Be Future Ready

IT Planet®

8

C<>deBot

Windows 10 with Office 2016

Davinder Singh Minhas

This book belongs to:

Name .....

Class ..... Section ..... Roll No. .....

School .....

PMP Planet® Multimedia Publishers
The Ultimate Resource

PM PUBLISHERS PVT. LTD.

IT PLANET - 8 (CodeBot)

Content Writer : Meenakshi Aneja

Web Software Developer : Akash

Editor : Gaurav Gupta

Trademarks

ISBN : 978-93-91185-22-0

First Edition : 2022

Printed at :

Published in India by :

PMP Planet® Multimedia Publishers
The Ultimate Resource

PM PUBLISHERS PVT. LTD.

C-55, Sector-65, NOIDA, Gautam Budh Nagar-201301 (U.P.), India

Ph.: 0120-4300130-33, Mob.: 9540990177

E-mail: info@pmpublishers.in

URL: www.pmpublishers.in

PREFACE

Technology is one of the biggest catalysts in transforming and improving education process while playing a vital role in the progress of a country. As we know, the world is changing at a fast pace and so is the technology. Hence, it is imperative for us to make our students match this pace, and also to help them inculcate futuristic skills and mindset.

To make students ready to face the uncertain challenges and to stay tuned with the unprecedented journey of technology, **National Education Policy 2020** has suggested certain skills that should be learnt by them. These skills will help them in becoming successful, innovative, adaptable, and productive human beings in the various fields such as **Digital Literacy**, **Coding**, **Computational Thinking** and **Artificial Intelligence** in the rapidly changing tech-savvy world.

Envisaging the same vision of National Education Policy 2020, we have created **CodeBot**, a comprehensive, exhaustive computer series for classes 1 to 8. This series is based on the latest software packages and operating system such as **Microsoft Office 2016** and **Windows 10**.

This series contains **five** sections:

- **Digital Literacy:** This section would discern students the use of computer technology in day-to-day life. It would also help them comprehend the computer subject as a tool, which can be **integrated** with other subjects.
- **Computational Thinking:** To inculcate the skills of problem-solving among the students, we have introduced Computational Thinking from class 1 to 5. It consists of interesting and engaging activities on Patterns, Decomposition, Abstraction, Algorithm, etc.
- **Coding Junction:** Having children learn coding at an early age helps them organize their thinking and express their ideas to create programs using the computer. It empowers them not only to use technology, but also to create it. Keeping this in mind, we have introduced interactive fun-based coding for all levels such as **Scratch Jr** and **Scratch** from class 2 to 5; **Python** with gamification and GUI-based coding and **MIT App Inventor** from class 6 to 8.
- **Artificial Intelligence (AI):** Knowledge of Artificial intelligence is becoming more and more important as the students have to be AI-ready for the present and future. Therefore, we have introduced AI from class 1 onwards in a fun and engaging manner.
- **Cyber Zone:** This section covers Internet literacy and throws light on issues such as **cybercrimes** and **cyber security**, thereby encouraging students to be good digital citizens.

To produce a visually appealing and easy to understand book, we have artfully combined the latest technologies, pictures, drawings and texts in this series. Most of the topics in this series show a **step-by-step pedagogy** which simplifies the complex computer concepts. The terms and examples described in this series are those which every student will encounter while using computers.

To make the chapters exciting, **topic-relevant projects** have been added that encourage the students to try out for themselves, and to instill in them the confidence before they embark on making their own project using a particular software. Each project in the chapter presents practical problems and their complete solution in an easy-to-understand approach.

In a Nutshell section summarizes the whole chapter and the **Self-Evaluation** section examines the students and their understanding of chapter-wise computer concepts. **Exercises** and **Activities** have been included at the end of every chapter to assess the level of understanding of students.

We welcome constructive suggestions and feedback to make this series more comprehensive, relevant, updated and useful both for the teachers and the learners. You may mail us at editor@pmpublishers.in.

AUTHOR

CONTENTS

1 Computer Network

OBJECTIVES

After completing this chapter, you will be able to:

- Understand about computer communication.
- Learn about computer network and its type.
- Learn about types of network hardware, communication channels and network architecture.
- Learn about topologies and protocols.

Communication

Communication is required by for people to share their views and opinions. It is a process in which two or more people share their knowledge, information, resources and expertise among themselves.

Communication involves a **sender** transmitting an idea, information, or feeling to a **receiver**. Effective communication occurs only if the receiver understands the exact information that the sender intends to give.

COMPUTER COMMUNICATION

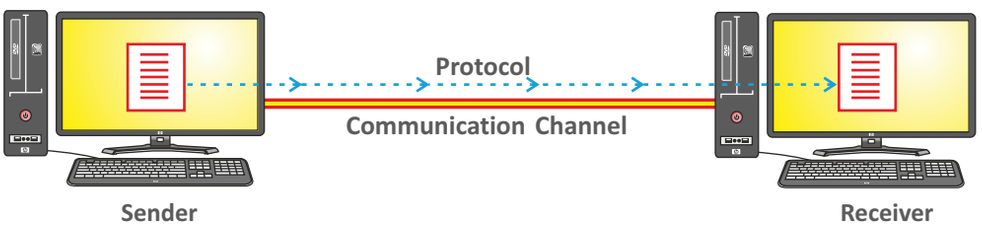
Computer communication is described as a process in which one computer transfers data, instructions, and information to another computer(s). Earlier, only large computers had communication capabilities. Today, even the smaller computers and devices can communicate directly with one another, with hundreds of computers on a company network, or with millions of other computers around the globe—often via **Internet**. Some communications involve cables and wires; others are sent wirelessly through the air. For successful computer communication, you need the following components.

SENDER: It is a **sending device** that initiates to send data, instructions or information. It can be a computer or mobile device.

COMMUNICATION CHANNEL OR TRANSMISSION MEDIA: It is a **medium** through which the data, instructions, or information can travel. It can be cables, microwave stations, or satellites.

RECEIVER: It is a **receiving device** that accepts the transmission of data, instructions, or information. It can be a computer or a mobile device.

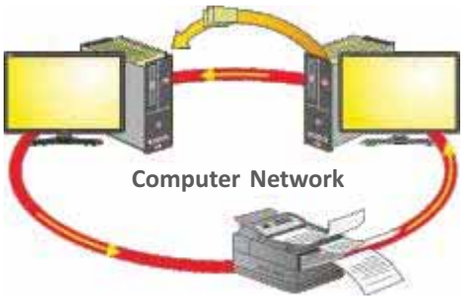
PROTOCOL: It is a set of **rules** that outlines characteristics of how two devices communicate. Without protocol, two devices may be connected, but cannot transfer or exchange any data. A protocol may define data format, coding schemes, and the sequence in which data transfers among devices. For example, a person who knows only English language cannot communicate with another who knows only Hindi language. For communication between two persons, the knowledge of same language is a must.



Computer Network

A **computer network** is a collection of computers and devices connected by communication channels. People connect computers to a network for a variety of reasons, including the ability to share hardware, software, data and information, and to facilitate communication.

A computer network can be as small as two computers connected to each other, or it may be spread over different parts of a city, or ever covering the whole world.



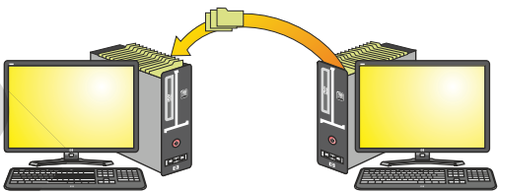
Computer Network

NEED FOR A NETWORK

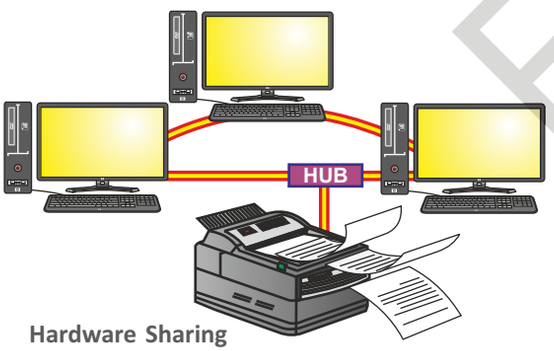
You can share resources such as hardware devices, software programs, data and information with the help of a network. Sharing resources saves time and money.

Data And Information Sharing

In a network environment, any authorized user can use a computer to access data and information stored on other computers in the network. A large company, for example, might store a database of customer information on the hard disk of the server. Any authorized person can connect to the network and can access this database. The capability of providing access, and storage of data and information on shared storage devices is an important feature of network.



Data and Information Sharing



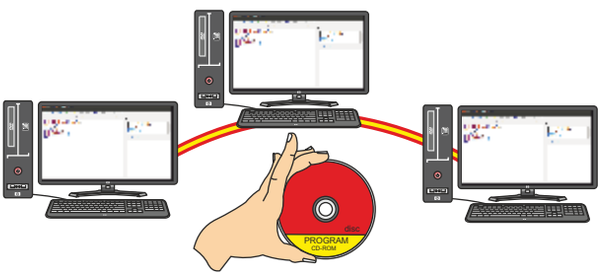
Hardware Sharing

Hardware Sharing

In a network environment, each computer can access and use hardware available on the network. Suppose, there are a number of personal computers on a network and each one needs to use a printer. If the personal computers and the printer are connected in a network, each personal computer user can access the printer over the network, whenever he or she needs it.

Software Sharing

Network lets people gain access to software programs stored on a central computer. Using their own computer, individuals can gain access to and work with these programs. By sharing a program, a company can avoid having, to install a copy of the program on each person's computer separately.



Software Sharing

Transfer Funds

Network allows users to exchange money from one bank account to another via Electronic Fund Transfer (EFT). Both business houses and consumers use EFT. Examples include use of credit and debit cards, direct deposit of funds into bank, online banking, and online bill payment.

NETWORK USER

When your computer is a part of a network, where two or more computers are connected using a cable or some other communication channel, you can become a **network user** and can share files, folders, and computer hardware such as printers attached from one computer to other computers. These commonly used resources are referred to as **local resources**.

SERVER AND WORKSTATIONS

Powerful computers responsible for distributing files to network users are referred to as **servers**. Other computers less powerful than servers and connected to a server are called **workstations**. Each workstation contributes equally in the network and is often called **peer**.

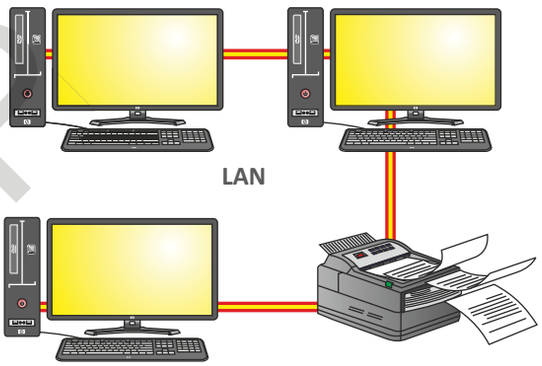
Types of Network

There are many types of network: Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN) and Personal Area Network (PAN). Each one of these is discussed below.

LAN (Local Area Network)

A **local area network (LAN)** is a network that connects the computers and the devices in a limited geographical area, such as home, school computer laboratory, office building or closely positioned group of buildings. These computers are usually within 100 to 300 meters away from each other.

If you have a home network with two or more computers, or if you are at your school where more than 20 computers are connected to each other, then you are on a LAN.



Each computer or device on the network is a **node**. Often, the nodes are connected to the LAN via cables. LAN can either work with cables and hubs or wirelessly. A Wireless Local Area Network is also known as **WLAN**.

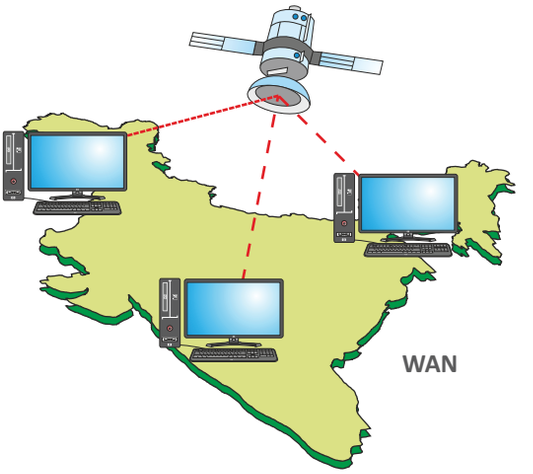
MAN (Metropolitan Area Network)

MAN is a network that connects the Local Area Networks in a metropolitan area such as a city or a town. A MAN typically includes one or more LANs but covers a smaller geographical area than a WAN. Telephone companies, cable television operators, and other organizations use MAN network.

MAN

WAN (Wide Area Network)

A **wide area network** (WAN) spans over a large geographical area, such as an entire city, region, or even an entire country or all over the world. Two or more LANs that are relatively far apart are typically connected by WAN so that users and computers in one location can communicate with users and computers in other distant locations. The **Internet** is the world's largest WAN.



PAN (Personal Area Network)

A **personal area network (PAN)** is a network that connects personal devices like laptop, smartphones, digital cameras, printers, etc. in an individual's workspace using wired or wireless technology. A PAN may connect devices through a router using network cables or by using **Bluetooth** or **Wi-Fi** technology. You can transfer files and songs from one device to another using PAN.

Network Hardware

Network hardware consists of physical devices used on a network. All networks need network hardware to function.

COMPUTER

The most important job of a network is to link computers together. When computers are linked, the people using them can work more efficiently. Computers connected to a network do not have to be of the same type. For example, a network could contain desktop computers, such as IBM-compatible and Macintosh or portable computers, such as notebooks and Tablet PCs.

NETWORK INTERFACE CARD (NIC)

An expansion card is used to provide network access to a computer or other device, such as a printer. Network interface cards mediate between the computer and the physical media such as cables over which data travels.

CONNECTOR

A connector is a device that joins two networks together. The most common connectors are:

HUB: A **hub** offers a central location where all the cables on a network meet. It allows you to connect multiple computers to a single network. It also provides a connection for all the computers on a network, so that they can exchange data. Many types of network structures now use hubs as the primary method of connecting computers.

SWITCH: A **switch** is a device that provides a central point for cables in a network. It receives data from many directions and then forwards it to one or more destinations. A switch is considered more advanced than a hub because switch sends the data to a device that needs or requests for it. Switches can be used in place of hubs.

ROUTER: A **router** is a device that connects multiple computers or devices together and transmits data to its correct destination on a network through a process known as **routing**. A router acts as a junction between two or more networks like LAN and MAN to transfer data packets among them. It is used to connect your home network (LAN) with the Internet (WAN).

CABLES

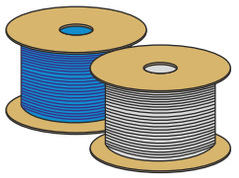
A network cable plugs into the NIC (Network Interface Card) at the back of each computer on the network. Information, shared files, and other network data travel through the network cables. A fiber metal or fiber-optic cable is used to connect computers and other devices on a network. These cables are insulated with special material such as plastic or PVC.

RESOURCE

Any part of a computer system or a network such as a disk drive, printer, or memory that can be allotted to a program or a process, while it is running, is a **resource.**

Communication Channels

All networks are linked to each other through communication channels. These are the medium on which the data, instructions, or information travel. When you send data from a computer or mobile device, the signal that carries the data may travel over various transmission media. Most commonly used media are **physical** and **wireless**.



PHYSICAL TRANSMISSION MEDIA

Physical transmission media use wire or cable to send communications signals. LANs often use physical transmission media. There are three main types of physical transmission media: twisted pair cable, coaxial cable and fiber optic cables.

Twisted Pair Cable

Twisted pair cable consists of one or more twisted-pair wires bundled together. Each twisted-pair wire consists of two separate insulated copper wires that are twisted together and is color-coded for identification. Landline phone networks and LANs often use twisted-pair cables.

Twisted Pair Cable

Coaxial Cable

Coaxial cable consists of a single copper wire surrounded by at least three layers. The first one is an insulating material, the second is a wire mesh, and the third is a plastic or PVC outer coating. On coaxial cables, data travels through a copper wire. Cable TV network wiring uses coaxial cables.

Coaxial Cable

Fiber-optic Cable

The core of a **fiber-optic cable** consists of hundreds of thin strands of glass or plastic that use light to transmit signals. Inside the fiber-optic cable, an insulating glass cladding and a protective coating surrounds each optical fiber. Many big companies use fiber-optic cables in high-traffic networks.

Fiber-optic Cable

WIRELESS TRANSMISSION MEDIA

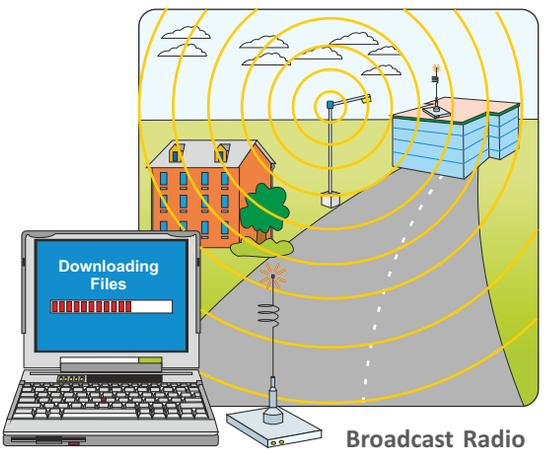
Wireless transmission media send communication signals through the air. Many people use this media because it is more convenient than installing cables. Types of wireless transmission media used in communication include infrared, broadcast radio, cellular radio, microwaves, and communication satellites.

Infrared (IR)

Infrared (IR) is a wireless transmission medium that sends signals using infrared light waves. Infrared systems use the same technology as household remote controls. They are also used with computers and devices like cordless keyboards and mouses.

Broadcast Radio

Broadcast radio is a wireless transmission medium that distributes radio signals through the air over long distances, such as between cities, regions, and countries, and short distances, such as within an office or home. Bluetooth and Wi-Fi communication technologies use broadcast radio signals.



Broadcast Radio

Wi-Fi

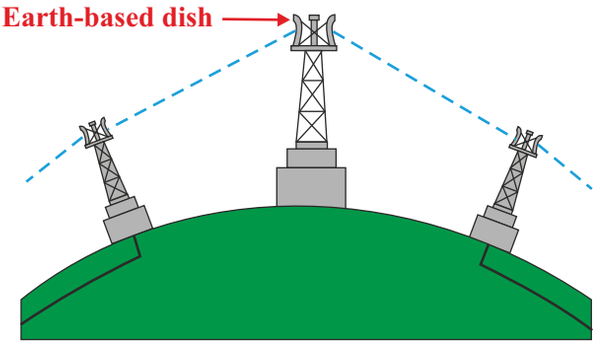
Wi-Fi, short for **wireless fidelity**, is a popular wireless networking technology that uses radio waves to provide wireless high-speed network connections.

Cellular Radio

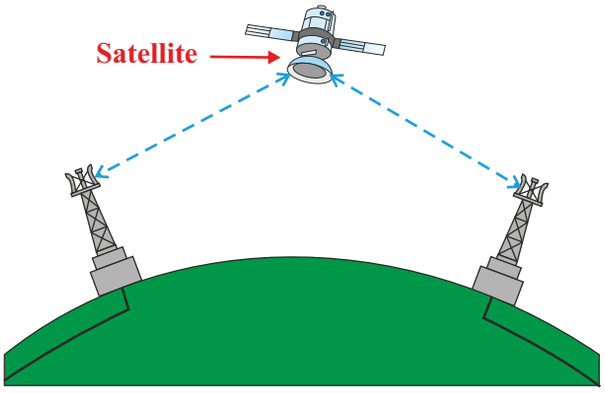
Cellular radio is a wireless transmission medium that is used for mobile communication. It is a form of broadcast radio. Several categories of cellular radio transmissions exist, such as 1G (first generation of cellular transmissions), 2G, 3G, 4G and 5G.

Microwave

Microwaves provide a high-speed wireless signal transmission. It involves sending signals from one microwave station to another. A microwave station is an earth-based dish that contains the antenna and other equipment necessary to conduct microwave communication. Microwave transmission is used in wide-open areas, such as deserts, forests or lakes.



Microwave



Communication Satellite

Communication Satellite

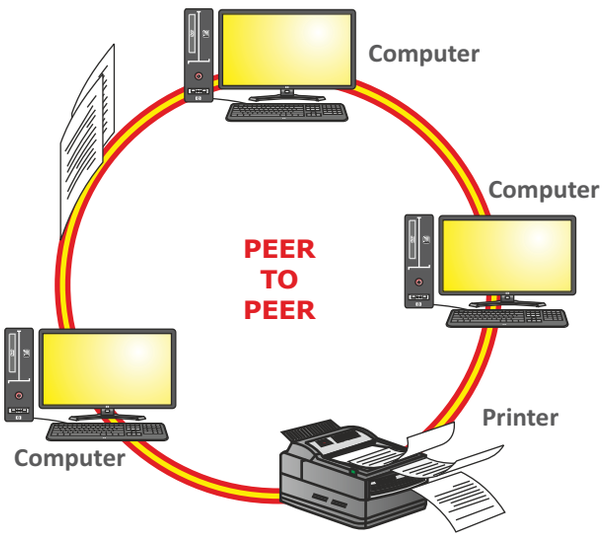
A **communication satellite** is a space station that receives microwave signals from an earth-based station, amplifies (strengthens) the signals, and broadcasts the signals back over a wide area to any number of earth-based stations. Applications such as television and radio broadcasts, weather forecasting, videoconferencing, GPS, and Internet connections use communication satellites.

Network Architecture

Network architecture refers to how computers are organised and how tasks are allocated among these computers. It is mainly categorized into two major types.

PEER-TO-PEER NETWORK

A network of two or more computers that uses the same type of programs to communicate and share data is called a **Peer-to-Peer network.** Each computer or peer is considered equal in terms of responsibilities, and each acts as a server to others in the network. Peer-to-Peer networks work best in a small environment. These networks are designed primarily for small to medium local area networks. Peer-to-Peer network is not effective if more than ten computers are to be connected together.



CLIENT/SERVER NETWORK

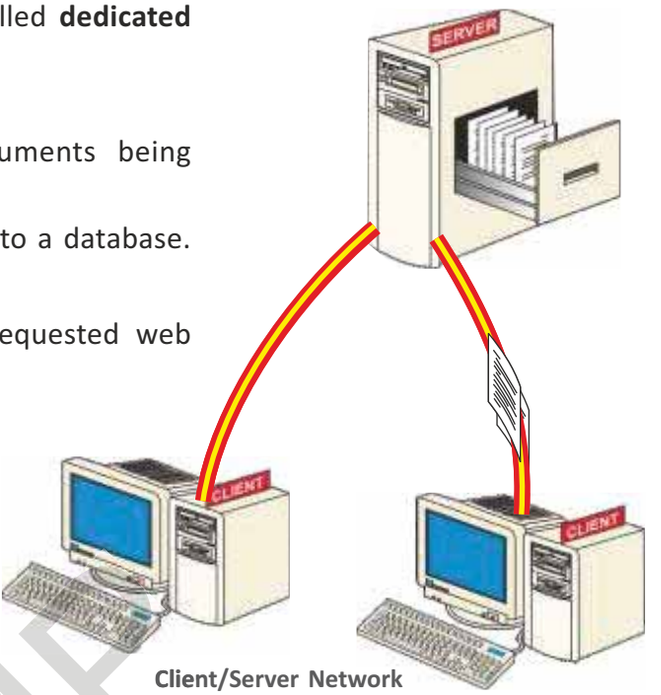
A network in which one or more computers are designated as **server(s)**, and the other computers on the network, called **clients**, can request services from the server, is known as **Client/Server network**.

Server

A **server**, sometimes called the **host computer**, controls access to the hardware and software on the network and provides a centralized storage area for programs, data, and information. When a user connects to the server, then applications, files, printers, etc. become available.

Some servers perform a specific task and are called **dedicated** servers.

- A **file server** stores and manages files.
- A **print server** manages printers and documents being printed.
- A **database server** stores and provides access to a database.
- A **network server** manages network traffic.
- A **web server** is a computer that delivers requested web pages to your computer.



Client/Server Network

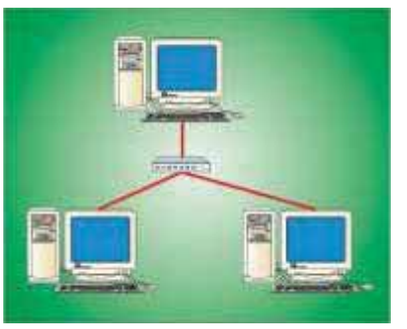
Client

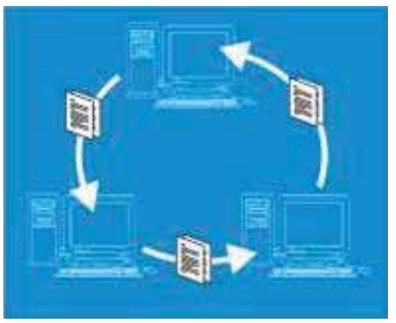
A **client** is a computer system that relies on a server for all the resources. For example, a server might store a network version of word processing program. Every client on the network can access the word processing program on the server.

Network Topology

In networking, the term **topology** refers to the layout structure of connected computers and devices on a network. A network topology has two levels, i.e., **physical** and **logical**.

The **physical** level refers to the parts of a network that physically exist, such as computers, cables and connectors. This level specifies where the computers on a network are located and how all the parts of the network are connected. Cables are the most popular transmission media to transfer information on a network.


PHYSICAL

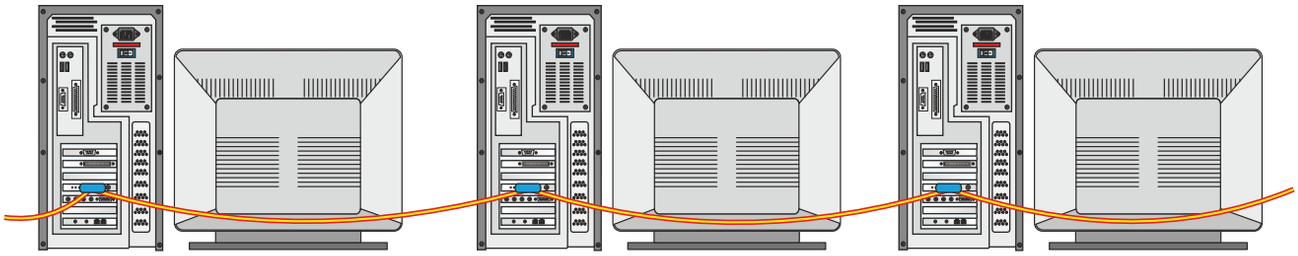

LOGICAL

The **logical** level refers to the path that the information takes to reach its destination on a network. The logical level of a network depends on many factors, such as the applications used and the volume of information transferred over the network. Computers share information by exchanging electrical signals. Signals are sent via the transmission medium that connects the computers.

Bus, **star** and **ring** are the main types of network topologies.

BUS TOPOLOGY

In this kind of topology, all the computers and their devices are connected to one single cable called the **bus**. This network is also called **linear network**. It transmits data, instructions and information in both directions.

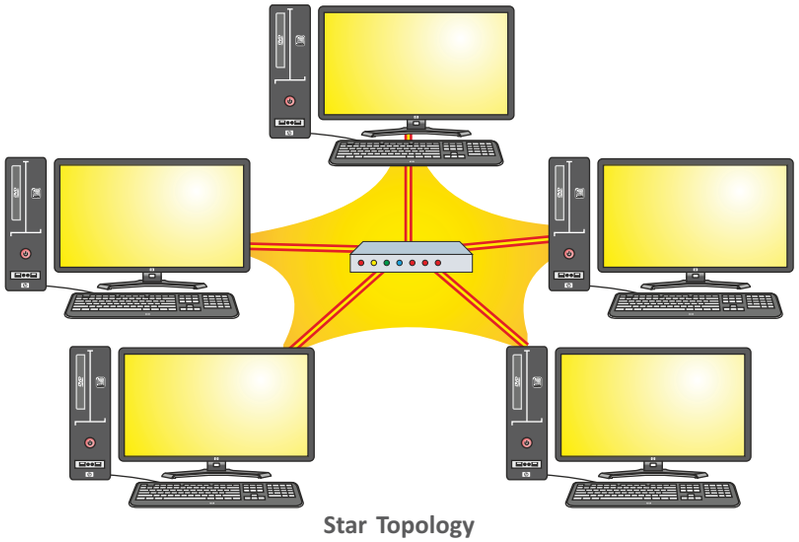


Only one computer can communicate at a time in bus topology. A device, wanting to communicate with another device on the network, sends a broadcast message onto the wire that all other devices can see, but only the intended recipient accepts and processes the message.

In this topology, computer system can be easily added or removed from the network. The failure of a single node does not affect the performance of the remaining network.

STAR TOPOLOGY

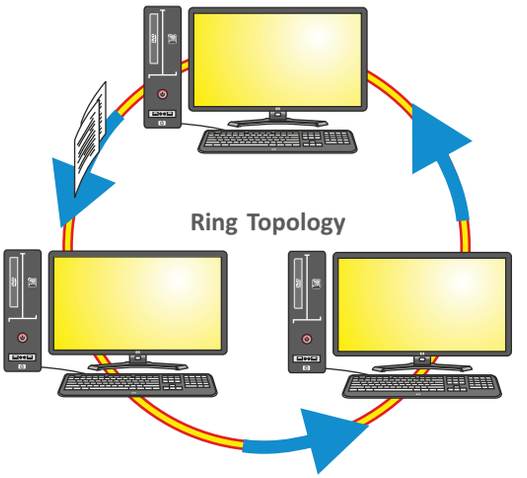
In this kind of topology, connector called a **hub** is placed at the center to which all the other nodes are connected. All the information that is transferred from one computer to another on the network passes via the hub. Star network is one of the most common computer network topologies because it is easy to add or remove nodes. A failure in any star network cable will only take down network access of one computer and not the entire network. However, when the hub fails, then the network also fails.



Star Topology

RING TOPOLOGY

In **ring** topology, nodes are connected in a circular chain in which each node is connected to the next one and the last node is connected to the first one. Every device has exactly two neighbours for communication purpose. All messages travel through a ring in the same direction (either clockwise or counter clockwise).



In this, if one node fails, the whole network goes off. Computers are usually located close together. A ring network is easy to set up because the computers are attached to a single ring of cable and no central connector, such as hub, is required. There is no beginning or end in a ring network.

Protocol

A **protocol** is a set of rules that outlines characteristics of how two devices communicate over the network. There are different protocols for different operations on the Internet.

HTTP (Hypertext Transfer Protocol): This is a set of rules that defines how pages transfer on the Internet and what actions web servers and browsers should take in response to various commands. Many web addresses begin with **http://** as the protocol.

FTP (File Transfer Protocol): This is a set of rules that allows file uploading to and downloading from other computers on the Internet. **Uploading** is the process of transferring files from your computer to a server on the Internet. **Downloading** is the process of transferring files from a server on the Internet to your computer. Web page developers often use FTP to upload their web pages to a web server.

TCP/IP (Transmission Control Protocol/Internet Protocol): This is a network protocol that defines how the information or messages are routed from one end of a network to the other, ensuring the data arrives correctly. It has been used as network standard for Internet communications.

POP3 (Post Office Protocol version 3): This is an email protocol that stores email messages on a mail server and allows the user to view, access and manipulate the message after downloading or storing it on their computer. Once the messages are downloaded onto your computer, they are deleted from the mail server. This means that after the email is downloaded, it can only be accessed using the same computer. If you try to access your emails from a different device, the messages that have been previously downloaded will not be available to you.

IMAP (Internet Message Access Protocol): This is also an email protocol that stores email messages on a mail server and allows the user to view, access and manipulate the messages on the mail server from their computer. When you read an email message using IMAP, you are not actually downloading or storing it on your computer; instead, you are reading it on the mail server from your computer. As a result, if you try to access your emails from a different device, the same messages will be available to you.

SMTP (Simple Mail Transfer Protocol): This is an email protocol for sending email messages across the Internet. SMTP was originally developed in the early 1980s and remains one of the most popular protocols in use worldwide. Most email software programs use SMTP for sending mails and use either the POP3 or IMAP protocol for receiving mails.

Self-Evaluation

After reading the chapter, I know these points:

	CHECKLIST	
	Agree	Disagree
⊙ I know that computer communication is described as a process in which one computer transfers the data, instructions, and information to another computer(s).	☐	☐
⊙ I know that a network is a collection of computers and devices connected by communication channels.	☐	☐
⊙ I know that there are many types of networks: Local Area Network, Metropolitan Area Network, Wide Area Network and Personal Area Network.	☐	☐
⊙ I know that communication channel is a medium on which the data, instructions, or information can travel.	☐	☐
⊙ I know that network architecture is mainly catogorized into two major types– Peer-to-Peer network and Client/Server network.	☐	☐
⊙ I know that network topology has two levels– Physical and Logical.	☐	☐
⊙ I know that there are different protocols used for different operations on the Internet such as HTTP, FTP, SMTP, etc.	☐	☐

Exercises

A. Tick [✓] the correct answer.

1. Computer network is a collection of computers and devices connected by ..... channels.
   a. internal ☐ b. communication ☐ c. external ☐
2. The computer connected to the server is called ..... .
   a. host ☐ b. workstation ☐ c. workgroup ☐
3. ..... provide a high-speed wireless signal transmission.
   a. Infrarays ☐ b. Cellular networks ☐ c. Microwaves ☐
4. ..... network is designed primarily for small to medium local area networks.
   a. Client ☐ b. Peer-to-Peer ☐ c. Server ☐
5. ..... server manages printers and documents being printed on network.
   a. Print ☐ b. Web ☐ c. Mail ☐
6. In ..... topology, nodes are connected in a circular chain.
   a. Ring ☐ b. Star ☐ c. Bus ☐

B. Write 'T' for True and 'F' for False statements.

1. Each computer on a network cannot access hardware available on the network. ☐
2. We can transfer songs from one device to another using PAN. ☐
3. Landline phone networks and LANs often use twisted-pair cable. ☐
4. A client is sometimes called the host computer. ☐
5. A Peer-to-Peer network works best in a large working environment. ☐
6. SMTP is an email protocol for sending messages across the Internet. ☐

C. Fill in the blanks.

1. A ..... is a collection of computers and devices connected by communication channels.
2. A ..... is a device that provides a central point for cables in a network.
3. ..... transmission media use wire or cable to send communication signals.
4. Many big companies use ..... cables in high-traffic networks.
5. Some servers perform a specific task and are called ..... servers.
6. A ..... is a computer system that relies on a server for all the resources.

D. Define the following.

1. Protocol: .....

   .....

2. Router: .....

   .....

3. FTP : .....

   .....

E. Differentiate between the following.

1. Hub	Switch
.....	.....
.....	.....
.....	.....
2. Twisted Pair Cable	Coaxial Cable
.....	.....
.....	.....
.....	.....
3. Star Topology	Ring Topology
.....	.....
.....	.....
.....	.....
4. POP3	IMAP
.....	.....
.....	.....
.....	.....

F. Answer in 1-2 sentences.

1. What is a computer network?

   .....

   .....

2. What are network communication channels?

.....

.....

3. Name the different types of wireless transmission media.

.....

.....

4. What is network topology?

.....

.....

G. Answer briefly.

1. What are the basic requirements for computer communication?

.....

.....

.....

.....

2. What are the different types of networks?

.....

.....

.....

.....

3. What are the different types of network architecture?

.....

.....

.....

.....

H. Application-based Question

Two students, A and B, are working on separate computers in the school computer lab. A wants to see a file created by B on his computer. Can A access the computer of B? If yes, tell him which network he can use for this purpose.

.....

Group Discussion

Divide the students into groups and discuss about the various protocols in a network.

Online Link

To learn more about working of computer network, visit the website:

https://www.javatpoint.com/types-of-computer-network

Activity Section

Lab Activity

Make a presentation on Computer Network.

Follow these instructions:

a. Make a folder **'Lab Activity'** in any drive.

b. Make a presentation consists of five slides which will include Introduction slide, Network Types, Network Topology, Communication Channels and Protocols.

c. Apply different slide transition and animation effects on the slides.

d. Save the presentation as **'Computer Network'** in the main folder **'Lab Activity'** and run it.

Skill Formation

- This activity enhances the organizational and presentation skills of the students.

Discover More

GPS (Global Positioning System)

GPS is a navigation system that consists of one or more earth-based receivers that accept and analyze signals sent by satellites in order to determine the receiver's geographic location. Many mobile devices, such as smartphones, have GPS capability built into the device. Some users carry a handheld GPS receiver; others fix a receiver inside the car, airplane, or a computer or mobile device. A GPS receiver is a handheld, mountable, or embedded device that contains an antenna, a radio receiver, and a processor. They generally include a screen display that shows an individual's location on the map.

Technology Trailblazers

Tim Cook

CEO: Apple | **YEAR: 2011**

Tim Cook is the CEO of Apple Inc. and serves on its Board of Directors. He is a logistical mastermind with an ability to recollect facts and figures, which led Apple climb up the profit charts to record levels.

Tim was born in the small town of Robertsdale, Alabama, on November 1, 1960. He graduated from Auburn University with a Bachelor's degree in Industrial Engineering and earned an MBA from Duke University. Following a 12-year career at IBM, Tim Cook went on to executive roles at Intelligent Electronics and Compaq, before joining Apple in 1998. In August 2011, Cook was named Apple's new CEO, prior to the death of his predecessor Steve Jobs.

2 Access – Creating a Database

OBJECTIVES

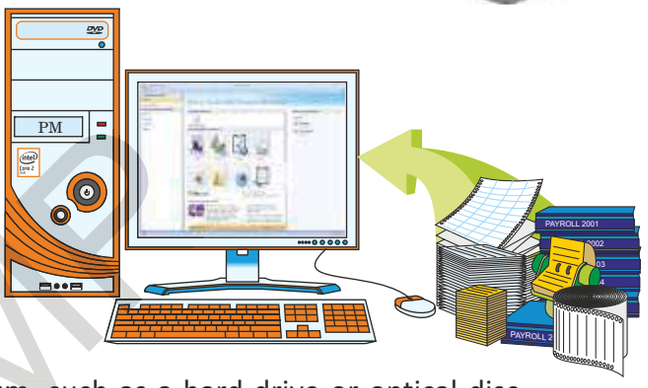
After completing this chapter, you will be able to:

- Understand about database and components of MS Access.
- Learn the steps to create database and tables.
- Understand field properties.
- Add records to the table.

Database

A **database** is a collection of data organized in a manner that allows easy access, retrieval, and use of that data.

In a manual database, you might record data on paper and store it in a filing cabinet. Database software is a software that allows you to create, access, and manage a database on a computer.



The computer stores the data on a storage medium, such as a hard drive or optical disc.

Microsoft Access

Microsoft Access is a **R**elational **D**ata**b**ase **M**anagement **S**ystem **(RDBMS)** that allows you to create, manage, and process data in the form of multiple tables. Each specific piece of information in a table is known as **value**. A value is located at the intersection of row and column.

COMPONENTS OF ACCESS

Tables, Records, and Fields: In MS-Access, a database consists of a collection of **tables** organized in rows and columns. A **record** is a row in a table that contains information about a given person, product, or an event. A **field** is a column in a table that contains a specific piece of information within a record.

Datasheet and Forms: Each table appears as a spreadsheet grid called **datasheet**. You can type directly into a datasheet. You can create **forms**, which are like dialog boxes that prompt for field entries, to make data entry more convenient.

Filter and Queries: You can **filter** a table to show only desired records and fields. You can also create a **query**, which is like a saved filter. Queries also enable you to combine data from multiple related tables into a single datasheet of results.

Reports: They present data from tables and queries in an attractive format, complete with titles, headers, footers, and graphics.

Starting Access 2016

You can start Microsoft Access 2016 to create or open a database file.

1. Click on **Start** icon to open Start menu *(or press ⊞)*.

A list of all installed Apps appears on the left of Start menu.

2. Scroll down and click on **Access 2016**.

Access start screen appears.

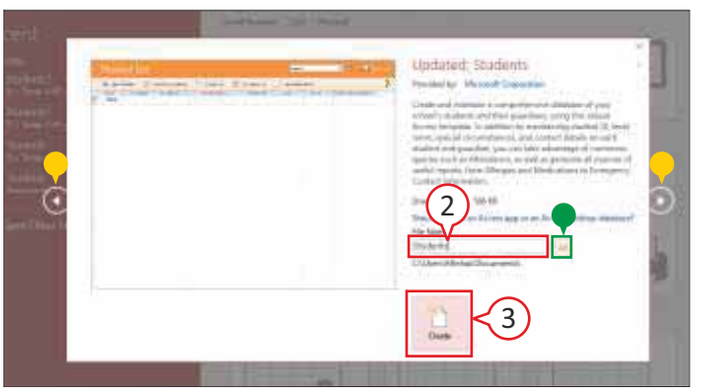
Now you can create a new database or open an existing database.

CREATING A DATABASE USING TEMPLATE

You can create a new database using a template which includes pre-built tables and forms that you can use to fill your own data very easily.

1. Click on any template to select.

A window appears, displaying the template information.



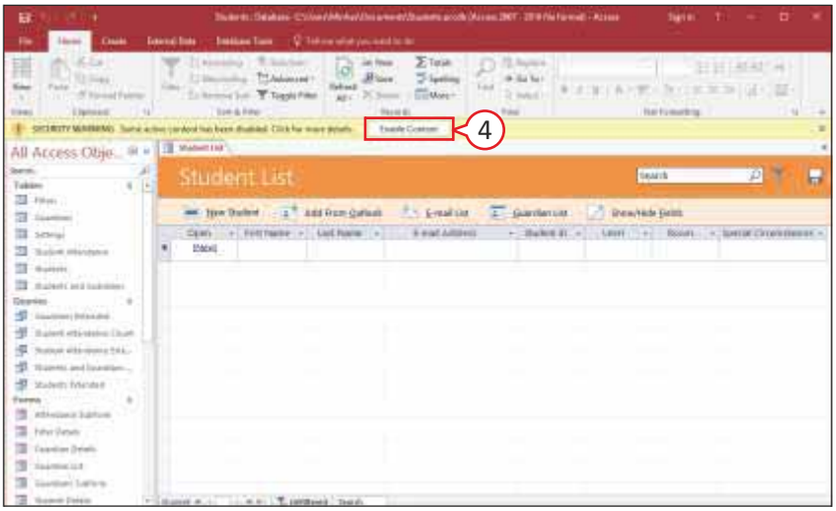
- To view the previous or next template, click on side arrows.

2. Type a name for the database (Students) in **File Name** field.

*Access automatically assigns the **.accdb** (Access Database) extension to all database files.*

- You can click on the **Browse** button to find the folder or drive where you want to store the new file.

3. Click on **Create**.



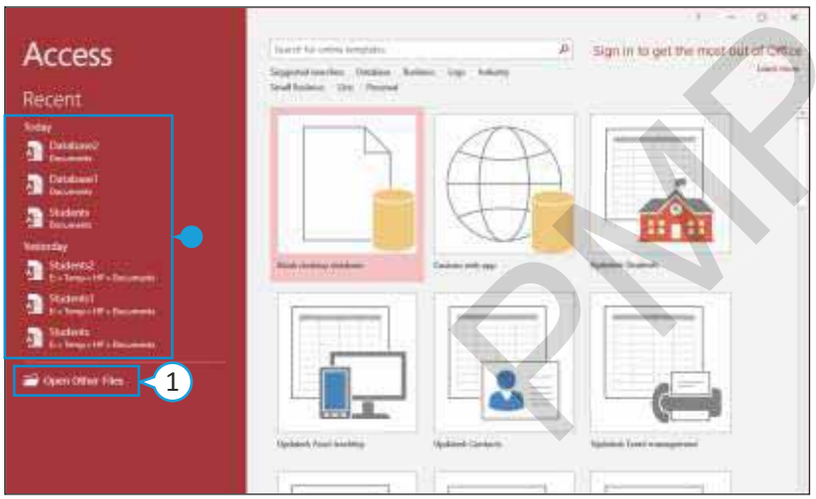
Access prepares a new database, and a new table is ready for data.

4. A **SECURITY WARNING** appears; to hide the warning and enable the macros in this template, click **Enable Content**.

You can now fill the table by entering records in it.

OPENING A DATABASE FILE

You can open a database file that you had created previously to continue entering data into it or analyzing its data.

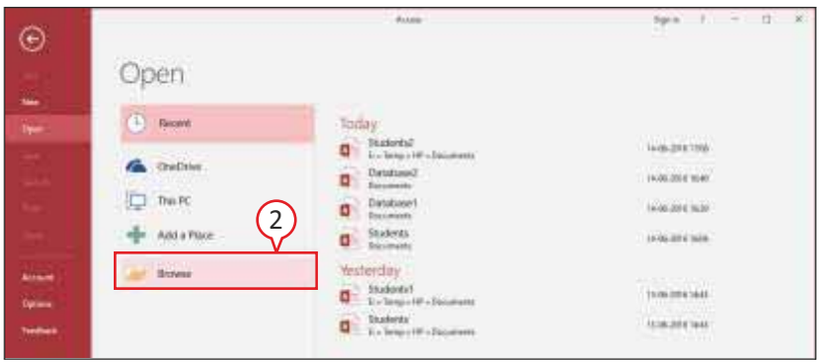


- In Access Start screen, by default, recently opened files are displayed. If you see the file you want to open, you can click it to open and skip the rest of these steps.

1. Click on **Open Other Files** *(or press Ctrl+O)*.

If some database is already open and you want to open another database, then click on **File** tab. The Backstage View appears. Click on **Open**.

The Backstage View appears.

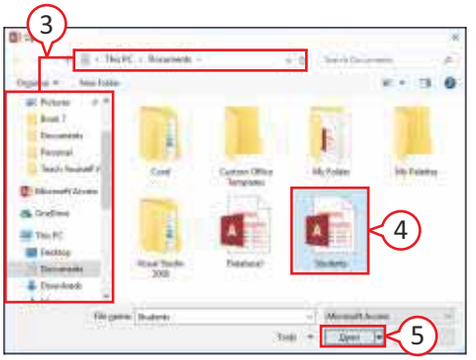


2. Click on **Browse**.

The **Open** dialog box appears.

Update Your Knowledge

Microsoft Access is a part of the Microsoft Office Suite. It does not come with all versions of Microsoft Office. So, if you specifically want Microsoft Access, make sure the Office Suite you are purchasing has it.



3. Navigate to a different location, if required.
4. Click on the name of the file that you want to open.
5. Click on **Open**.

- A **SECURITY WARNING** appears.

6. Click on **Enable Content** to hide the warning.

The database file opens.

Project: Dance Class Database

Start

Field Name	*Data Type*	*Description*
Student_ID	Number	Identification of the student
Name	Short Text	Name of the student
Class	Short Text	Class of the student
Dance	Short Text	Type of dance which student will learn
Transportation	Short Text	Mode of transportation for the student
Fees	Number	Fees of the student

Part-1: Table Structure

Skill Formation

This project enhances the data management skills of the students.

Students Detail

Student_ID	Name	Class	Dance	Transportation	Fees	Click to Add
101	Rupali	8th	Bharatnatyam	School Bus	3000	
102	Sonam	7th	Kathak	Private Van	2500	
103	Rahul	8th	Salsa	School Bus	3000	
104	Pinki	8th	Salsa	Walker	2500	
105	Kamal	7th	Hip-Hop	Private Van	2500	
106	Manav	8th	Jazz	School Bus	3000	
107	Praveen	8th	Kathak	Private Van	2500	
108	Kavita	8th	Bharatnatyam	School Bus	3000	
109	Sonali	8th	Kathak	Private Van	2500	
110	Ravi	7th	Break Dance	School Bus	3000	
0					0	

Part-2: Students Detail Table

Part-3: Final Report

This project contains a database called 'Dance Class', a table named 'Students Detail' created in Design view and finally a report of Table.

Creating a Blank Database

You can create a new database and fill data in it. Access prompts you to assign a name to the file when you create a new database file.

1. Click on the **Blank desktop database**.

A window appears, displaying the information about blank template.

2. Type a name for the database (Dance Class) in the **File Name** field.
   - You can click on the **Browse** button to find the folder or drive where you want to store the database.
3. Click on **Create**.

Access creates a new database and opens a new blank table named Table1.

- Now you can create your own table by entering records in it.
- *The Navigation pane displays database objects that you create, such as tables, forms, queries, and reports.*

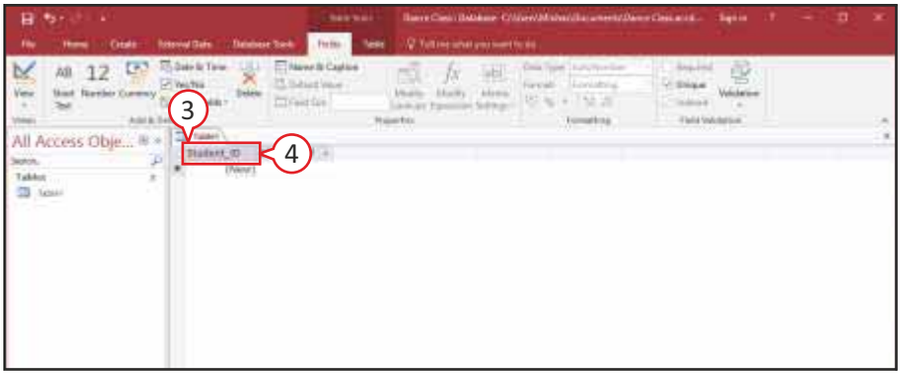
Creating a New Table

In Access, you can create tables in two views, **datasheet view** and **design view**.

USING DATASHEET VIEW

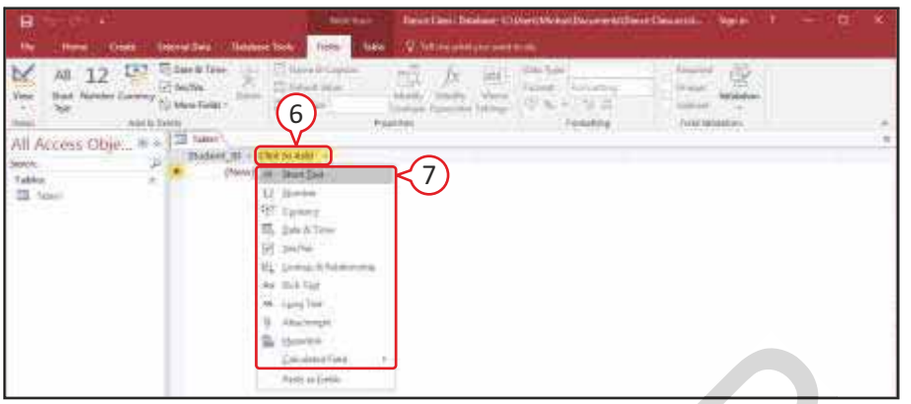
Datasheet view is useful when you need to create a table quickly consisting of few fields. In this view, Access assigns general names to the fields, such as **Field1**, **Field2**, and so on. You can create a table by adding new fields simply by typing the field names into the column-heading placeholders.

1. Open a Database file and click on **Create** tab.
2. Click on **Table**.



*Access opens a new table (Table1) in **Datasheet** view.*

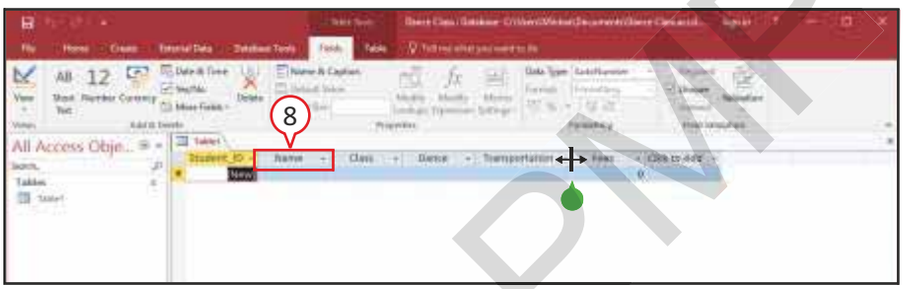
3. Double-click the column header to create a field name.
4. Type a name *(Student_ID)* for the field.
5. Press **Enter** key.



6. Click on next column.

Data Type menu appears.

7. Select the data type for the field. For example, select **Short Text** if you want to add Name field.



8. Type a name for the field.
9. Repeat steps **6** to **8** to create more fields for the table.

- You can resize a column by dragging column border left or right.

USING DESIGN VIEW

You can also make your table in **Design view** for greater control on its structure. You can describe the structure of the table before creating it. Here, you enter your own field names and descriptions, and choose your own data type to associate with each field.

In Design view, the window is divided into two panes: **upper pane** for creating field name, specifying data types, and entering field descriptions and **lower pane** for specifying field properties. For each field, you need to specify the following:

FIELD NAME: There must be a unique name for each field in the table. For example, in the Students' Detail table, the field names are Student_ID, Name, Class, Transportation, and Fees.

DATA TYPE: Each field has a data type that defines what you can store in it. Data entry is restricted to valid entries for the type you choose. For example, you cannot enter letters in a field set to **Number**.

DESCRIPTION: You can enter detailed description of all the fields within the table.

The following are the available data types in Access 2016.

Short Text:	This is a general-purpose field containing any data. It has a limit of 255 characters and cannot be used for numeric calculations. Use this type for numeric entries that will not have calculations performed on them, such as telephone numbers and ZIP codes.
Long Text:	This type has a limit of 63,999 characters; it is used for detailed, descriptive fields.
Number:	This type stores numeric data that you can use in calculations.
Date/Time:	This type only stores numbers representing valid dates and time.
Currency:	It stores currency data that you can use in calculations.
AutoNumber:	It stores a sequential number for each record.
Yes/No:	The value -1 represents **Yes** and the value 0 represents **No**, but the field can be formatted to display values as True/False or Yes/No.
OLE Object:	It stores objects created in another application such as Word or Excel that you can link to or fix in an Access table.
Hyperlink:	You can link to websites, e-mail addresses, files on your computer, files on the LAN or virtually any other location.
Attachment:	You can attach data files from word processing programs, spreadsheets, graphic editing programs and so on.
Calculated:	You can use it to create calculated fields directly in a table. In the earlier versions, you could create calculated fields only in queries.
Lookup Wizard:	Depending on the usage, this type creates either a lookup list from the data that you specify or a lookup list from the values in another table. It can also be used to set up multivalued lists.

The Table1 window appears in a Design view.

1. Open the database file and click on **Create** tab.
2. Click on **Table Design**.

Define the fields by choosing the required details in the table window to proceed to the next step in creating the table.

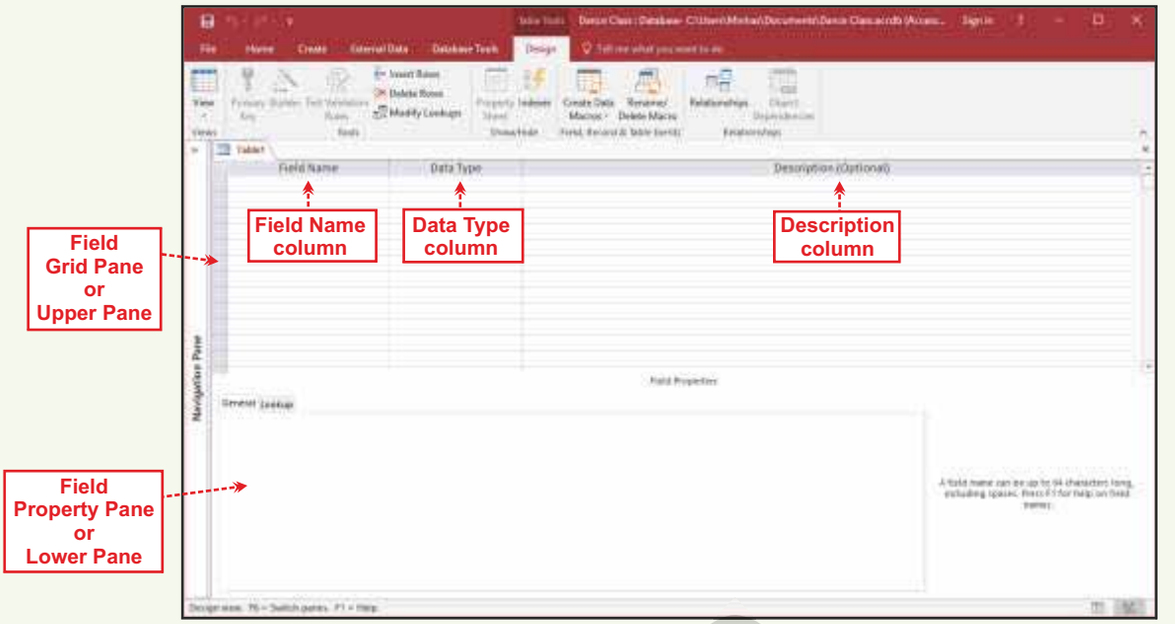
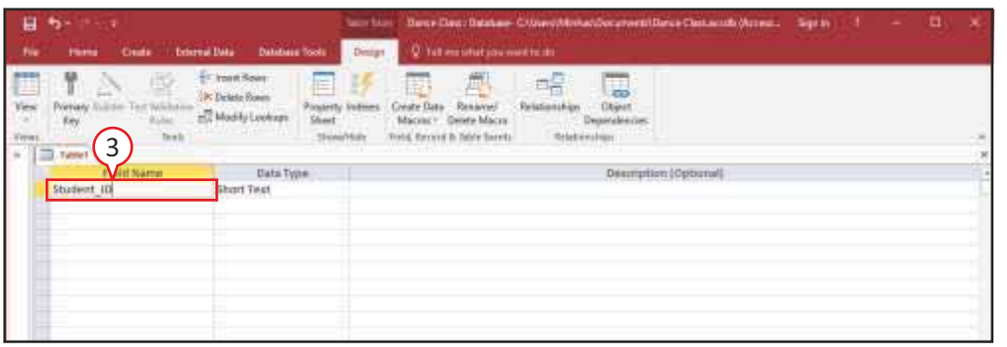


Table1 in Design View

The Table Design view window consists of two areas: **Field Grid Pane**, in which fields are created and **Field Property Pane** in which field properties are specified.

You should make entries in the **Field Name**, **Data Type** and **Description** columns, and then enter additional information in the **Field Property** box in the lower portion of the Table window.

Press the F6 key to move from the **upper pane** (the one where you define the fields,) to the **lower pane**, (the one where you define field properties). You should enter the appropriate field size and then press the F6 key to return to the upper pane.

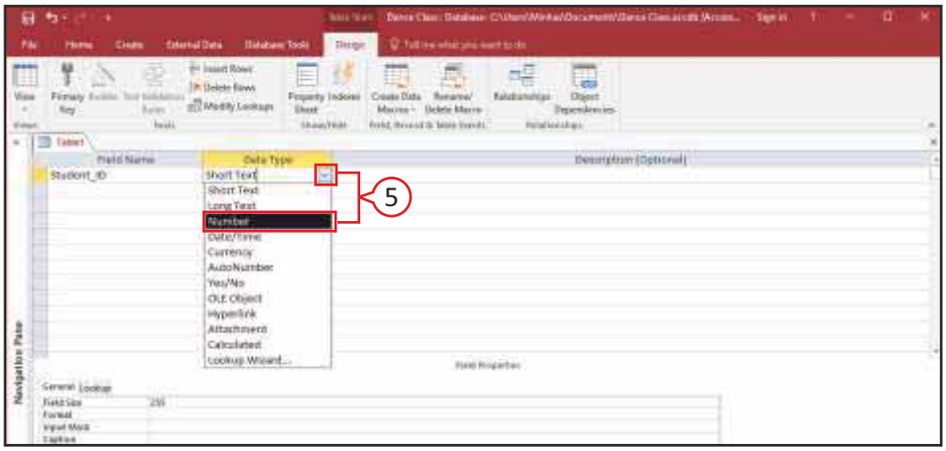


3. Type **Student_ID** (the name of the first field) in the **Field Name** column.
4. Press the **Tab** key to bring the insertion point to **Data Type** column.

*The word Student_ID is displayed in the Field Name column, and the insertion point advances to the Data Type column, indicating that you can enter the data type. The word **Short Text**, one of the possible data types, is currently displayed.*

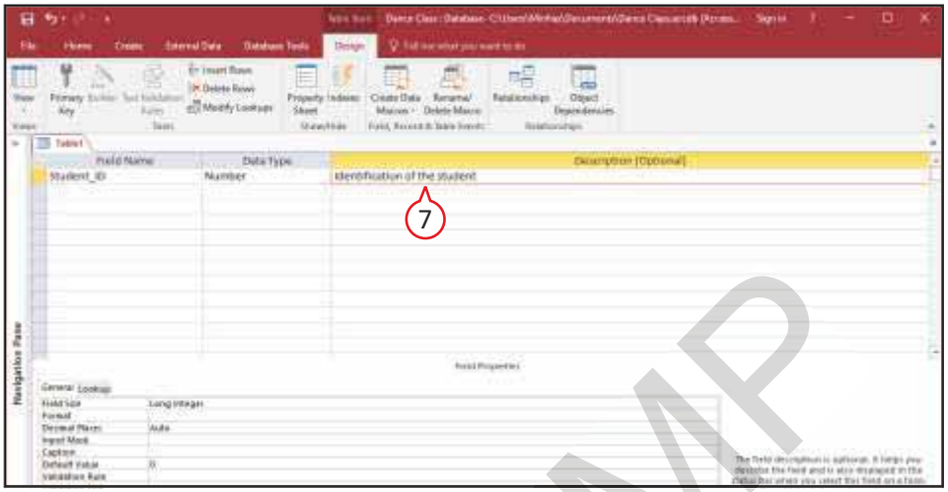
Update Your Knowledge

In Table Design view window, you can create whatever fields you like and select the data type of each field.



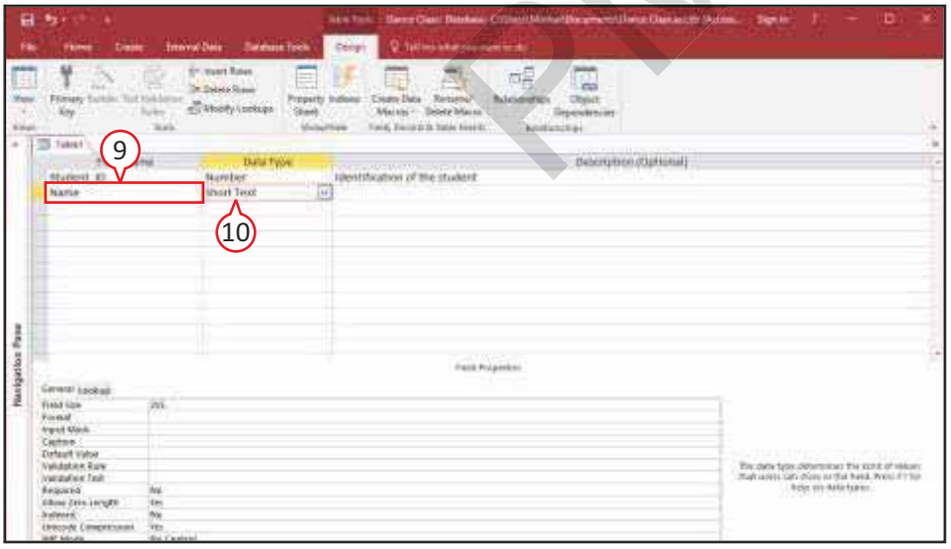
5. If you want to change the data type, click on the arrow button and change it according to your need.

After selecting the data type, its properties will be displayed in the lower pane.



6. After selecting the Data type, press the **Tab** key to move the insertion point to the **Description** column.
7. Type your text in the Description column.

Description is optional. You can directly move to the Field Name column to enter next field name.

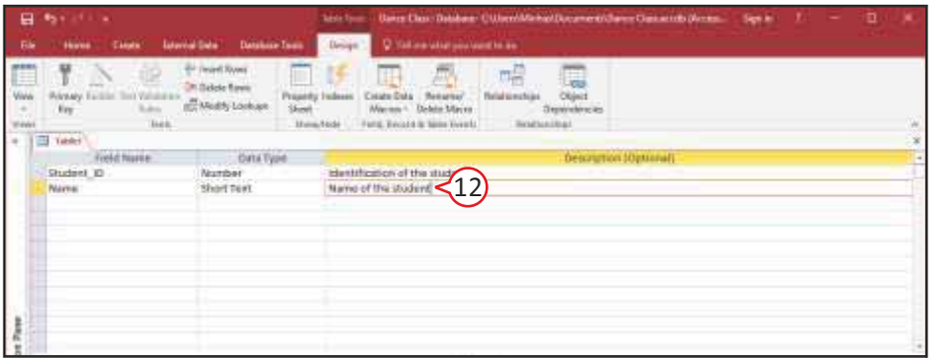


8. Press the **Tab** key again to move to the **Field Name** column in the second row.
9. Type the text (Name) in **Field Name** column.
10. Press the **Tab** key to move to the **Data Type** column.

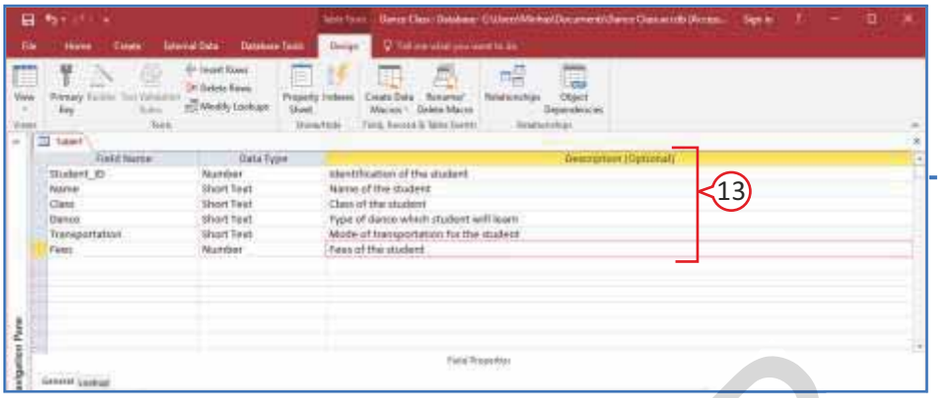
The datatype 'Short Text' is currently displayed in that field.

Shortcut Commands to Manage Database

Ctrl + N	Create new database	**Ctrl + P**	Print the current or selected object
Ctrl + O	Open existing database	**Ctrl + S**	Save a database object
Alt + F4	Quit from MS-Access		



11. Press the **Tab** key to move the insertion point to the **Description** column, if you want the Data Type to remain as **Short Text**.
12. Type the text for the **Description** column.



13. Repeat steps **8** to **12** to make the remaining entries in the table to complete it.

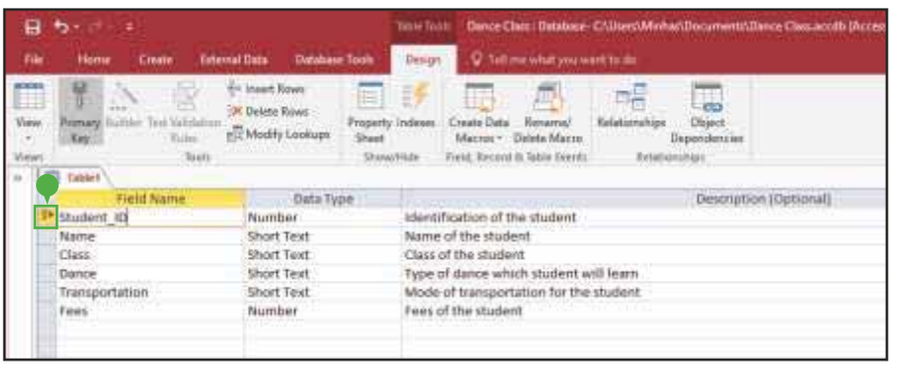
As per the project, part-1: table structure is now complete.

SETTING A PRIMARY KEY

A **primary key** is a key that differentiates the records in a file. The data stored in the key field is unique to a specific record. In each new table that you create, you have to set one field as the primary key. Access uses this key to relate records of this table to those of another table.

A student record, for example, would use Roll Number as a key field because it uniquely identifies each student.

1. Select the field name that you want to set as the primary key.
2. Click on the **Primary Key** from the **Tools** group.



- The field will be set as the primary key, indicated by a small key symbol to the left of the field.

The primary key is an on/off toggle. To remove it, select the primary key field and click on the **Primary Key** again.

Understanding Field Properties

Each field has a set of properties that defines and controls it. These properties include defining its size and format, as well as rules for entries in it.

Properties Pane: When a field is selected in design view, its properties appear in this lower pane.

General tab: The General tab contains most of the properties you will work with.

Lookup tab: The Lookup tab is primarily used for setting up lookup lists.

Drop-down list: Some properties have drop-down lists from which you can select the option.

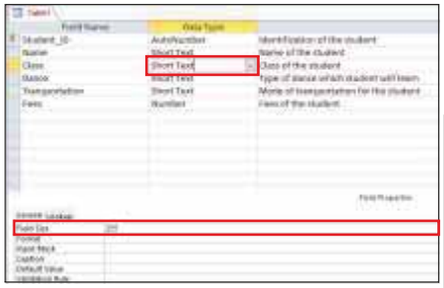
Property Information: When the insertion point is in a property box, information about that property appears here.

Yes/No properties: Some properties represent Yes/No questions which have already been filled for you with default values.

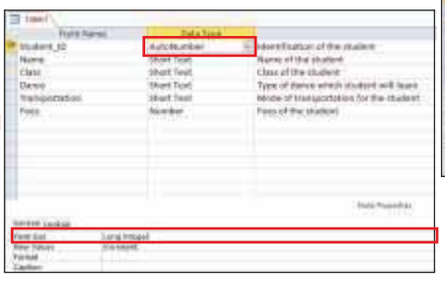
CHANGE THE FIELD SIZE

Each field has a size that limits the amount of data you can store in it. There are different ways of expressing the field size depending on the type of field.

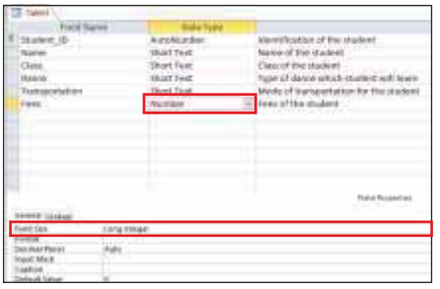
Field Type	Field Size	Meaning
Short Text	255	You can specify any number of characters from 0 to 255.
Number	Long Integer	Byte, Integer, Long Integer, Single, Double, Replication ID, and Decimal
AutoNumber	Long Integer	The same as Number, except that there are only two choices: Long Integer or Replication ID



Short Text



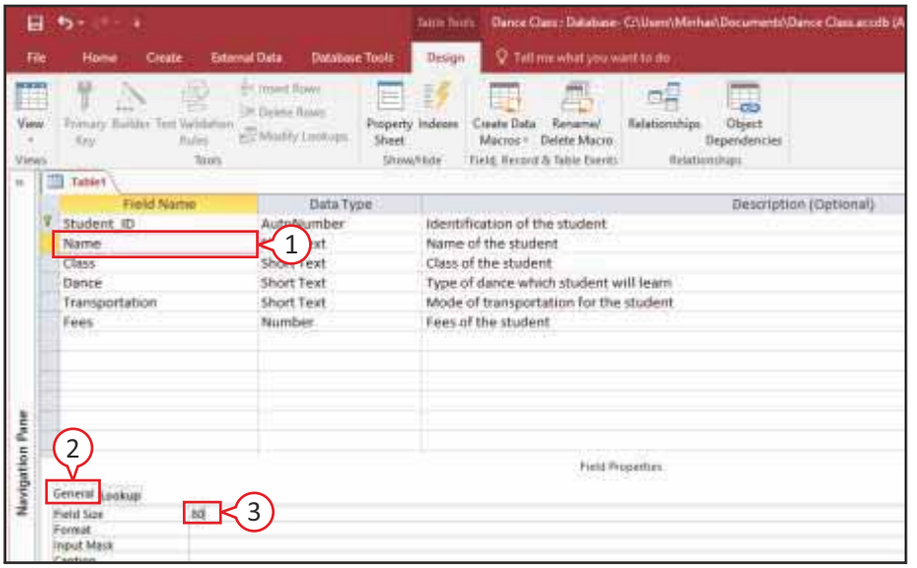
AutoNumber



Number

SET FIELD SIZE PROPERTIES

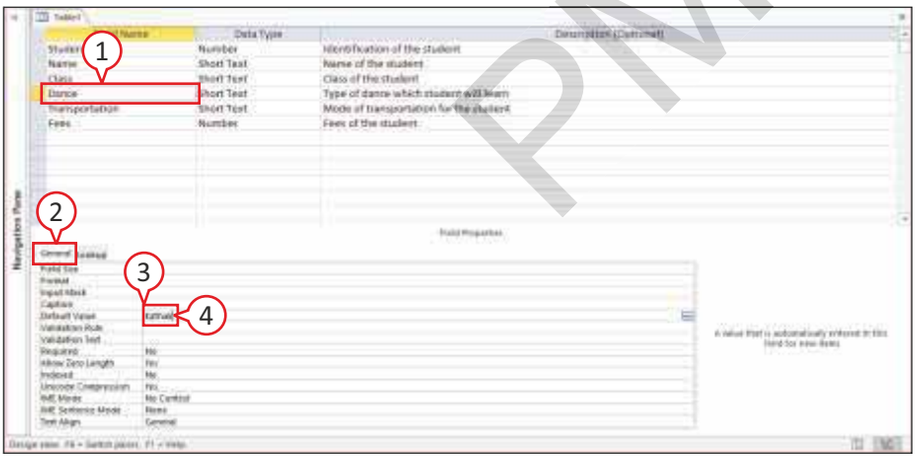
The default field size for a field with a data type of text is 255 characters. You can change this size in the range from 0 to 255 characters.



1. Click on the field whose size you want to change.
2. Click on **General** tab in the Field Properties pane.
3. Enter the new field size in the **Field Size** text box.

SET A DEFAULT VALUE

You can speed up data entry for fields that usually contain the same value by making that value as the default. For example, if 90% of students take Kathak as dance, you can make Kathak the default value in the Dance field.



1. Click on the Field whose default value you want to set.
2. Click on **General** tab in the Field Properties pane.
3. Click on the next to **Default Value** field.
4. Type the default value (Kathak).

Access automatically adds quotation marks around what you typed, if the data type is Text.

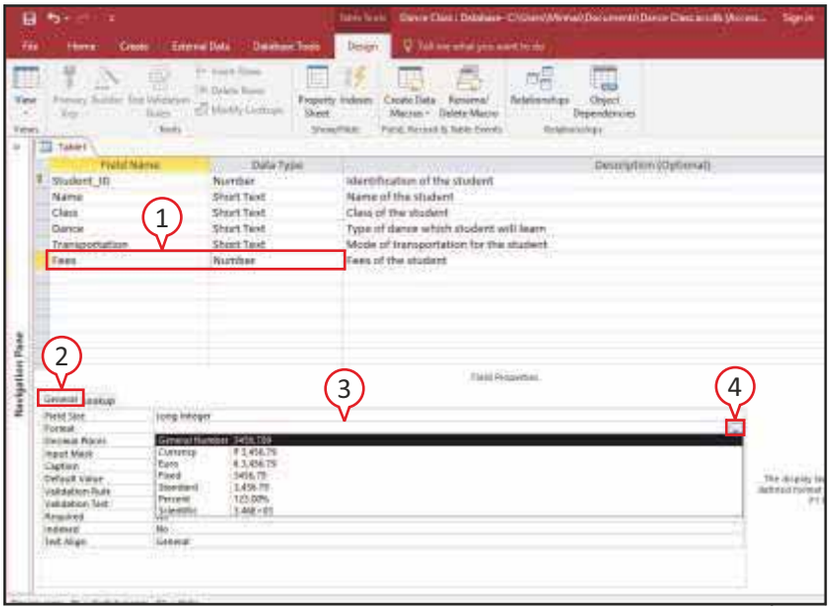
- When you display the datasheet of the table, the default value (Kathak) appears in new records.

Update Your Knowledge

You can resize text and numeric data type only. All the other data type size is predefined.

SET THE FIELD FORMAT

You can change the format of a field to update its appearance in datasheet, form, and report.



1. Click on the Field whose format you want to change.
2. Click on **General** tab.
3. Click in the next to **Format** field.

A drop-down menu arrow appears.

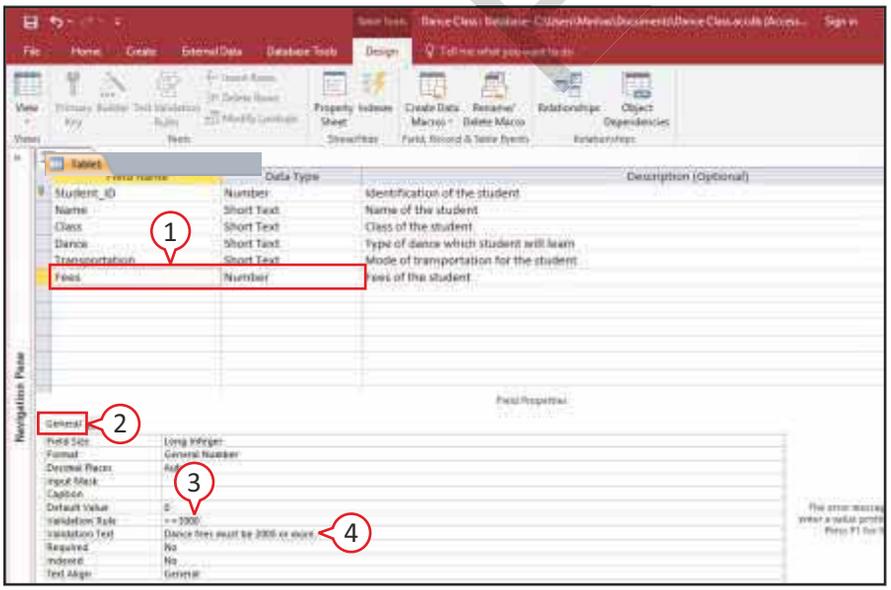
4. Click drop-down menu arrow to choose the format that you want.

- For a **Number** or **AutoNumber** field, the choices represent different number types, such as General, Currency, and Percentage.
- For **Date/Time** data types, the choices appear as date/time format.
- For **Yes/No** fields, the choices appear as ways of expressing 'Yes' or 'No'.

Note: *Certain field types such as* ***Short Text, Long Text,*** *and* ***Hyperlink*** *have no preset formats.*

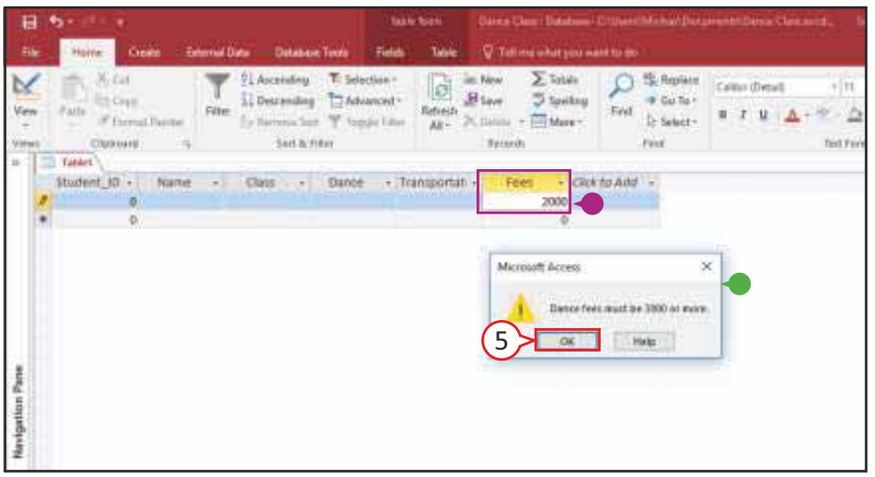
CREATE VALIDATION RULES

A **validation rule** is used to limit a field entry to meet certain criteria. By validation rules, you can ensure that the correct value is entered into the field. If the user makes an incorrect entry, error alert can stop the user, provide a warning or just provide information.



1. Click on the Field where you want to apply validation rule.
2. Click on **General** tab in the Field Properties pane.
3. Click on the next to **Validation Rule** field, and type the validation rule in that row.
4. Click in the next to **Validation Text** field, and type the text for the error message.

Here, we have validated a rule that fees should be equal to or more than 3000.

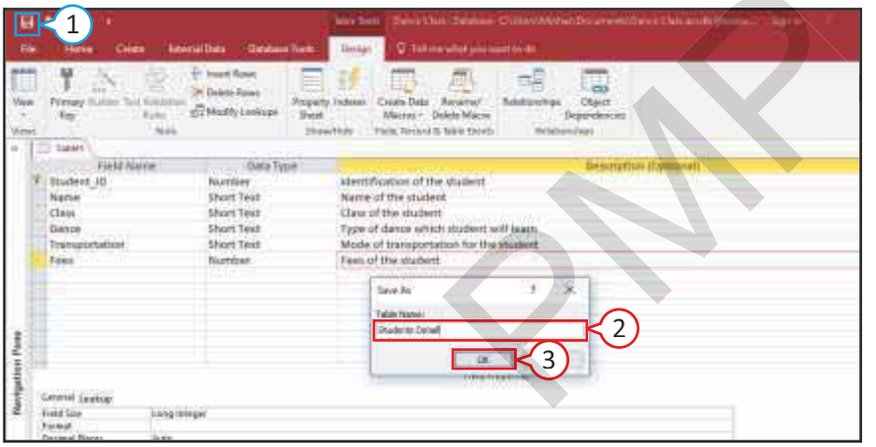


- In this example, we have entered 2000, although the rule says it should be more than or equal to 3000.
- In the datasheet view, if you enter a wrong entry or violate the rule, a custom error message appears, containing the text you specified in the validation Text.

5. Click on **OK,** then retype the correct entry.

SAVING AND CLOSING THE TABLE

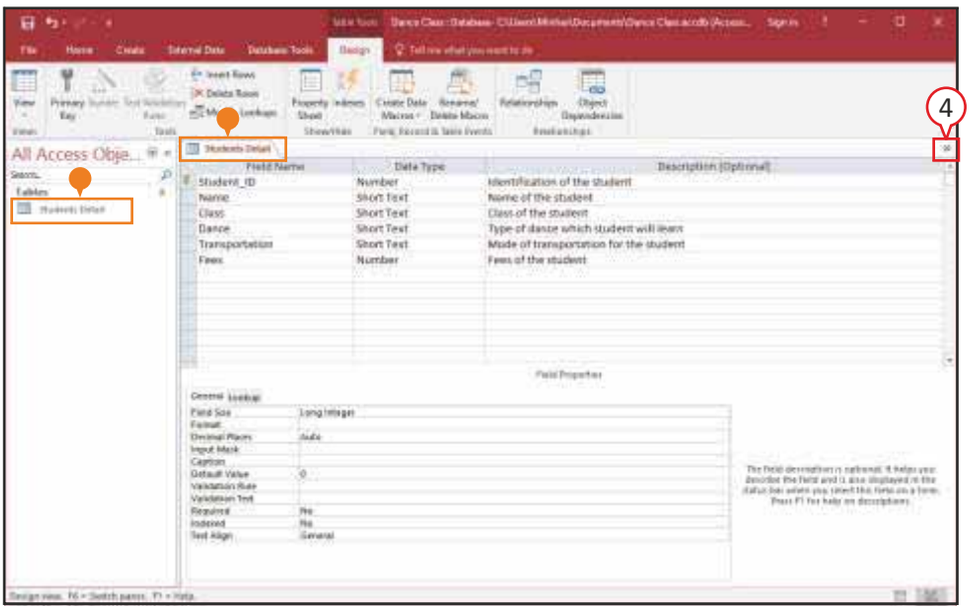
Table structure is now complete. The next step is to save the table in the database. You should give a name to the table before saving it. Once you have saved the table, you can continue working in the Table window or close the window.



1. Click on the **Save** button on the Quick Access Toolbar.

The **Save As** dialog box appears.

2. Type the name (Students' Detail) in the **Table Name** box.
3. Click on **OK**.



- Access saves the table, and the table name appears in the Object tab and Navigation Pane.

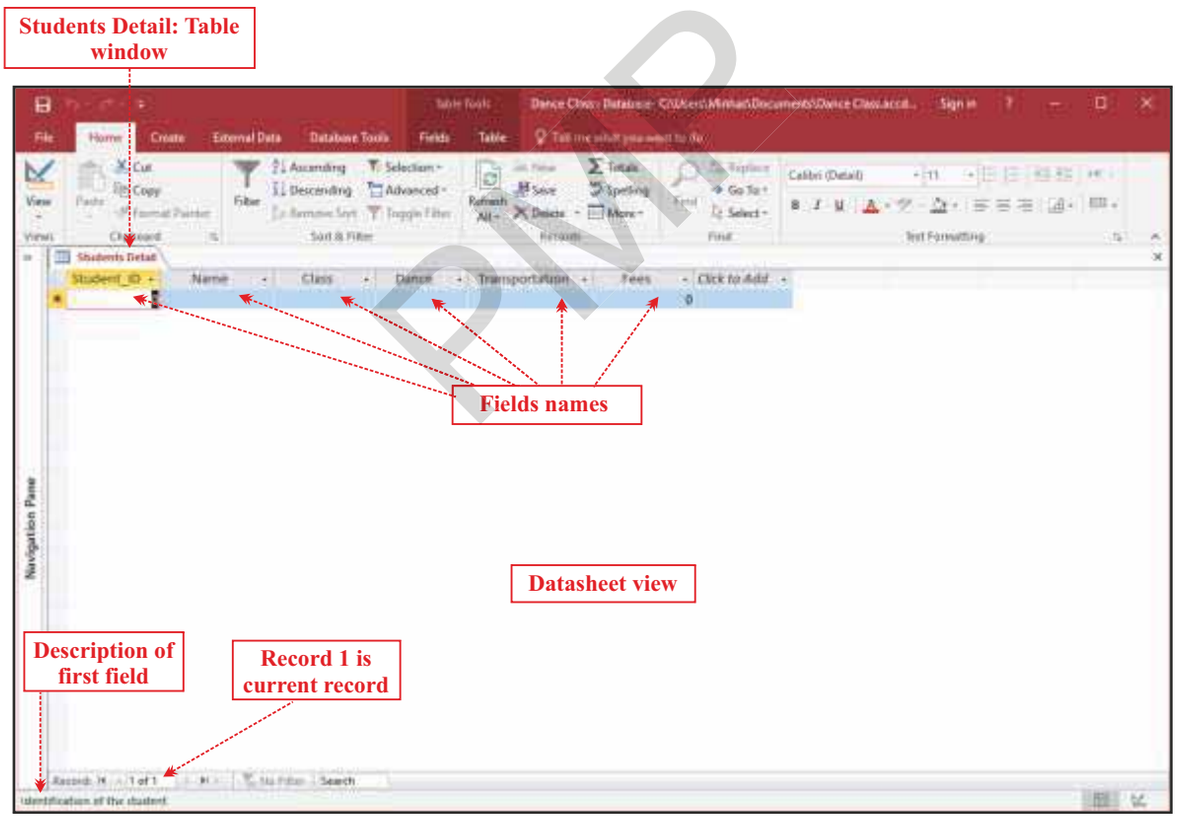
4. Click on the **Close** button to close the Table structure.

Adding Records to a Table

The first step is to create a table and save it. The second step is to add records to the table. The table must be open so that the records can be added to it. The table is displayed in a Datasheet view. In Datasheet view, the table is represented as a collection of rows and columns called **datasheet**.

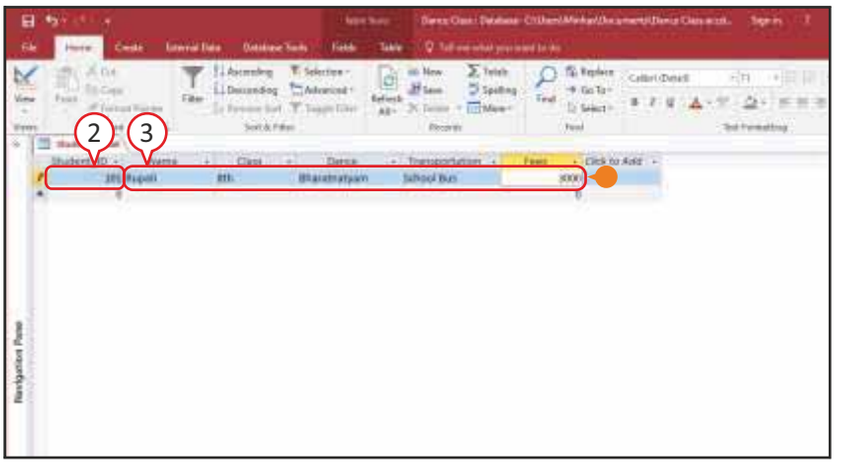
1. Double-click on table (Students' Detail) in the **Dance Class**.

You can close the **Navigation Pane** to give more space to the table.



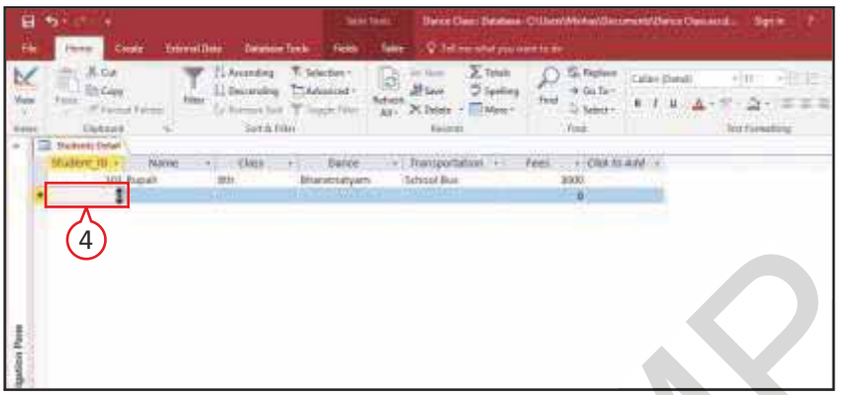
Update Your Knowledge

- The Default Value property applies to all table fields except those fields with the data type of **AutoNumber** or **OLE Object**.
- The maximum length for a Default Value property setting is 255 characters.
- If you set the Default Value property for a text box control to =Now(), the control displays the current date and time.



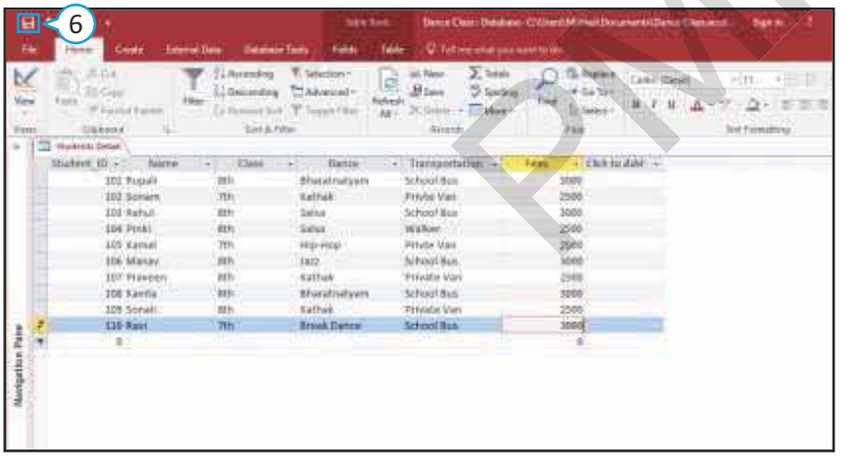
2. Type the ID Number in the first Student_ID field.
3. Press the **Tab** key to move to Name Field.

- Type the remaining entries by pressing the Tab key after each one to complete the record.

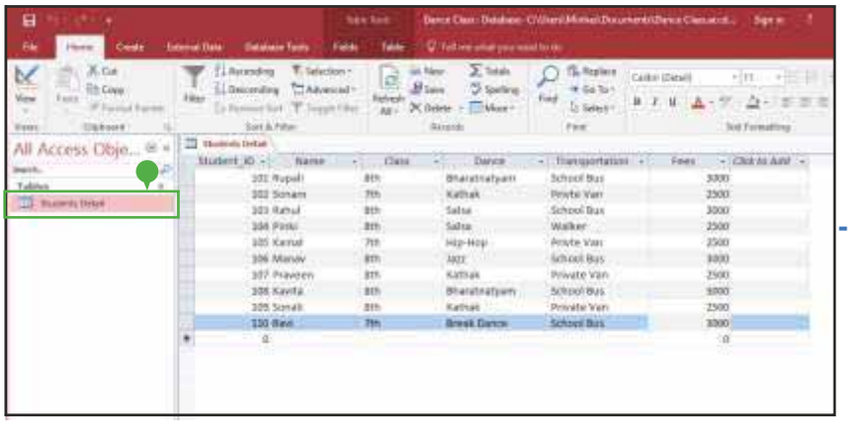


4. After typing the last entry, e.g. Fees, press the **Tab** key.

The insertion point comes to the Student_ID field in the second row.



5. Add the remaining records by following the same steps you used to add the first record, as in steps **2** to **4**.
6. When you finish entering data, click on **Save** to save the changes.



- *Access saves the table and you can see the name of the table in Navigation pane.*

As per the project, part-2: records in the table are added.

Self-Evaluation

CHECKLIST

After reading the chapter, I know these points:

	Agree	Disagree
I know that database is a collection of data organized in a manner that allows access, retrieval, and use of that data.	☐	☐
I know that Microsoft Access is a Relational Database Management System used to create, manage and process data in form of multiple tables.	☐	☐
I know that tables consist of columns and rows that are used for holding data.	☐	☐
I know there are two ways to create a table: Datasheet view and Design view.	☐	☐
I know that a primary key is the key that differentiates the records in a table.	☐	☐
I know that each field has a set of properties that defines and controls it.	☐	☐

Exercises

A. Tick (✓) the correct answer.

1. The software that helps to enter and organize data in a database is ..... .
   a. Access ☐ b. Excel ☐ c. Word ☐
2. A row in a table that contains information is called ..... .
   a. field ☐ b. record ☐ c. datasheet ☐
3. The specific piece of information in a table is known as ..... .
   a. field ☐ b. value ☐ c. record ☐
4. ..... is the combination of data from multiple related tables into a single datasheet.
   a. Query ☐ b. Report ☐ c. Filter ☐
5. The data type that is used for detailed and descriptive fields is ..... .
   a. Currency ☐ b. Long Text ☐ c. AutoNumber ☐

B. Write 'T' for True and 'F' for False statements.

1. A row in a table is called field. ☐
2. A RDBMS allows us to create a computerized database. ☐
3. Navigation pane lists all available database objects. ☐
4. There must be a unique name for each field in the table. ☐
5. Currency data type can store currency data that cannot be used in calculations. ☐

C. Fill in the blanks.

1. A database consists of table, organized in ..... and ..... .
2. Each field has a ..... that defines what we can store in it.
3. The default field size for a field with a data type of text is ..... characters.
4. The extension of database file in Access is ..... .
5. A ..... is a key that differentiates the records in a table of database.

D. Define the following terms.

1. Database: .....

   .....

2. Data Sheet View: .....

   .....

3. Data Type: .....

   .....

E. Differentiate between the following.

1. Record | Field

   ..... | .....

   ..... | .....

   ..... | .....

2. Short Text Data type | Long Text Data type

   ..... | .....

   ..... | .....

   ..... | .....

F. Answer in 1-2 sentences.

1. What is the use of Microsoft Access?

   .....

   .....

2. Why do we use templates in Access?

   .....

   .....

3. Why do we need a primary key?

   .....

   .....

4. What is the use of default value in the properties?

   .....

   .....

G. Answer briefly.

1. What is the role of tables in database?

   .....

   .....

   .....

2. Why should we specify validation rules while creating a table?

   .....

   .....

   .....

H. Application-based Question

Somya has made a database table in Access containing fields like Student_name, Class, Roll_no and Contact_no. She has set the primary key for the field 'Student_name'. Has she done the right thing by setting the primary key for this field?

.....

Group Discussion

Divide the students into two groups and discuss– 'Advantages and Disadvantages of Database Management System'.

Online Link

To learn more about creating a database in Access, visit the website:

https://www.quackit.com/microsoft_access/microsoft_access_2016/tutorial/create_a_database_in_microsoft_access.cfm

Activity Section

Lab Activity

Skill Formation

- These activities enhance data organization and management skills of the students.

1. Create a table using the Design view, containing following fields in it:

Field Name	*Data Type*	*Description*
Last_Name	Short Text	
First_Name	Short Text	
Date_of_Birth	Date	
Qualification	Short Text	
Address	Long Text	
Date_of_Joining	Date	
Contact_Number	Number	

a. Create a database 'Introduction' and save it in **'Lab Activity'** folder.
b. Add suitable description for each field name.
c. Now enter 20 records in the table.
d. Save the table as **'Personal Information'.**

2. Create the following database in Access.

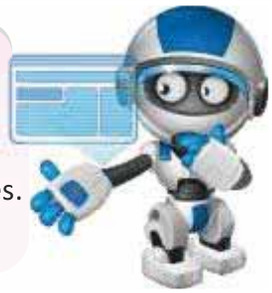
a. Create a new database as 'Address' and save it in **'Lab Activity'** folder.
b. Now create a table in Datasheet view that contains the following fields in it:
Contact_ID, First_Name, Last_Name, Address, City, Phone, Date_of_Birth
c. Save the table as **'My Contacts'.**
d. Select 'Contact_ID' as the primary key field in which numbers are to be added manually.
e. Now enter ten records in the table.
f. Add another field name 'Email' to the table and update the records accordingly.
g. Close the database and Access.

3 Access – Tables and Forms

OBJECTIVES

After completing this chapter, you will be able to:

- Understand how to work with database tables.
- Learn to filter and sort the records.
- Learn to create and delete relationship between tables.
- Understand types of forms and its creation.



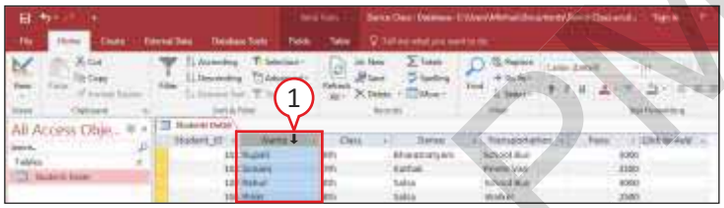
Working with Database Table

A database table is composed of records and fields that hold data. Tables are also called **datasheets**. In the previous chapter, you created a database table and added records to it. After creating table, you need to work on it.

SELECTING DATA IN A TABLE

Before performing any task in a table, you need to select data in it. The selected data appears highlighted on your screen. To make a selection, perform the following steps.

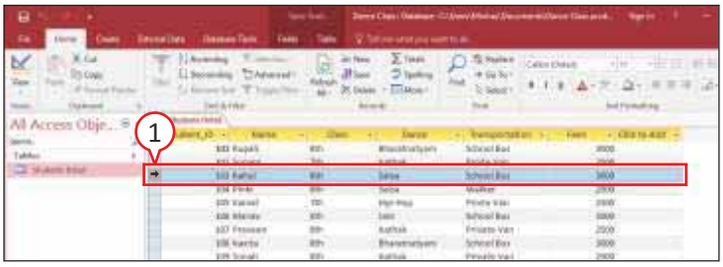
Select a Field



1. Place your mouse pointer over the name of the field you want to select. *The mouse pointer changes to (⬇).* Now click to select the field.

To select multiple fields, position the mouse pointer over the name of the first field. Then drag the mouse pointer (⬇) until you highlight all the fields you want to select.

Select a Record



1. Place your mouse pointer over the area to the left of the record you want to select. *The mouse pointer changes to (➡).* Now click to select the record.

To select multiple records, place your mouse pointer over the area to the left of the first record. Then drag the mouse (➡) until you highlight all the records you want to select.

Select a Cell

1. Place your mouse pointer over the left or right edge of the cell you want to select. *The mouse pointer changes to (✥).* Now click to select the cell.

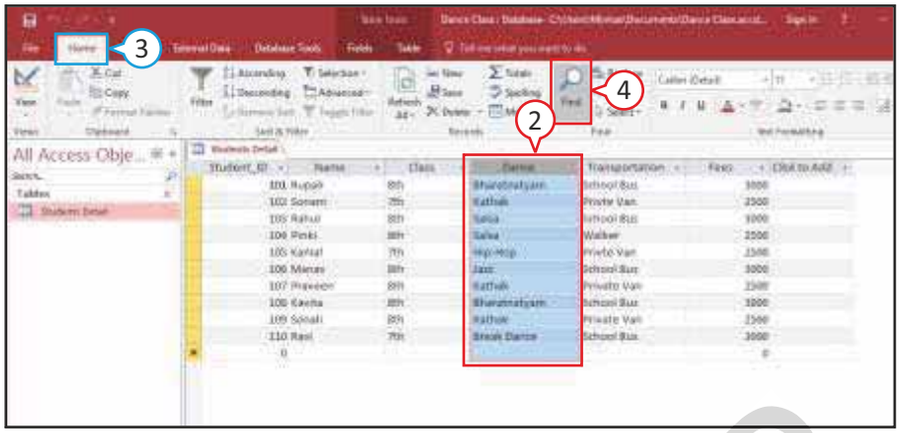
To select multiple cells, position the mouse pointer over the left edge of the first cell. Then drag the mouse (✥) until you highlight all the cells you want to select.

USING THE FIND AND REPLACE FEATURE

You can **find** a particular record and **replace** the same with some other text in a large table.

Find Option

Find allows you to quickly search data in tables, queries, and forms for specified database task. To search through all records in the current field only, you can select a field. This is usually fast, especially if the field is indexed. To search through all the fields in all the records, you can select the datasheet or form.



1. Open the table from which you want to find the information.
2. Select the field (Dance) where you want to search.
3. Click on the **Home** tab.
4. Click on **Find** from the Find group *(or press Ctrl+F)*.

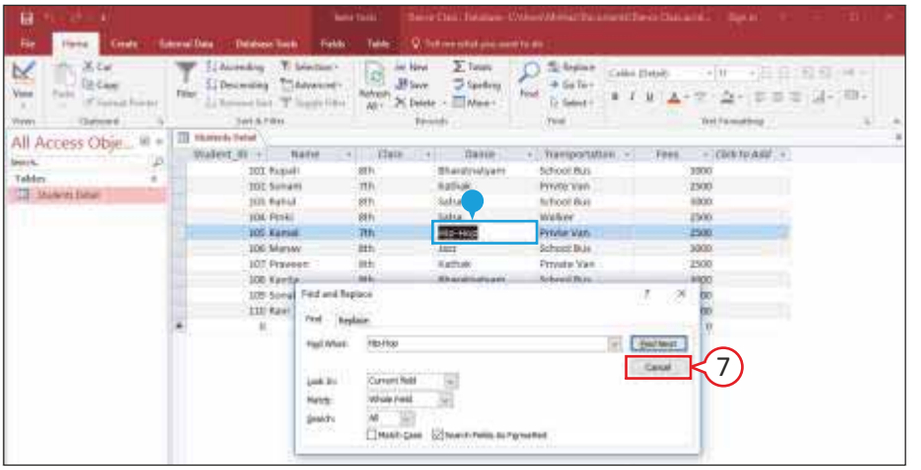
- The **Find and Replace** dialog box appears with the **Find** tab selected.

5. In the **Find What** text box, type the text you want to find (Hip-Hop).

You can select the following options according to your requirement.

- **Look In** drop down box allows you to search only the current field (faster) or all the fields in the entire table (slower).
- **Match** drop down box gives you the options to select any one of the match type. Click on any part of the field. This provides the broadest possible search.
- **Search** drop down box allows you to search up or down from the insertion point, or search the whole document.
- **Match Case** check box allows you to find only text that has the same pattern of uppercase and lowercase characters as the text you specified.
- **Search Fields As Formatted** check box allows you to check the search based on the format rather than the value.

6. Click on the **Find Next** button.



- Access jumps to the first (and only) occurrence of the word 'Hip-Hop' that it finds in the selected field.

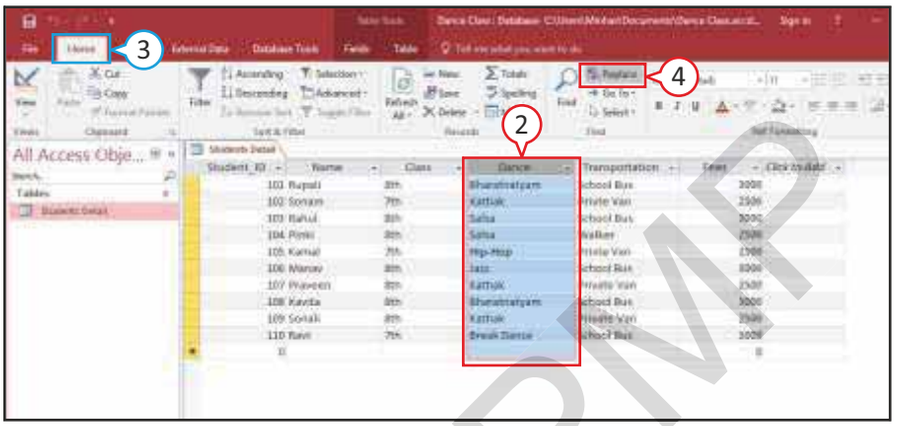
7. To close the dialog box, click on **Cancel**.

The Find and Replace dialog box closes.

You can also replace information in a database.

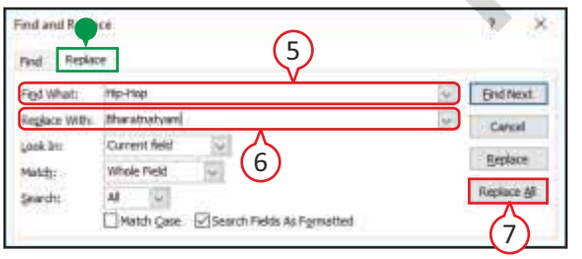
Replace Option

After finding the data, you can replace it with some other text you specify.



1. Open the table in which you want to replace data in record.
2. Select the field (Dance) where you want to search and then replace.
3. Click on the **Home** tab.
4. Click on **Replace** from the Find group *(or press Ctrl+H)*.

- The **Find and Replace** dialog box appears **with** the **Replace** tab selected.



5. In the **Find What** text box, type 'Hip-Hop'.

In this example, we will replace every occurrence of the word 'Hip-Hop' with the word 'Bharatnatyam'.

6. Select the **Replace With** text box by clicking it and type 'Bharatnatyam'.
7. Click on **Replace All**.

Access finds all the occurrences of the word 'Hip-Hop' in the table and replaces them with the word 'Bharatnatyam'.

CHANGING TABLE VIEW

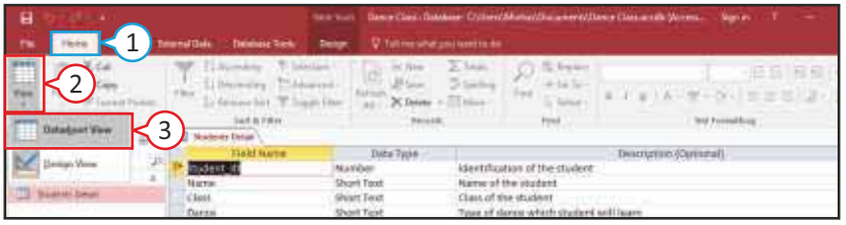
Datasheet view and **Design view** are the two views in which you can create your table. In Datasheet view, you can enter data. You can use Design view to modify the structure of the table.

Switch to Design View from Datasheet View

1. Click on **Home** tab.
2. Click on **View**.
3. Click on **Design View**.

Access displays the design of the table and shows the fields properties.

Switch to Datasheet View from Design View



1. Click on **Home**.
2. Click on **View**.
3. Click on **Datasheet View**.

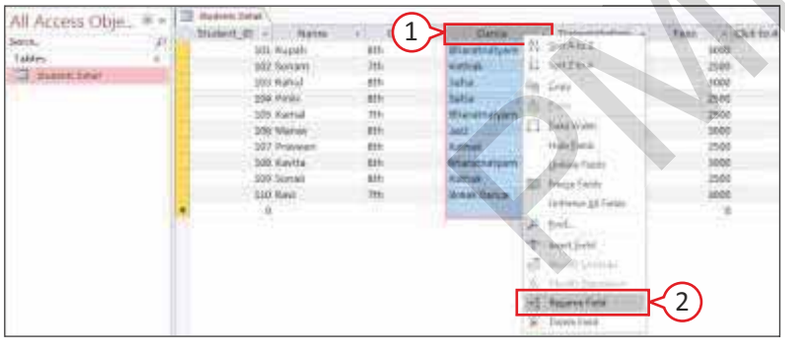
Access displays table in Datasheet view.

EDITING FIELDS IN A TABLE

You can edit the fields in a table by renaming, adding, and deleting them.

Rename a Field

If you are not satisfied with the name of a field, you can rename the field of the table to describe the contents of the field more accurately.



1. Right-click the field whose name you want to change.

A menu will appears.

2. Click on **Rename Field**.

The field name is highlighted.

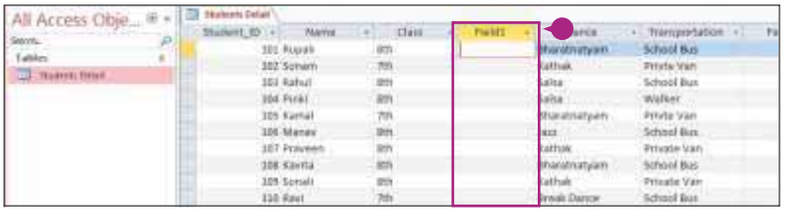
3. Type a new name for the field and then press the **Enter** key.

The field displays the new name.

Add a Field

You can add a field to a table when you want to include an additional category of information.

1. Right-click the name of field that you want to be displayed after the new field. A menu appears.
2. Click on **Insert Field**.



- *The new field appears in the table.*

*Access assigns a default name to the new field as **Field1**.*

Now, you can rename the field name and add information in it.

Delete a Field

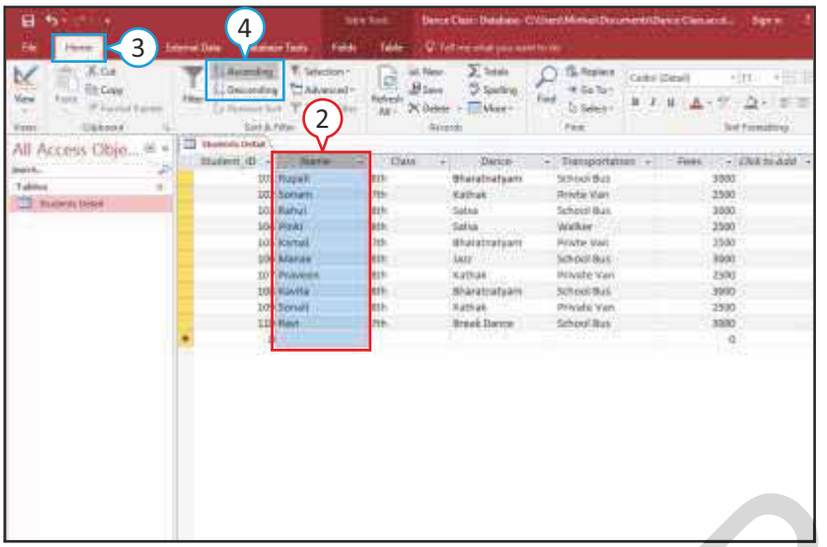
You can delete a field that you no longer need in a table.

1. Right-click on the field that you want to remove.
2. Click on **Delete Field**. A prompt box appears.
3. Click on **Yes**. *Access removes the field and any data content for the field from the table.*

SORTING RECORDS

Sorting means arranging the records in a particular order, ascending or descending. To sort the records, select the field on the basis of which you want to arrange the records.

You can change the order of records in a table. This can help you find, organize, and analyze data quickly.



1. Open the table that you want to sort.
2. Click on the column header for the field that you want to sort.
3. Click on the **Home** tab.
4. Click on **Ascending** ( ) to sort the records in ascending order.

   OR

   Click on **Descending** ( ) to sort the records in descending order.

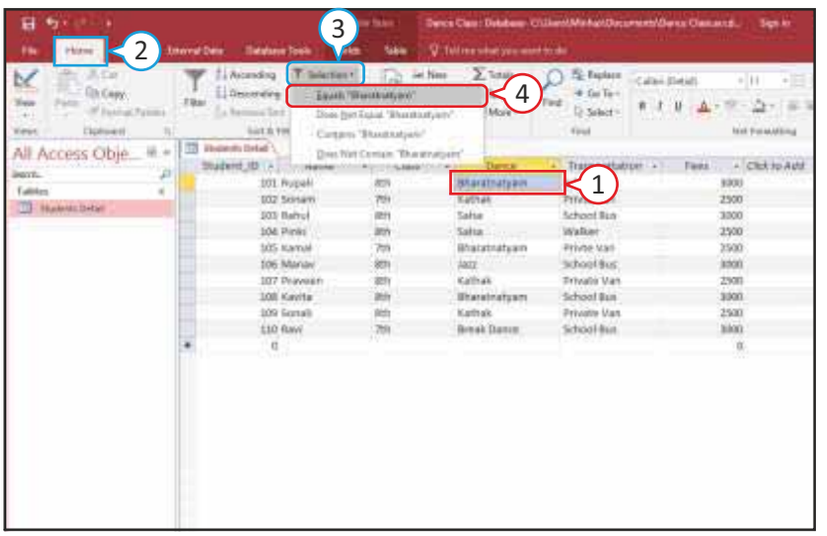
The records appear in the new order.

Filtering Data

You can filter data in a table to display only those records that contain the data of interest. **Filtering** data can help you review and analyze information in your database table.

FILTERING DATA BY SELECTION

It is used to display only those records that contain exactly the same data. For example, if you want to find all the students whose Dance type is **Bharatnatyam**, you can use **Filter Data** option in Access.

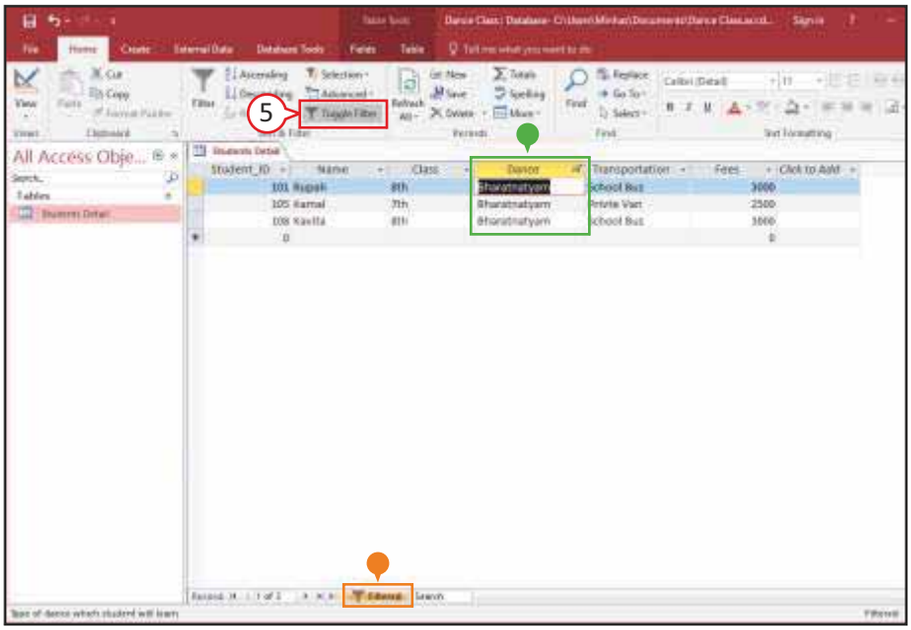


1. Click the data you want to use to filter the records.

Access will display only those records that contain exactly the same data.

2. Click on **Home** tab.
3. Click on down arrow of **Selection**.
4. Select the filter criteria.

In this example, we have selected criteria **Equals "Bharatnatyam"**.



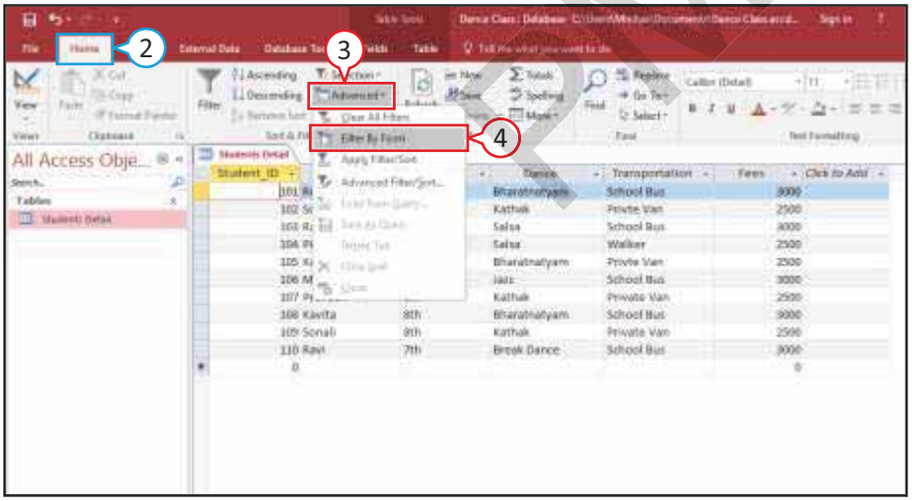
- Access displays only the records containing the exact match of filtered data. All other records are hidden.
- The **Filtered** tab appears in this area to indicate that you are viewing filtered records.

5. When you finish reviewing the filtered records, click on **Toggle Filter** once again to display all the records.

FILTERING DATA BY FORM

Filtering by form enables you to filter by multiple fields and specify criteria for as many fields as you like. When you filter by form, you can combine the criteria using AND, OR, or a combination of the two. An AND combination finds records where both criteria are met; an OR combination finds records where at least one of the criteria is met.

Using 'AND'



1. Open the table if it is not already opened.
2. Click on **Home** tab.
3. Click on **Advanced** from Sort & Filter group.
4. Select **Filter By Form** from the shortcut menu.

Update Your Knowledge

To sort by more than one column, highlight the columns by clicking and dragging the mouse over the field labels, and select the sort method.

Update Your Knowledge

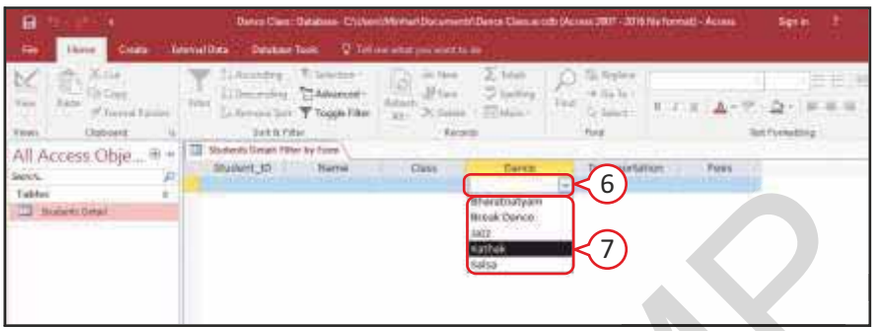
Filter by Form can be advantageous when the table is too large and it is difficult to find the record that contains the value you would like to filter.

*The **Filter by Form** sheet appears, which looks like an empty replica of your table.*

Now you have to select the **field** and the **value** you want to use as your criteria.

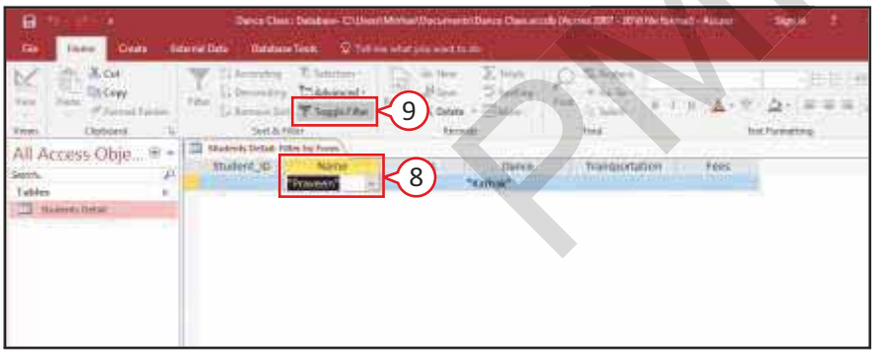
5. Click on **Dance** field.

- A drop down arrow appears in the field where the cursor is placed.



6. Click on the drop down arrow of Dance to see a list of values used in this field.
7. Select **Kathak** from the list.

This displays only those records whose Dance field contains 'Kathak'.



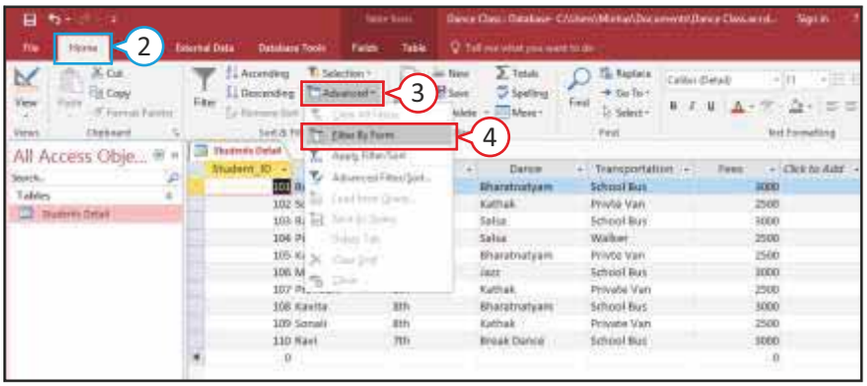
8. Click on the **Name** field, click on the Name list arrow, and select the name of student (Praveen) from the list.
9. Click on the **Toggle Filter** button.

- Access applies the filter and displays only those records whose Dance field equals 'Kathak' AND whose Name field equals 'Praveen'.

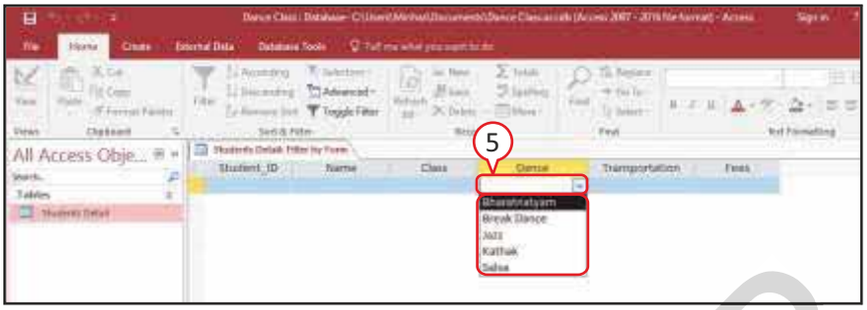
In this example only one record meets the filter criteria.

You can create an AND criteria statement specifying more than one criteria on the same **Filter by Form** tab. For example, you could filter for Name of the student who is learning Kathak AND who is availing transportation by Private van.

Using 'OR'

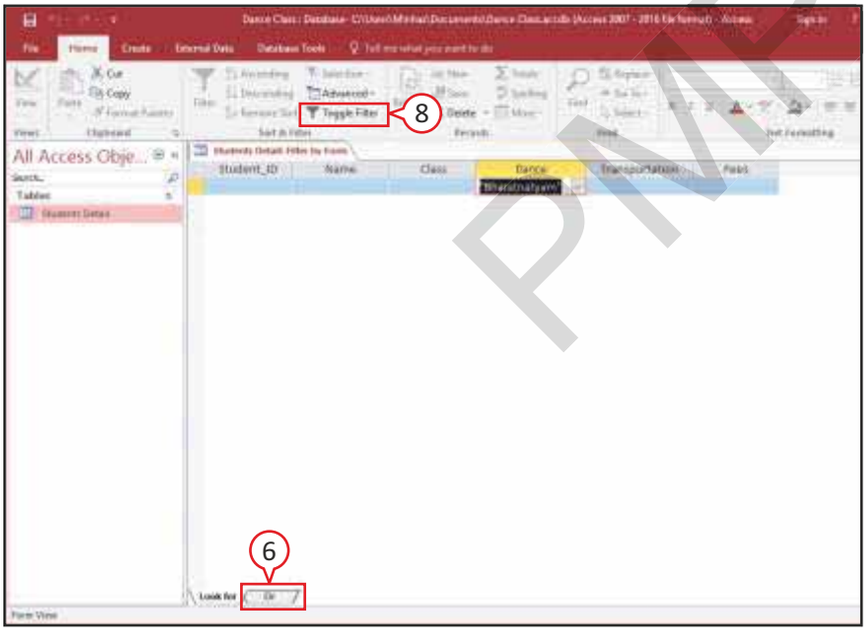


1. Open the table if it is not already opened.
2. Click on **Home** tab.
3. Click on **Advanced** from Sort & Filter group.
4. Select **Filter By Form** on the shortcut menu.



*A **Filter by Form** sheet opens.*

5. Open the list for a field and select the value that you want.



6. Click on the **Or** tab.

*A blank **Filter by Form** page opens.*

7. Repeat step **5** to select another criterion.
8. Click on **Toggle Filter** to apply the filter.

Access applies the filter and shows you the records.

Keyboard Shortcuts

Ctrl + T	Toggle AutoFilter
Ctrl + 3	Move selected field to view the filter area

Update Your Knowledge

If you have previously performed a filter operation, the last filter that you ran appears in the form, for your convenience. Delete it from there if you do not want it by clicking on the Advanced button and then clicking on **Clear All Filters**. If the Clear All Filters command is not available, there are no previously used filters to clear.

Creating Relationship Between Tables

Relational databases are powerful because they can be used to create relationship among multiple related tables. For setting relationship, you need at least two tables. You have already created **Students Detail** table in previous chapter. Similarly, you need to create one more table. In this example, we have created one more table named **Dance Practice**.

For a relationship to exist between two tables, they must have a common field. For example, the Students Detail table may have a Student_ID field, and the Dance Practice table may also have a Student_ID field. The two tables could be joined or related by that field. The field type must be the same in both tables for a relationship to exist.

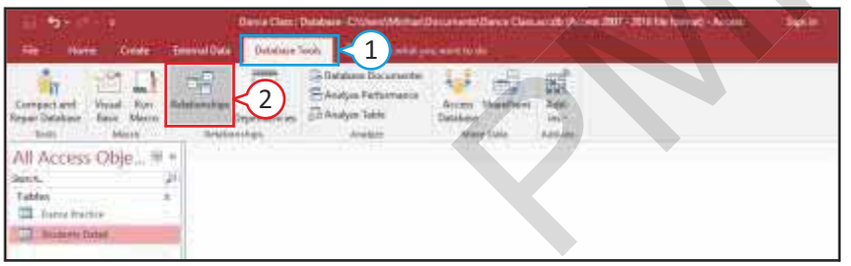
Dance Practice

Student_ID	Name	Dance	Dance Practice	Timing
101	Rupali	Bharatnatyam	Taj auditorium	3 P.M
102	Sonam	Kathak	Saka auditorium	5 P.M
103	Rahul	Salsa	Salsa auditorium	1 P.M
104	Pinki	Salsa	Salsa auditorium	1 P.M
105	kamal	Bharatnatyam	Taj auditorium	3 P.M
106	Manav	Jazz	DLF auditorium	10 A.M
107	Parveen	Kathak	Saka auditorium	5 P.M
108	Kavita	Bharatnatyam	Taj auditorium	3 P.M
109	Sonali	Kathak	Saka auditorium	5 P.M
110	Ravi	Break Dance	DLF auditorium	2 P.M

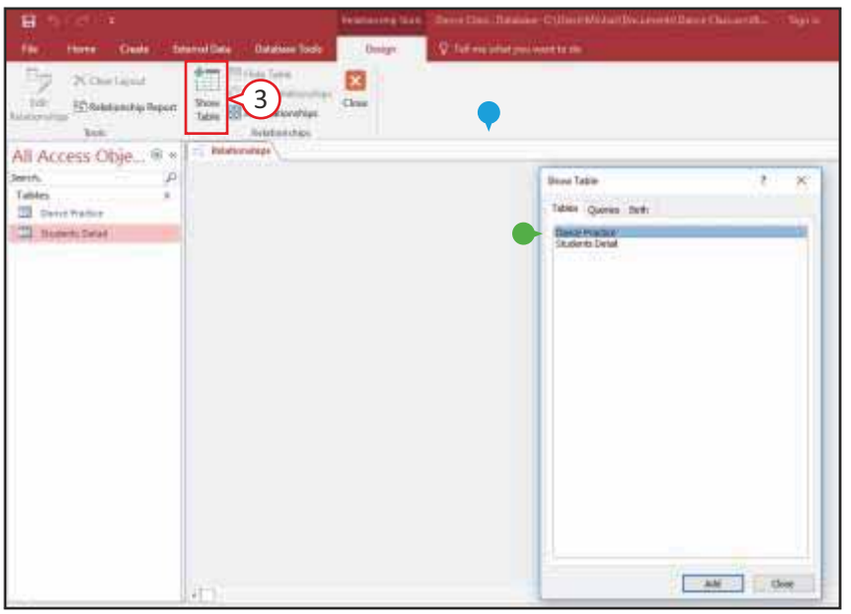
Dance Practice Table

In most relationships, the primary key field in one table is related to a field in the other table that is not its primary key. In one table, the field contains unique values, whereas in the other table it does not. The relationship field in the other table is called **foreign key**.

Relationships are created and managed in a special database view called **Relationships** window. You can create relationships between tables from there, dragging a field from one table onto a field from another.

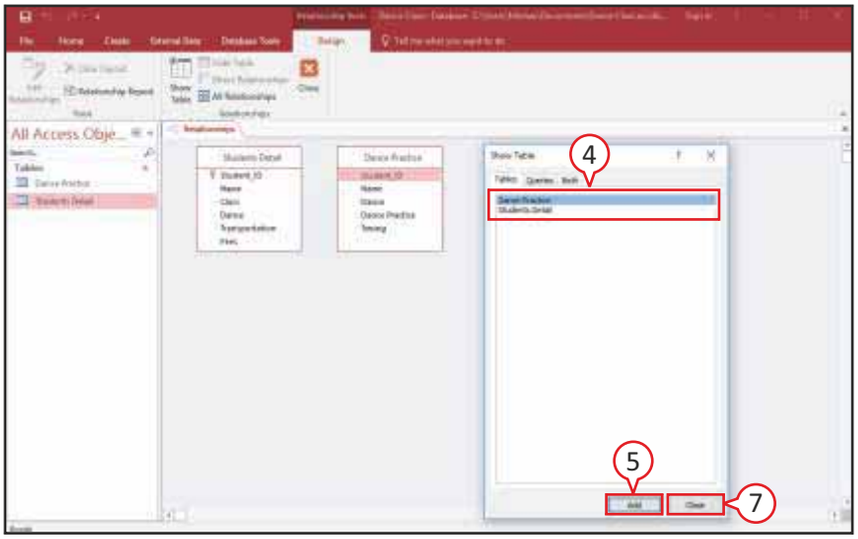


1. Click on **Database Tools** tab.
2. Click on **Relationships**.

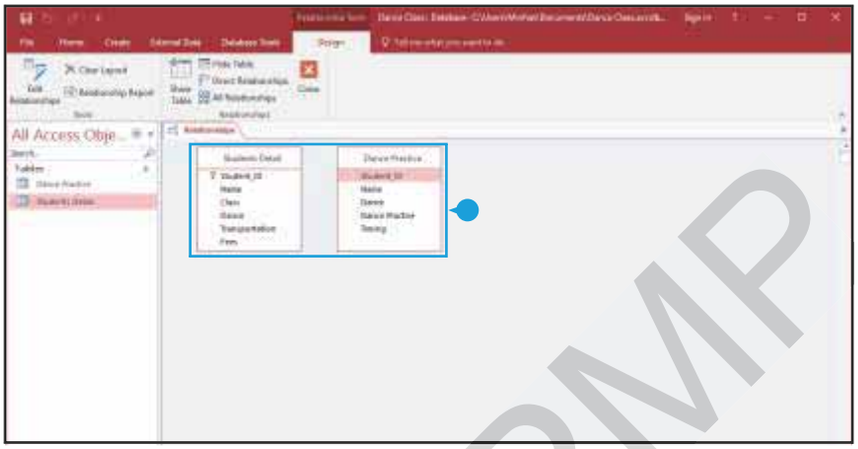


- The **Relationships** window appears. If any relationship already exists between the tables in your database, a box for each table appears in the window.
- The **Show Table** dialog box may also appear, listing all the tables in your database.

3. If the **Show Table** dialog box does not appear, click on Show Table to display the dialog box.

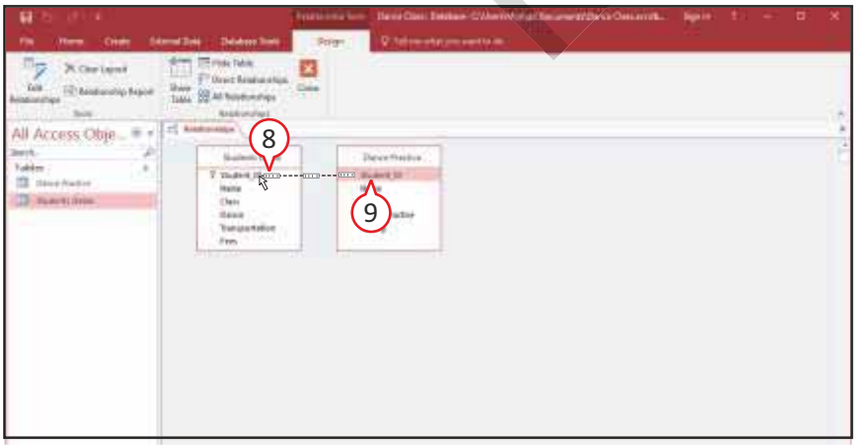


4. Click on a table to add it to the Relationships window.
5. Click on **Add** button to add the table to the window.
6. Repeat the steps **4** and **5** for each table that you want to add.
7. When you finish adding tables to the Relationships window, click on **Close** to remove the Show Table dialog box.



- The Relationships window displays a box for each table.

Now, you can create a relationship between **tables** by identifying the matching fields in the tables.



8. Place the mouse pointer over the field you want to use to create a relationship with another table.
9. Drag the field with mouse over the other table until a small box appears over the matching field.

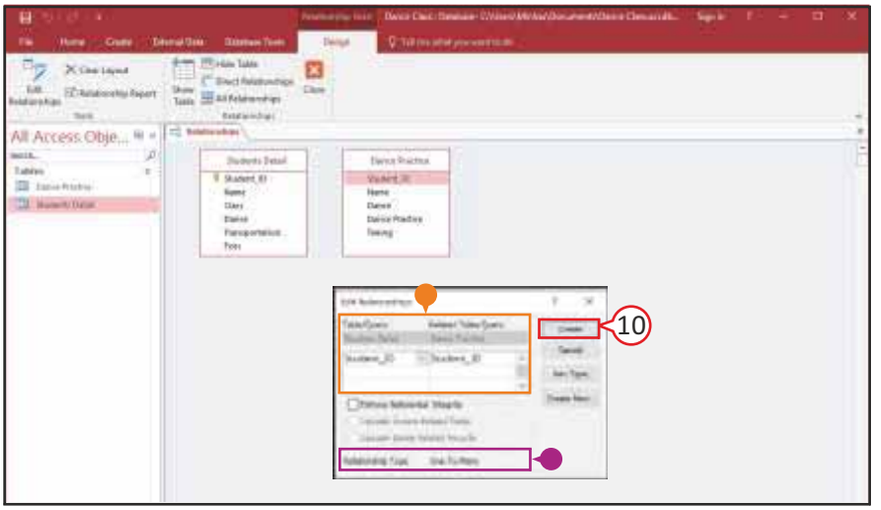
The **Edit Relationships** dialog box appears.

Update Your Knowledge

The quickest way to make changes in **Datasheet view** is through the shortcut menu that comes up when you right-click a field header.

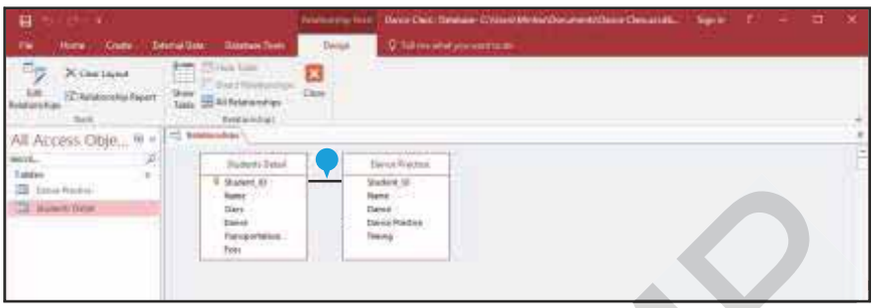
Update Your Knowledge

A **Primary key** field cannot be deleted in Access.



- **Table/Query** and **Related table/Query** areas display the names of the tables you want to create a relationship between and the names of the matching fields.
- **Relationship Type** displays the type of relationship.

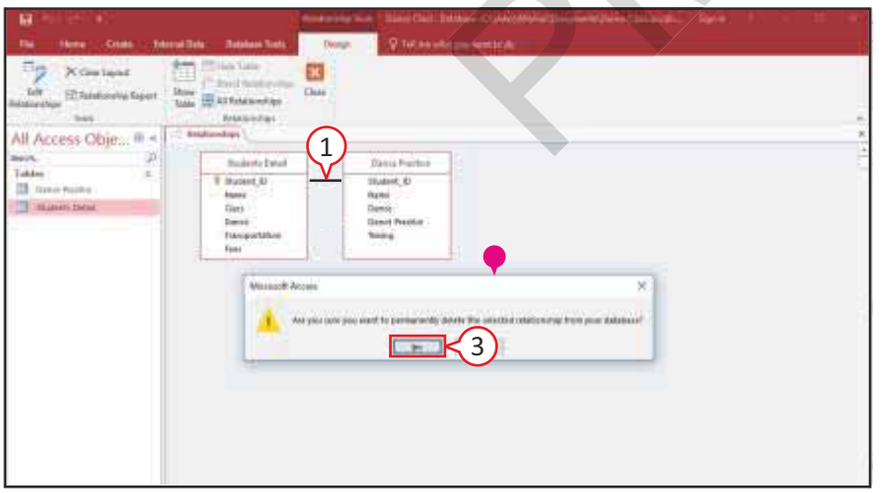
10. Click on **Create** button to create a relationship.



- A line connects the fields in the two tables to show that the relationship is created.

DELETING A RELATIONSHIP BETWEEN TABLES

If you no longer want the relationship between tables, you can delete it.



1. Click on the line for the relationship you want to delete.
2. Press the **Delete** key.
   - A warning dialog box appears, confirming the deletion.
3. Click on **Yes** button to permanently delete the relationship.

Update Your Knowledge

- A relationship works by matching the data in the key field.
- Primary key is a key which is used to identify the records uniquely. In a table, there can be only one Primary key.
- Primary key does not allow to enter duplicate values, and primary key field cannot be left blank.

Creating Forms

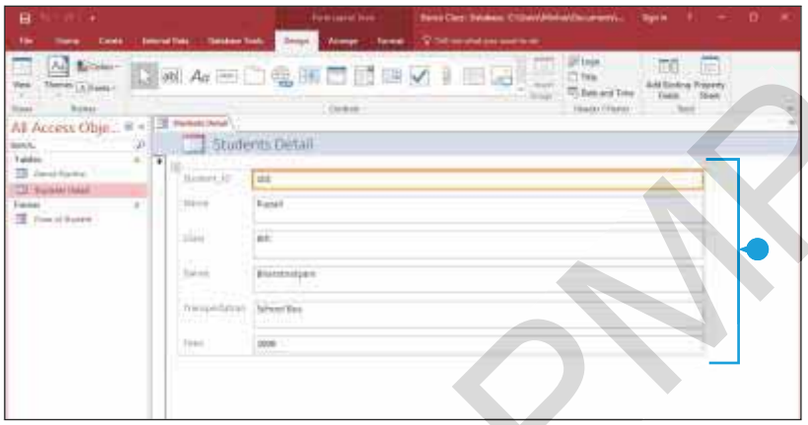
A **form** is a view of one or more tables that are designed to be used for data entry and editing. By creating forms, you can make your database more user-friendly for inexperienced users who are likely to enter and edit records in it.

CREATING A SIMPLE FORM

Access 2016 makes it very easy to create several simple types of forms based on a table.

Create a Basic Form

1. In the Navigation Pane, click on the table you want to use as a form.
2. Click on the **Create** tab.
3. Click on **Form**.

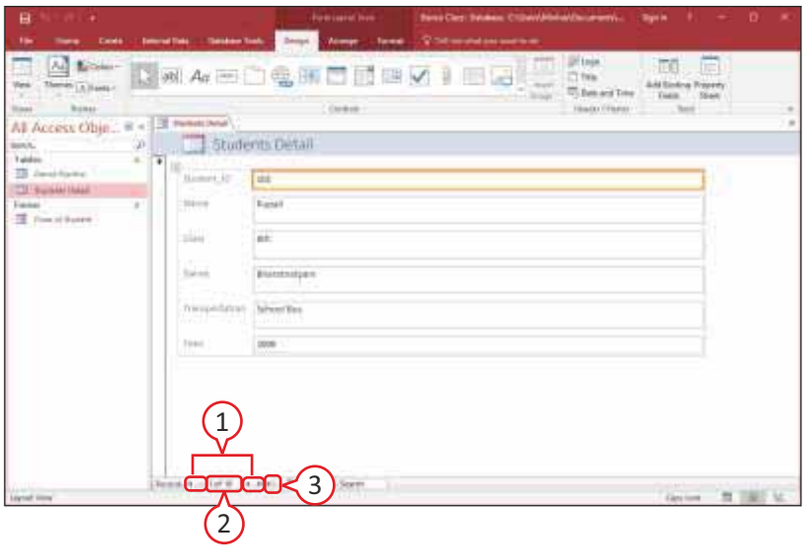


The form appears.

- The default form shows the **fields** as **fill-in boxes** for one record at a time. This makes it easier for users to enter a new record without getting confused by the multiple rows and columns of a datasheet view.

Move Through the Records

You can move through the records in a form to review or edit any information you have made.



1. To move to another record, click on one of the following buttons:
   - (⏮) First record
   - (◀) Previous record
   - (▶) Next record
   - (⏭) Last record
2. To move to the specific record, drag the mouse pointer over the number of the current record and then type the number of the record you want to move and press **Enter** key.
3. To start a new blank record, click on **New record** button.

TYPES OF BASIC FORMS

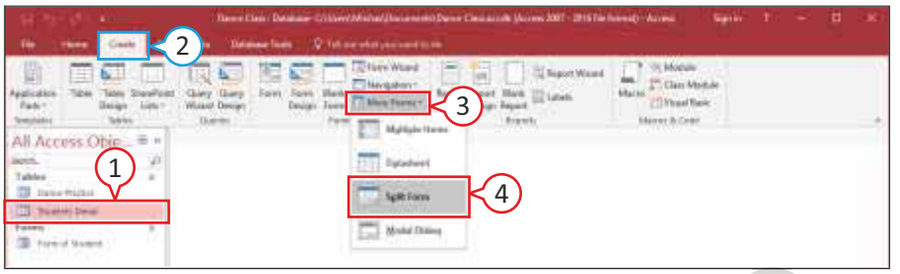
Multiple Items: In the Multiple Items form, you will see multiple records appear at the same time in it.

Datasheet: This form just looks like a regular datasheet, but it is actually a form. It is useful when you want to show a datasheet on a subform.

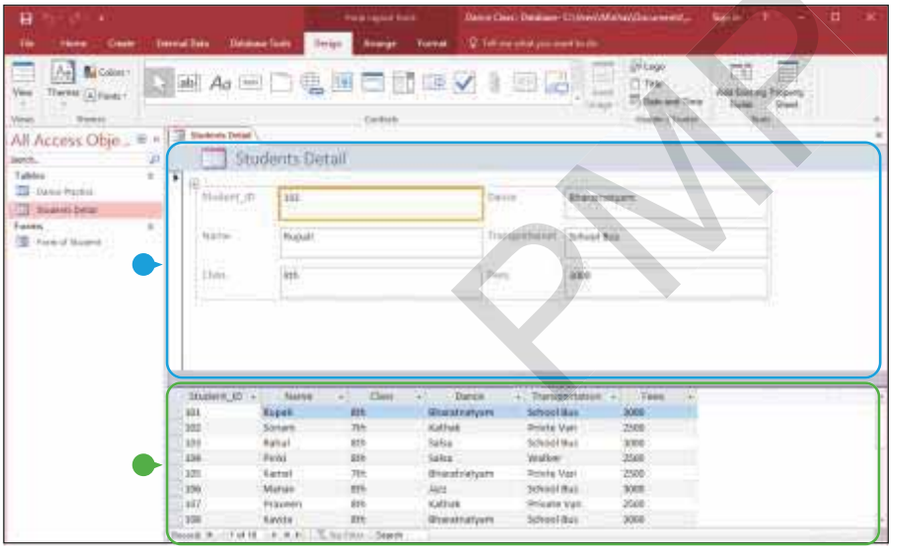
Split Form: This form shows two parts. Upper part shows the form, and lower part shows the datasheet for the table.

Modal Dialog: This form is useful for creating navigational menu systems. This form looks just like a dialog box, but it is actually a form.

Create a Split Form



1. In the Navigation Pane, click on the table you want to use as a form.
2. Click on the **Create** tab.
3. Click on **More Forms**.
4. Click on **Split Form**.

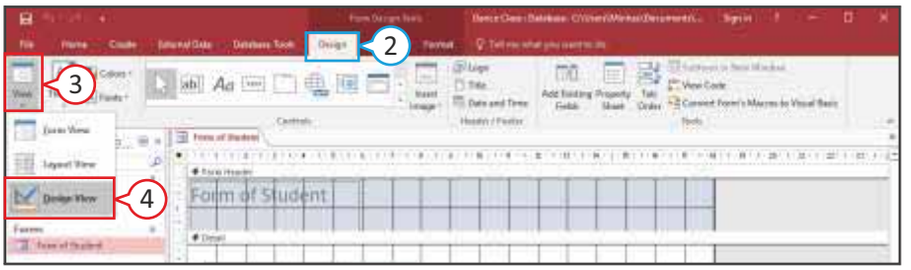


- Upper part of the screen shows the form.
- The lower part of the screen shows the datasheet for the table.

CHANGING THE VIEW OF FORMS

You can customize your form using Design and Layout views. In **Design view**, each object appears as a separate, editable element in the form. In **Layout view**, you can re-arrange the form controls and adjust their sizes directly on the form.

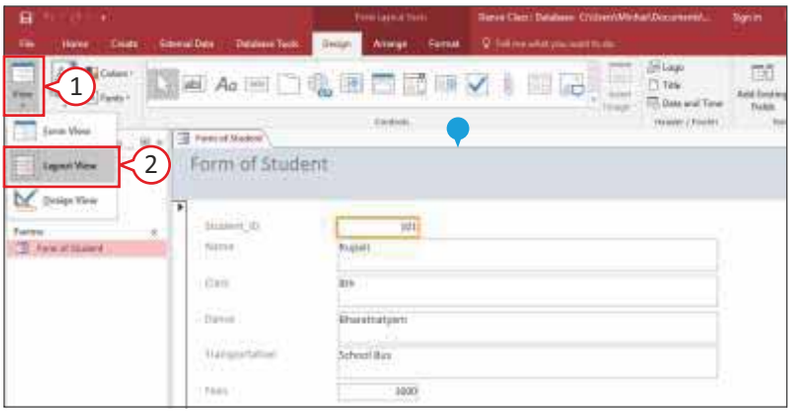
In Design View



1. Open the form.
2. Click on **Design** tab.
3. Click on **View**.
4. Click on **Design View**.

Access displays the form design.

In Layout View



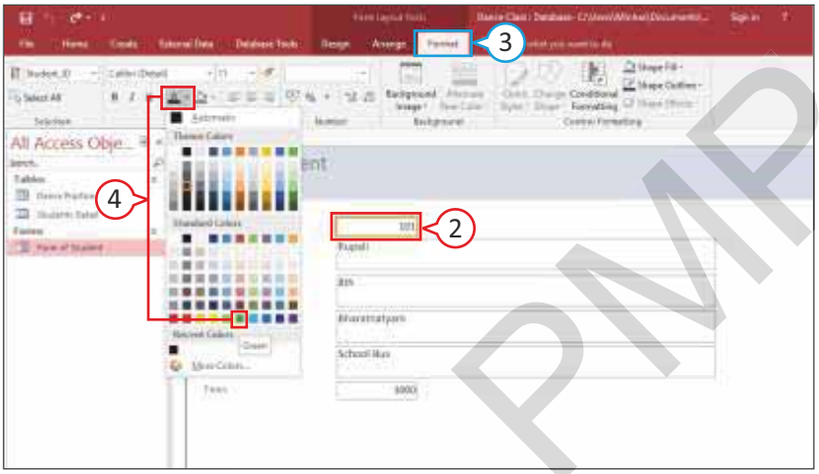
1. Click on **View**.
2. Click on **Layout View**.

- Access displays the form as it originally appears, but each element is editable.

To return to Form view, you can click on **View**, and then click on **Form View**.

FIELD FORMATTING OF FORM

You can add formatting to your field and field labels in the form. You can change the font, size, style, alignment, or color of the text. The **Format** tab appears only when you view the form in Layout view.



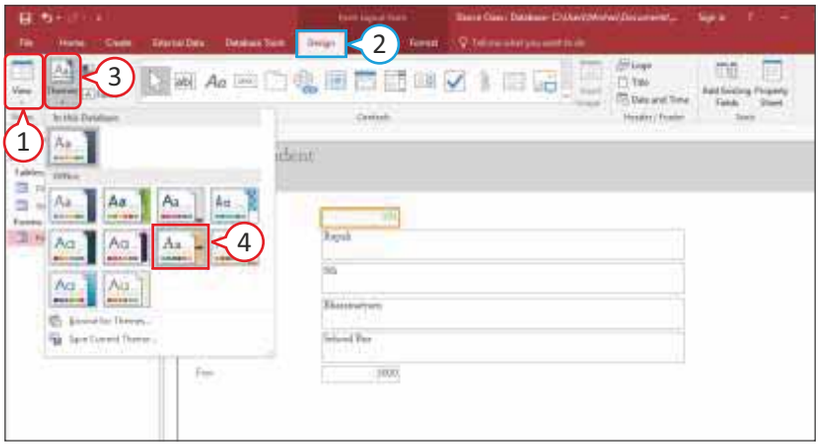
1. Open the form in which you want to format in **Layout** view.
2. Click on the field or label that you want to format.
3. Click on **Format** tab.
4. Click on the formatting that you want to apply, such as font color.

You can also apply another formatting in this field.

Access applies formatting to the field.

APPLYING THEME

You can change the theme of a form using preset designs, fonts, and colors to give it a different look.



1. Open the form that you want to format in **Layout** view.
2. Click on **Design** tab.
3. Click on **Themes**.

The palette of themes appears.

4. Select a new theme by clicking on it.

Access applies new format (theme) to the form.

Self-Evaluation

CHECKLIST

After reading the chapter, I know these points:

	Agree	Disagree
⊙ I know that in a table, the selected data appears highlighted on the screen.	☐	☐
⊙ I know that Find option is used to search a piece of record in tables and forms.	☐	☐
⊙ I know that sorting means arranging the records in ascending or descending order.	☐	☐
⊙ I know that Filtering enables us to filter by multiple fields and specify criteria for as many fields as we like.	☐	☐
⊙ I know that relationships are created and managed in a special database view called Relationships window.	☐	☐
⊙ I know that a form is a view of one or more tables that are designed to be used for data entry and editing.	☐	☐

Exercises

A. Tick (✓) the correct answer.

1. The selected data appears ..... on the screen.
   a. colored ☐ b. highlighted ☐ c. gray ☐
2. The shortcut key for 'Find' option is ..... .
   a. Alt + F ☐ b. Ctrl + I ☐ c. Ctrl + F ☐
3. You can modify the structure of the table in ..... view.
   a. Datasheet ☐ b. Design ☐ c. Query ☐
4. Arranging records in a particular order is called ..... .
   a. filtering ☐ b. sorting ☐ c. forming ☐
5. ..... is designed to enter and edit data in a table very easily.
   a. Table ☐ b. Query ☐ c. Form ☐

B. Write 'T' for True and 'F' for False statements.

1. Find option is used to search a piece of record in tables and forms. ☐
2. Primary key field cannot be deleted in Access. ☐
3. Filtering by form enables us to filter by single field. ☐
4. A relationship works by matching the data in the key field. ☐
5. We cannot move through the record in a form to review or edit any information. ☐

C. Fill in the blanks.

1. ..... check box allows us to find only text that has the same pattern of uppercase and lowercase characters.
2. ..... view and ..... view are the two views in which we can create table.
3. ..... data can help us review and analyze information in our database table.
4. Primary key does not allow to enter ..... values.
5. ..... form shows two parts.

D. Differentiate between the following.

Sorting

.....

.....

.....

Filtering

.....

.....

.....

E. Answer in 1-2 sentences.

1. What is the use of toggle filter option?

.....

.....

2. What do you mean by relationship window?

.....

.....

3. What do you mean by form?

.....

.....

4. What is the use of split form?

.....

.....

F. Answer briefly.

1. What is the use of Find and Replace feature in MS-Access?

.....

.....

.....

2. What do you mean by filtering data by selection and by form?

.....

.....

.....

G. Application-based Question

Ruchi has created three tables. These tables are as follows:

Table 1	Table 2	Table 3
Emp_no, Emp_name	Designation, Department	Emp_no, Contact_no

Now tell between which two tables can she create a relationship and why?

.....

Group Discussion

Divide the students into two groups and discuss the topic– 'Datasheet View vs Design View'.

Online Link

To learn more about tables and forms in Access, visit the website:

https://www.tutorialspoint.com/ms_access/ms_access_objects.htm

Activity Section

Lab Activity

Skill Formation

This activity will make the students create an interactive interface for data entry which enhances their presentation skills.

Open Access and do the following.

a. Create a new database named 'Student' and save it in **'Lab Activity'** folder.
b. Create a table using the Datasheet view, containing following fields in it:

Roll_No	First_Name	Last_Name	Address	Date_of_Birth	Phone_No	Postal_Code

c. Add the following records in the table:

1	Mahesh	Kumar	Delhi	06/08/1997	23456664	110005
2	Suresh	Singh	Faridabad	15/05/1998	32344333	110020
3	Kamal	Sharma	Noida	21/11/1996	26545556	201005
4	Rashmi	Chawla	Ghaziabad	10/10/1998	34355555	110001
5	Aman	Gupta	Delhi	25/12/1995	65456655	110015

d. Save the above table as 'Personal Information', selecting Roll_No as the primary key field.
e. Select the fourth record and delete it.
f. Rename the field 'Address' as 'Postal_Address'.
g. Enter three more sets of records in the table.
h. Delete the field 'Postal_Code'.
i. Create another table in the same database with the following fields in it using the Design view:

Roll_No	Tuition_Fee	Dance_Fee	Computer_Fee	Late_Fee	Total

j. Add the following records in the table:

1	5000	700	500	0	6200
2	4500	1000	500	100	6100
3	6000	900	1000	500	8400
4	5000	600	500	0	6100
5	6000	500	900	100	7500

k. Save the table as 'Fee Details' without keeping any of the fields as primary key.
l. Using Form Wizard, make a form with any one of the above tables.
m. Save the form.
n. Close the database window and exit Access.

Discover More

Popular Database Management Systems

DATABASE	DEVELOPER	OPERATING SYSTEM	COMPUTER TYPE
Access	Microsoft Corporation	Windows	PC, Server, Mobile Devices
SQL Server	Microsoft Corporation	Windows, Linux, Server	PC, Server
MySQL	Oracle Corporation	Windows, Linux, Mac OS	PC, Server
Oracle	Oracle Corporation	Windows, Linux, Solaris	PC, Server, Mainframe, Mobile Devices
Essbase	Oracle Corporation	Windows, Linux	PC, Server, Mobile Devices
FileMaker	FileMaker Inc.	Windows, Mac OS	PC, Server
Sybase	Sybase Inc.	Windows, Unix	PC, Server, Mobile Devices
Db2	IBM	Windows, Linux, Unix	PC, Server, Mainframe

4 Access – Query and Report

OBJECTIVES

After completing this chapter, you will be able to:

- Understand query and its types.
- Learn to create, run and save a query.
- Understand different query window options.
- Create simple report.

In your previous chapters, you learnt how to work in a table, create relationship between tables, and create forms. In this chapter, you will learn how to create Queries and Reports in Access.

Query

Query is a request for specific data from the database. The capability of querying a database is one of the most powerful database features. In other words, a query is simply a question represented in a way that Access can understand. If you want to find the answer to a question, you will have to create a corresponding query first. Once your query has been created, you instruct Access to run the query that is to perform the steps through which you can obtain your answer. The answer will then be displayed in the Datasheet view.

TYPES OF QUERIES

There are mainly four types of queries: **Simple** query, **Unmatched** query, **Duplicate** query, and **Cross Tab** query.

Simple Query : Simple query is used to ask some particular questions about data in the database.

Unmatched Query : Unmatched query is used to find the records from one table that do not have corresponding values in the second table.

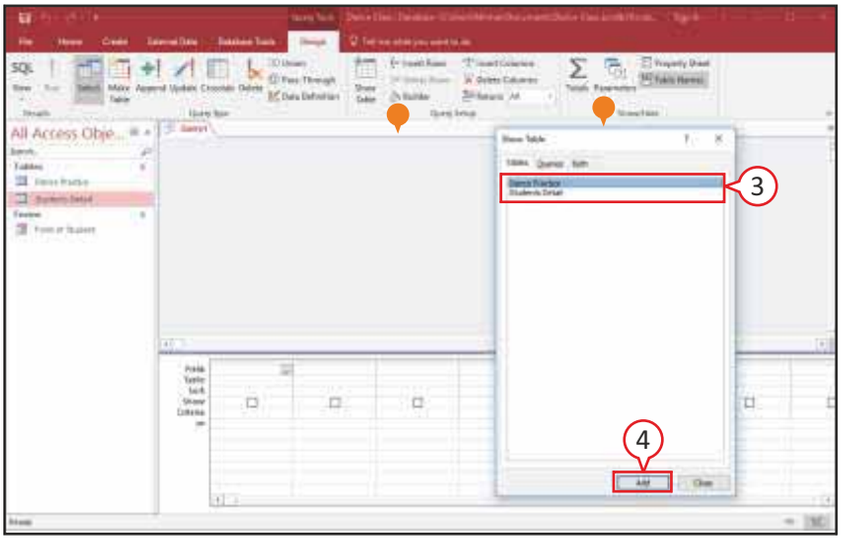
Duplicate Query : Duplicate query is used to display the records that have same values for one or more of the specified fields.

Cross Tab Query : Cross Tab query is used to display the same data, but groups the data both horizontally and vertically so that the datasheet can be more compact and easier to read.

Creating a Query

You can use Design view to manually create a selected query. When you use Design view, you have more control over the details of the query design. Perform the following steps to begin creating a query.

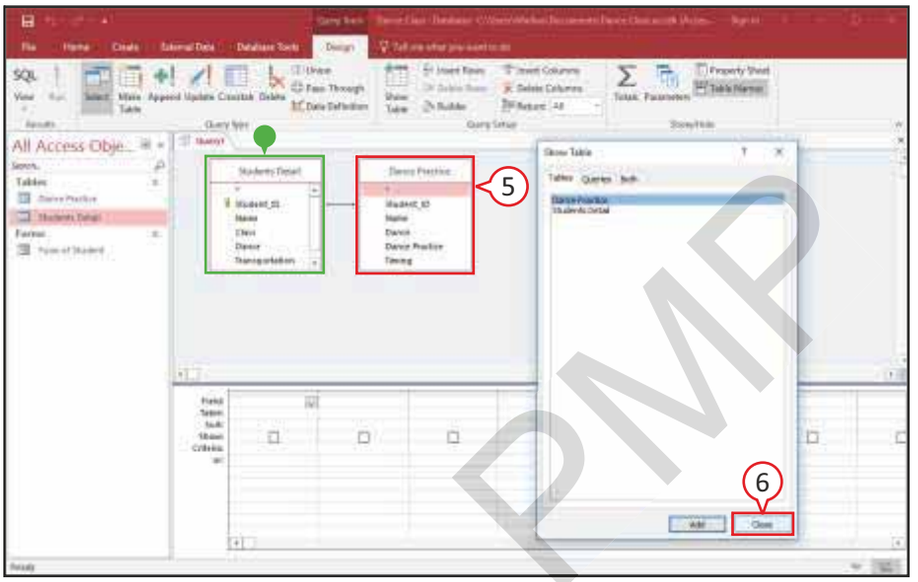
1. Click on **Create** tab.
2. Click on **Query Design**.



- The **Select Query** window and **Show Table** dialog box appear.

  Lists of all the tables in your database are shown in this area.

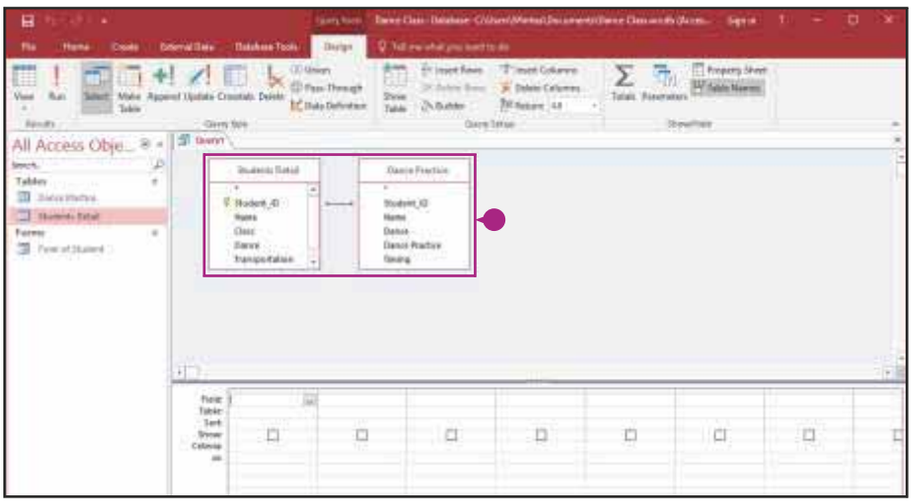
3. Click on a table that contains information you want to use in your query.
4. Click on **Add** to add the table to your query.



- A box appears in the **Select Query** window, displaying the fields for the table you selected.

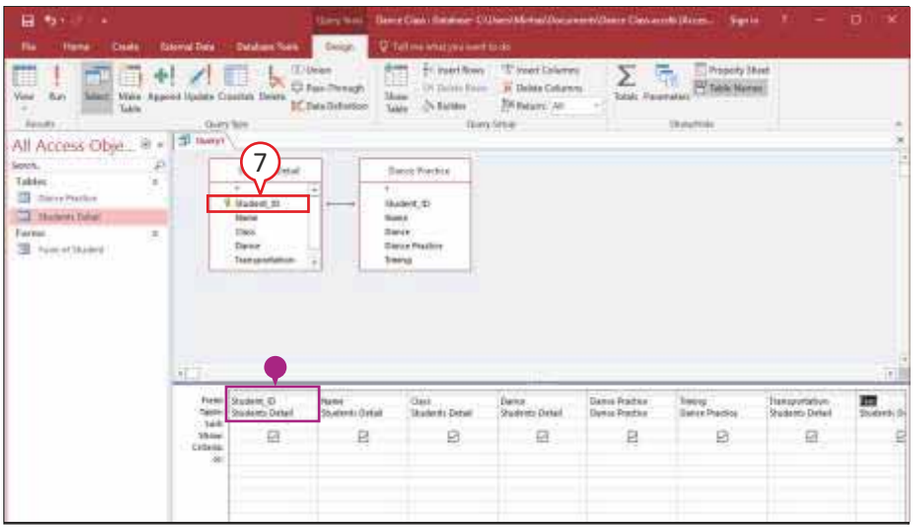
5. Repeat steps **3** and **4** for each table you want to use in your query.
6. Click on **Close** button to hide the **Show Table** dialog box.

In case of multiple tables, the field lists are joined by a line. These joined lines link key field that shares the same field name. The joined lines indicate table relationships that relate the data in one table to the data in the other.



- Each box in this area displays the fields for one table.

If you add a table accidentally to the query and want to delete it, click on the table and then press the **Delete** key. This removes the table from the query window, but not from the database.



7. Double-click with the left mouse button on a field you want to include in your query.

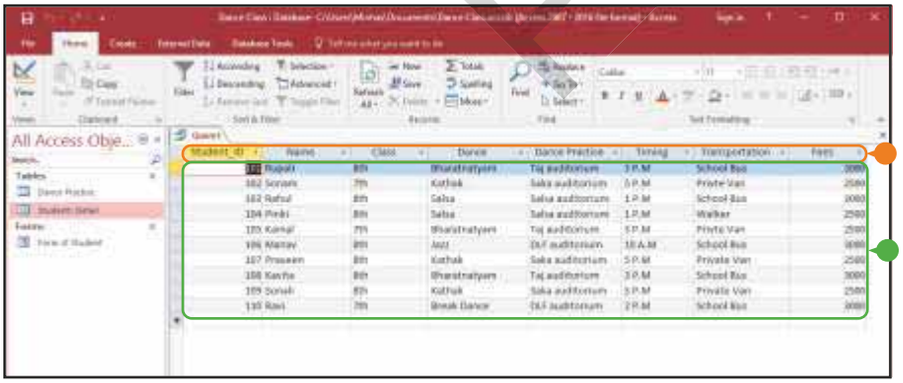
You can also drag the field into first empty column in the query grid.

- The field you selected and the table that contains the field are displayed in this area.

8. Repeat step **7** for each field you want to include in your query.

RUNNING A QUERY

After the query is created, you need to run the query to produce the results. You should click on **Run** to achieve this purpose. Access will then perform the steps that are necessary to obtain and display the answer. The set of records that make up the answer will be displayed in Datasheet view. Though it might look like a table, it is not actually so. The data stored in the existing table is used to construct the records. If you were to change the data in the Students Detail table and then re-run this same query, the result would reflect the changes.



1. Click on **Run** ( ) in the **Result** group from **Design** tab to run the query.

The result of the query appears in Datasheet view.

- This area displays the names of the fields you included in the query.
- The records that meet the conditions you specified appear in this area.

SAVING A QUERY

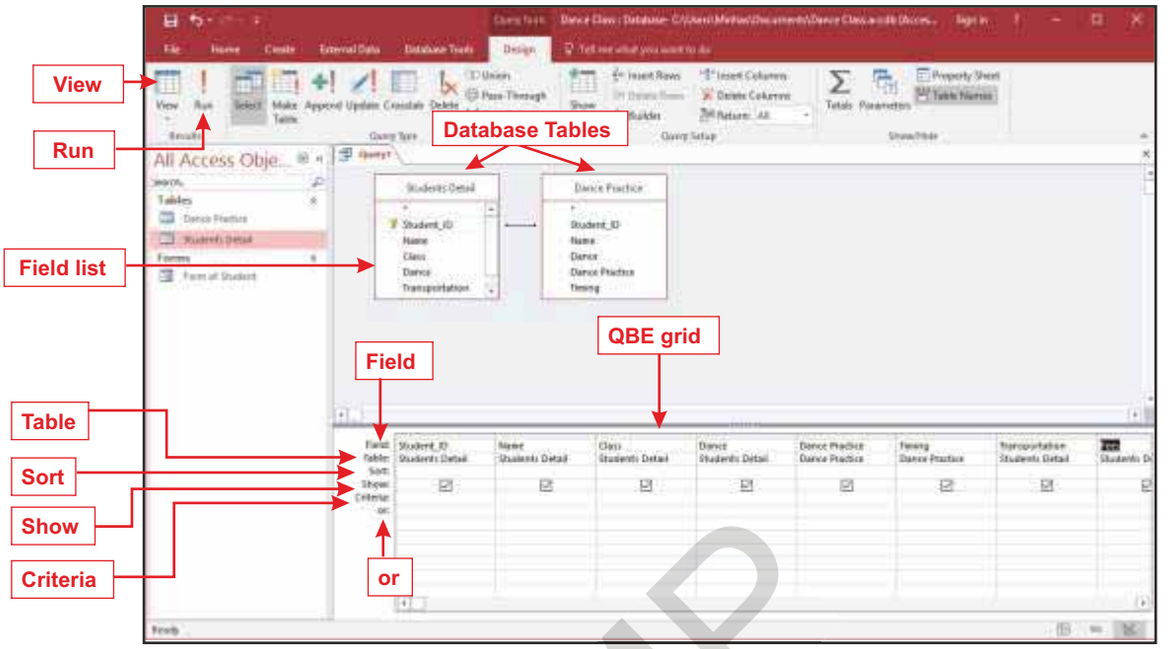
Creating and running a query is a way of extracting information from a database without changing the data that is stored in the database tables. A query does not store data; it retrieves data that is stored in tables. Sometimes, to share that table with others, you may want to save the result of the query as a new table.

1. Press **Ctrl + S** from the keyboard. The **Save As** dialog box appears.
2. Type a name for your query, and click on **OK** button to save your query.

When you finish viewing the results of your query, click on **Close** (**x**) button to close the query.

Understanding Query Window Options

The **query window** is divided into two panes. The top pane displays the tables selected for the query. The bottom pane displays a design grid where you can add fields to the query and also specify the criteria.



Database Tables: While creating a query, you can pull fields from more than one table, provided they have a relationship between them.

Field list: The complete field list of each table appears in a separate window.

View: Clicking on this option will switch between Design view and Datasheet view.

Run: Clicking on this option will produce the result of query.

QBE grid: **Q**uery **B**y **E**xample grid contains the fields chosen to be in query—one field per column.

Field: This row shows the field name.

Table: This row shows the name of the table from where the field has been pulled.

Sort: This row indicates the field(s) by which the results should be sorted.

Show: Any field can be omitted from the results by deselecting its checkbox from this row.

Criteria: This row holds the filters you want to apply.

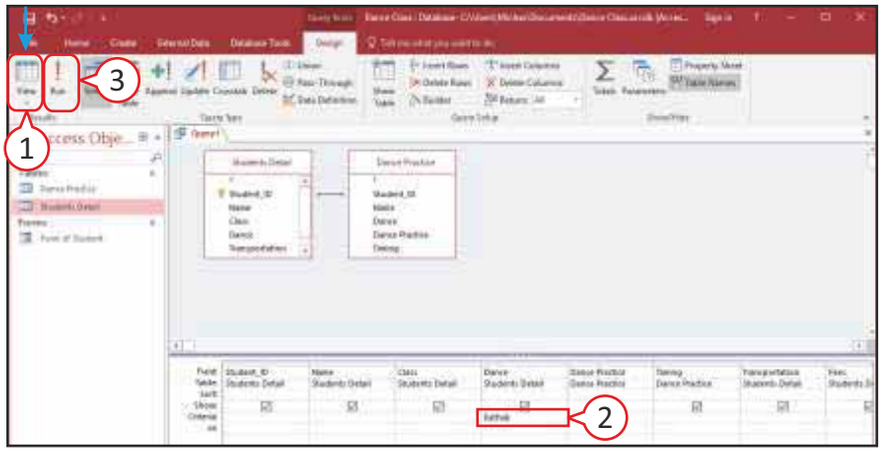
Or: Additional criteria can be entered in this row.

USING CRITERIA IN QUERY

You can find specific records in your database by using criteria. **Criteria** are conditions that identify the records you want to find.

Use Text Data

While using queries, you usually look for the records that satisfy some criterion. You might want to find the list of students who are learning Kathak dance. To enter criteria, enter the name of dance in the **Criteria row** in the design grid below the field name to which the criterion applies. For example, to indicate that the name of the dance must be Kathak, you must first add the dance field to the design grid. You would then type Kathak in the Criteria row below the Dance field, and click on **Run** to run the query.



1. Open the query in **Design View**.
2. Click in the **Criteria** field and type the data that you want to view.

In this example, we list a Dance name (Kathak) as the criterion.

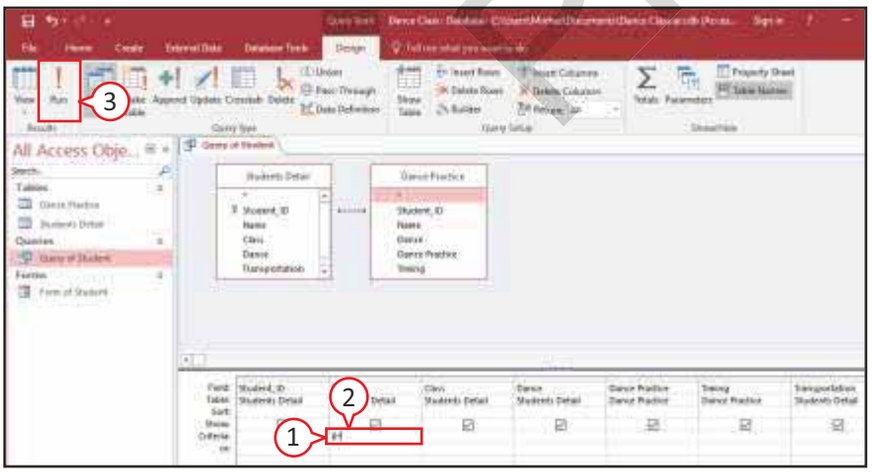
3. Click on **Run** to see the result.

The table now shows only the records matching the query.

- This example lists records in which only **Kathak** is listed as the **Dance** name.

Use Wildcards in Query

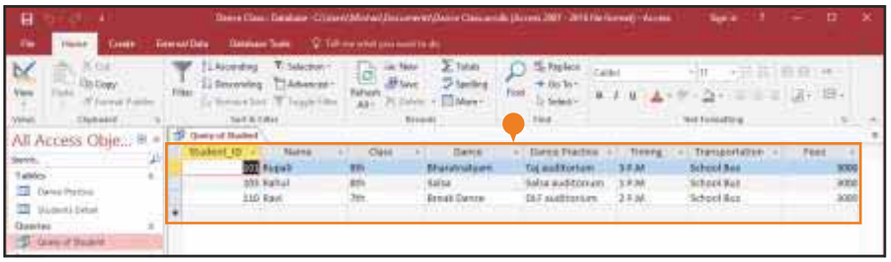
Wildcards are symbols that represent any character or combination of characters. Access provides some special wildcards. The **asterisk** (*) represents any collection of characters. Thus, **R*** represents the letter R, followed by any collection of characters. The other wildcard symbol is the **question mark** (?) which represents any individual character. Thus **R?vi** represents the letter R, followed by any single character that follows the letter, such as in 'Ravi'.



1. Click on the **Criteria** area for the field you want to use to find specific records.
2. Type the criteria **R*** and then press **Enter** key.

Access may add quotation marks (" ") or number signs (#) to the criteria you type.

3. Click on **Run**.



- The result is displayed.

*Only the students whose names start with **R** are displayed.*

Activity Time: *Try the usage of second wildcard (?) in the lab.*

Use Compound Criteria

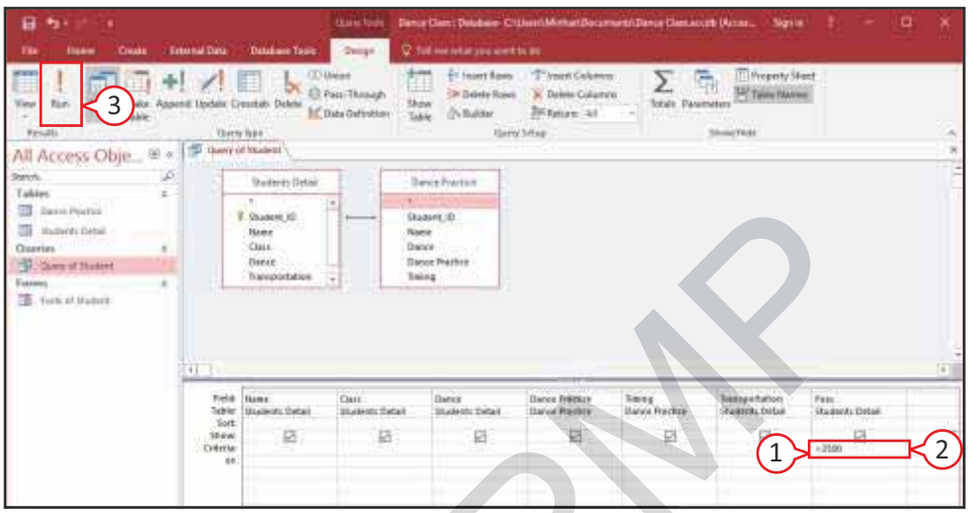
Often, more than one criterion might be available to satisfy the data you are searching. This is called **compound criteria**. There are two types of compound criteria.

In the **AND criterion**, each individual criterion must be true for the compound criteria to be true. The **OR criterion** is true provided either of the individual criterion is true.

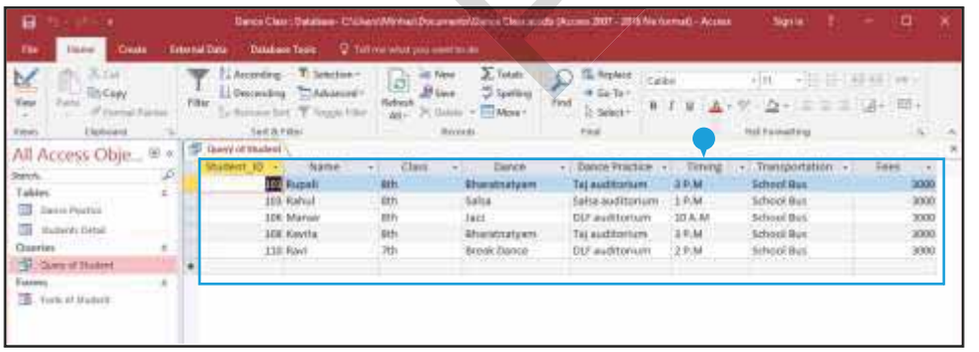
Use Compound Operator

If you do not specify a criteria, Access assumes that the criteria you have entered involve equality (exact matches). If you want something other than the exact match, you can specify ranges of value by using comparison operator. The comparison operators are **>** (greater than), **<** (less than), **>=** (greater than or equal to), **<=** (less than or equal to), and **<>** (not equal to).

Let us find the students whose total fee is more than 2500.



1. Click the **Criteria** area for the field you want to use to find specific records.
2. Type the criteria (**>2500**).
3. Click on **Run**.



- The result of the query appears.

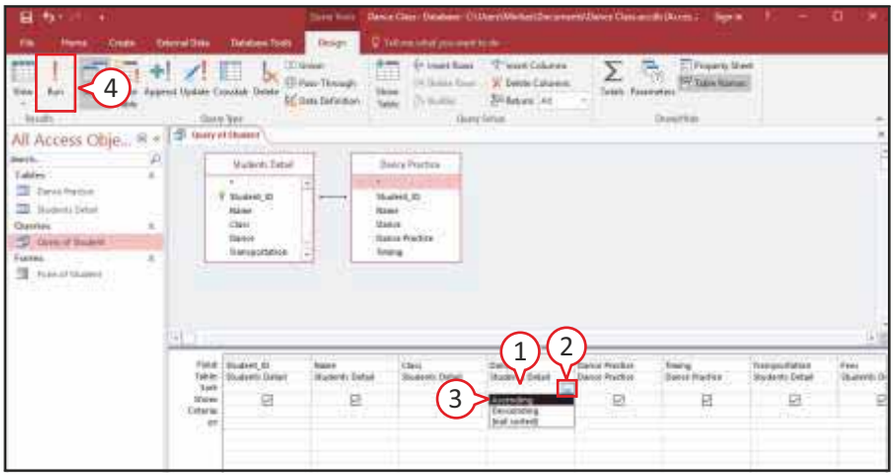
In this example, Access listed students whose total fee amount is more than 2500.

SORTING DATA IN QUERY

Sorting can be very important in queries. For example, you may want to see the dance forms in which the students are participating and would like them to be arranged in an alphabetical order.

You have to sort the records to order them in the answer to a particular query. The field or fields on which the records are sorted is called the **sort key**. If you are sorting more than one field, the more important field is called the **major key** (also called the **primary sort key**), and the less important field is called the **minor key** (also called the **secondary sort key**).

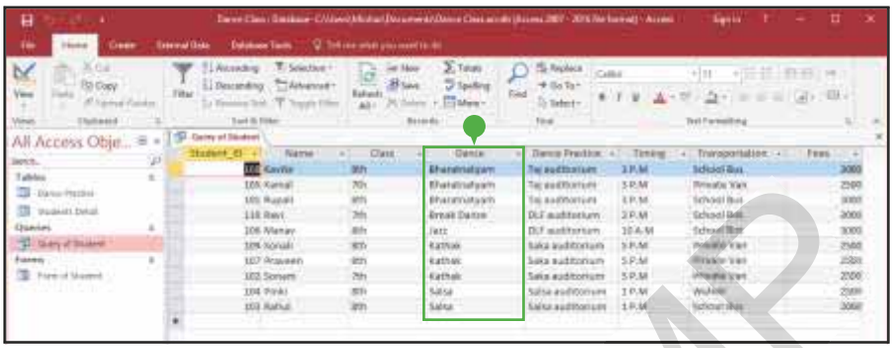
Let us sort the dance forms in alphabetical order.



1. Click on the **Sort** row for the field you want to sort.

A drop down arrow button appears.

2. Click on the drop down arrow button.
3. Click the way you want to sort (*Ascending, Descending, Not Sorted)*.
4. Click on **Run**.



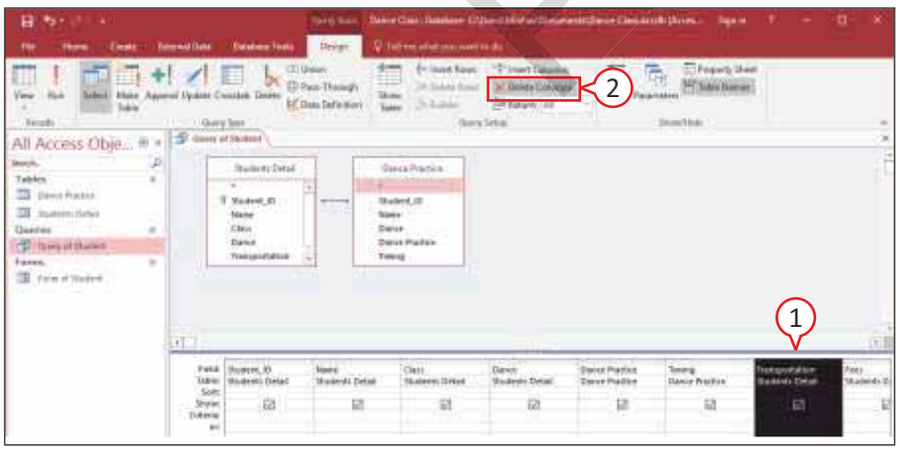
- The record appears in the order you specified.

*In this example, the **Dance** field data is sorted in alphabetical order.*

Repeat steps **1** to **3**, selecting **(not sorted)** in step **3**, if you do not want to use a field to sort the query results any longer.

DELETING A FIELD IN A QUERY

You can delete an unwanted field from your query. Deleting a field from a query does not delete the field from the table you used to create the query.



1. Position the mouse directly above the field you want to delete.

   Mouse pointer changes to (⬇).

   Then click to select the field.
2. Click on **Delete Columns**.

The field disappears from your query.

HIDING A FIELD IN A QUERY

You can hide a field without removing it from the query grid.

1. Deselect the check box for the field you want to hide in the **Show** row of query grid.
2. Click on **Run**.

The datasheet opens, showing the query results. The field you hide does not appear.

Update Your Knowledge

You can sort data in any specified sequence—alphabetically, numerically, or by data.

Creating a Report

A **report** is a database object used to display data from a query and/or table in an appealing way. Reports are specially designed to be printed. A report can have more elaborate formatting and layouts than other objects that you print.

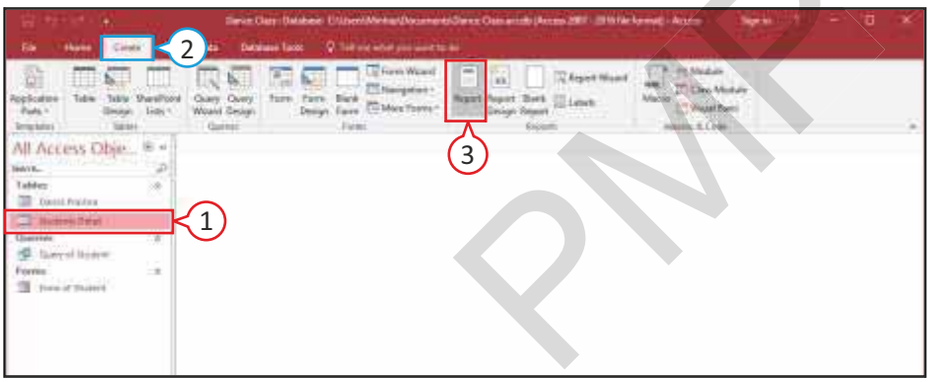
You can create basic reports with default settings, or you can create custom layouts by using the exact settings that work best for your situation.

The portion at the top of the report called **page header** contains a custom title. The contents of this page header are displayed at the top of each page. The **detail lines**, which are the lines printed for each record contain only those fields you specify and in the order you specify.

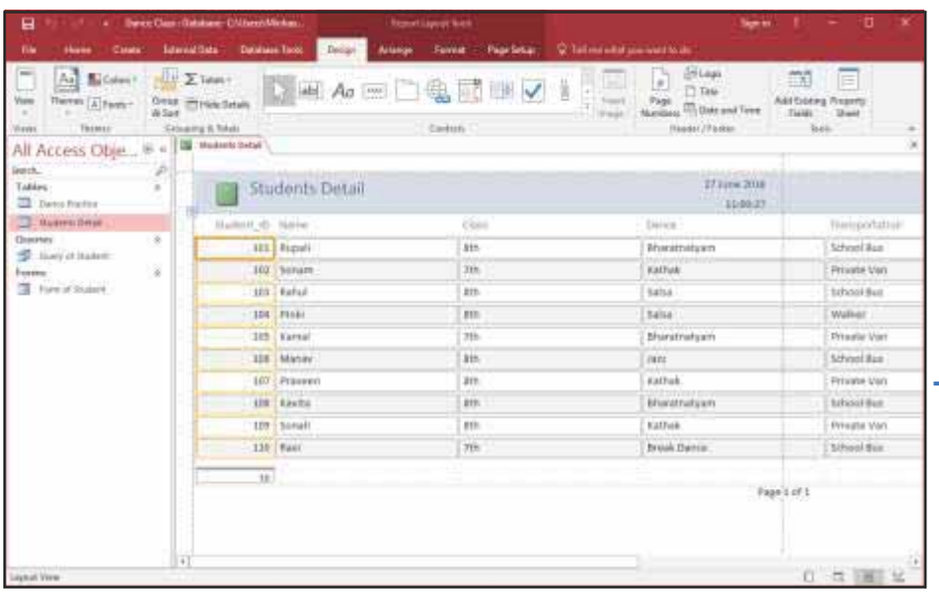
A report consists of information that is pulled from tables or queries. The tables or queries that provide the underlying data are also known as the **record source** of the report.

CREATING SIMPLE REPORT USING REPORT TOOL

You can create a simple report using Report tool as it generates a report immediately, without prompting you for information. The report displays all the fields from the underlying table. You can save the report, and modify it in Layout view or Design view so that it better serves your purpose.



1. Click on the table or query on which you want to base the report from the **Navigation Pane**.
2. Click on **Create** tab.
3. Click on **Report** from **Reports** group.



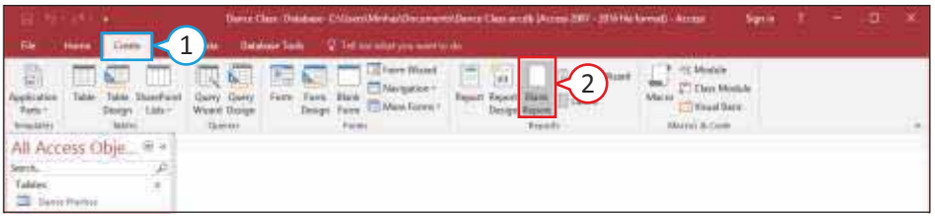
*Access builds the report and displays it in **Layout view**.*

After viewing the report, you can save it, and then close both the report and the underlying table that you used as a record source.

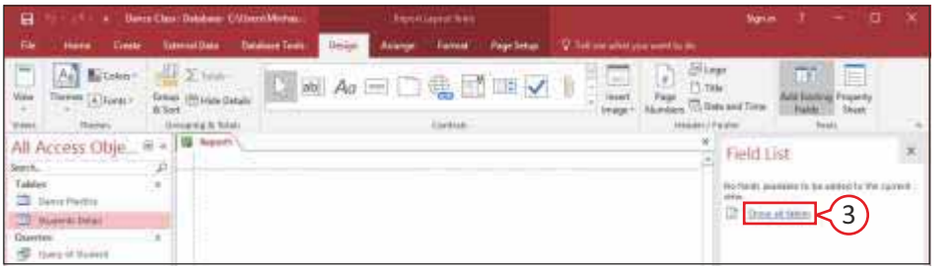
As per the project, part-3: final report of the database is ready.

CREATING A BLANK REPORT

Blank Report is a very quick way to build a report if you want to put only a few fields on your report.

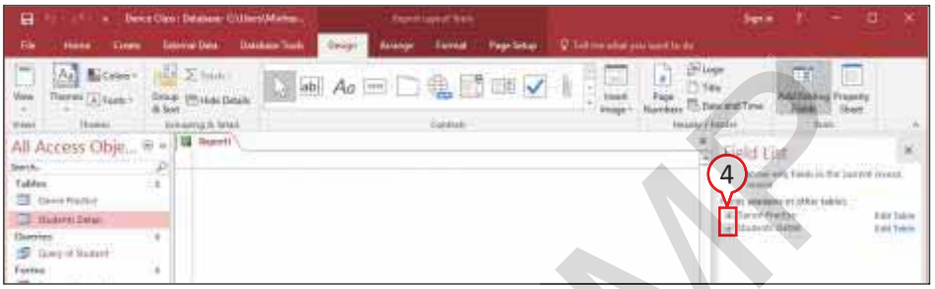


1. Click on **Create** tab.
2. Click on **Blank Report** from **Reports** group.

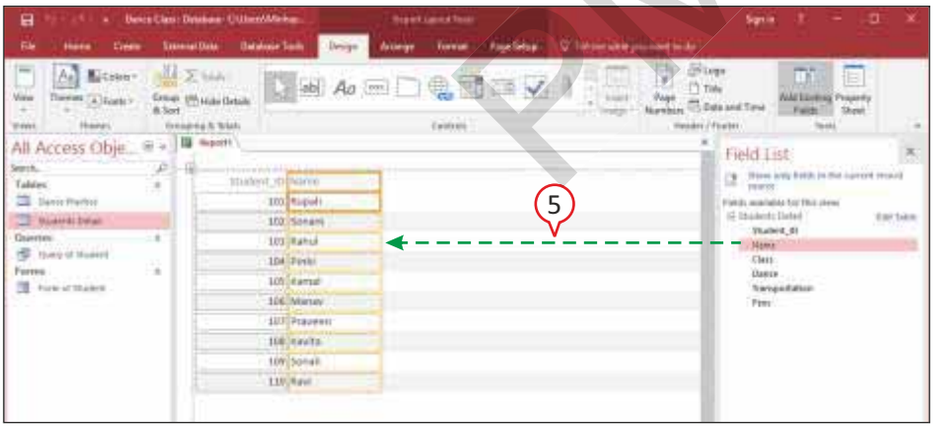


*A blank report is displayed in the Layout view, and the **Field List** pane is displayed on the right side of the Access window.*

3. Click on **Show all tables**.



4. In the **Field List** pane, click on the **plus sign** that precedes the table name which you want to see on the report.



5. Drag each field onto the report, one at a time, or hold down **Ctrl** key and select several fields and then drag them onto the report at the same time.

After dragging all the fields, you can use the tools in the **Controls** group on the **Format** tab to add a logo, title, page numbers, or the date and time to the report.

Update Your Knowledge

- You can design your own reports from scratch by using either **Layout view** or **Design view**. However, Layout view is much easier to work with because it resembles the actual appearance of report more closely.
- The default page size for a report is the **Letter size**, which is **8.5 inches × 11 inches**. You can set the page to any size you like as well as switch between **portrait** and **landscape**.

Self-Evaluation

CHECKLIST

After reading the chapter, I know these points:

	Agree	Disagree
◦ I know that a query is a question represented in a way that Access can understand.	☐	☐
◦ I know that there are mainly four types of queries: Simple query, Unmatched query, Duplicate query, and Cross Tab query.	☐	☐
◦ I know that after creating a query, we need to run it for producing the result.	☐	☐
◦ I know that criteria are conditions that identify the records we want to find.	☐	☐
◦ I know that a report presents the data in an organized manner.	☐	☐
◦ I know that the top portion of the report is called page header.	☐	☐
◦ I know that a simple report can be created using Report tool as it generates a report immediately, without prompting us for information.	☐	☐

Exercises

A. Tick [✓] the correct answer.

1. ..... query displays the same data, but groups the data horizontally and vertically.
   a. Cross tab ☐ b. Simple ☐ c. Duplicate ☐
2. ..... window displays the fields for the table we selected to apply query.
   a. Select query ☐ b. Show table ☐ c. Show query ☐
3. While sorting more than one field, the more important field is called ..... key.
   a. Minor ☐ b. Enter ☐ c. Major ☐
4. The special wildcards for query provided by Access are ..... .
   a. * and / ☐ b. * and ? ☐ c. + and ? ☐
5. ..... is a database object for displaying data from a table in an appealing way.
   a. Report ☐ b. Query ☐ c. Datasheet ☐

B. Write 'T' for True and F' for False statements.

1. In Microsoft Access, there are mainly four types of queries. ☐
2. We cannot remove the table from the query once it is added. ☐
3. We can sort data in a specified sequence— alphabetically, numerically, or by data. ☐
4. Wildcards are conditions that identify the records we want to find. ☐
5. Page header provides the data for creating reports. ☐

C. Fill in the blanks.

1. A query can be created using ..... view.
2. The conditions that identify the records we want to find are called ..... .
3. ..... are symbols that represent any character or combination of characters.
4. The field on which the records are sorted is called the ..... .
5. The lines that are printed for each record are called ..... in Report.

D. Differentiate between the following.

Major Key	Minor Key
.....	.....
.....	.....
.....	.....

E. Answer in 1-2 sentences.

1. What do you understand by query?

   .....

   .....

2. What do you mean by compound criteria?

   .....

   .....

3. Why do we need sorting?

   .....

   .....

4. What do you mean by report?

   .....

   .....

F. Answer briefly.

1. Explain the query window options.

   .....

   .....

   .....

2. What is the use of wildcards in a query?

   .....

   .....

   .....

G. Application-based Question

The librarian of your school has asked you to make a database table in Access so that he/she could quickly enter the records of books which are taken by the students to their homes and then submitted back after a few days. Make a list of fields you would like to add to your table.

.....

Group Discussion

Divide the students into groups and discuss the importance of query in the database.

Online Link

To learn more about query and report in Access, visit the website:

https://www.multisoftsystems.com/assessments/ms-access-practice-test

Activity Section

Lab Activity

Create a database 'Company' and save it in 'Lab Activity' folder. Create a table 'Employee' in design view and create following fields:

Field name	Data type	Description
Emp_No	Number	Employee's identification number
Emp_Name	Short Text	Employee's name
Designation	Short Text	Designation of the employee
Pay_Scale	Number	Pay scale of the employee

a. Select 'Emp_No' as the primary key and save the table structure.

b. Create a form for the table and enter the data as given below.

Emp_No	Emp_Name	Designation	Pay_Scale
101	Payal	Manager	60000
102	Praveen	Sr Executive	50000
103	Kamal	Tech head	75000
104	Gopal	Production Manager	60000
105	Aman	Designer	40000
106	Priya	Sales Manager	50000

c. Click on the Create tab and click on the Query Design button in the Database window.

d. Click on the table name 'Employee' and click on Add button.

e. Click on Close button.

f. Create a query to display the details of the employees whose name started with **'P'**.

g. Run the query and save it as 'Query 1'.

h. Generate the report for the above query.

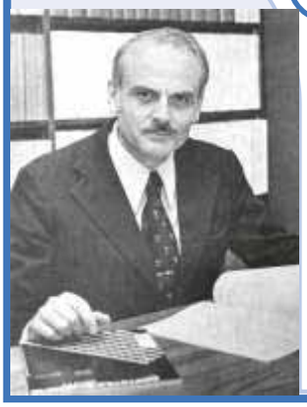
Skill Formation

This activity enhances the data creating and visualization skills of the students.

Technology Trailblazers

Edgar Frank Codd

? Creator: Relational Database Design SQL



Edgar Frank Codd created relational database design which is the structure for most of the small and large databases used today.

After attending college in England and serving in the Royal Air Force, he began working at IBM as a programming mathematician. He developed and promoted his relational model in a series of research papers beginning with his 1969 IBM report, "Derivability, Redundancy, and Consistency of Relations Stored in Large Data Banks".

As a result of his research, IBM introduced the first version of **Structured Query Language (SQL) in 1982**.

5 OpenShot Video Editor

OBJECTIVES

After completing this chapter, you will be able to:

- Understand OpenShot video editor and its components.
- Learn to add images, videos, music files in OpenShot.
- Learn to add or remove transition and visual effects.
- Learn to add title, caption and edit media clips.
- Save and export OpenShot project.

Movie

Movie or **video** is a recording of moving images that narrates a story. People watch movies on a screen or television.

Movies are recorded using **cameras** and **sound recording equipments**. Nowadays, most smartphones have the option to record videos. After recording, the movie is edited on professional editor software.

FORMAT OF MOVIES

There are mainly two formats of movies.

Real Movies: These movies are made using real people and location. Camera is used to shoot these movies.

Animation Movies: These movies are made of a series of still images displayed in a quick sequence. The images used in these movies are either drawn by hand or generated on the computer.

MEDIUM OF MOVIES

You can watch the movie via two mediums — cinema hall and online platform.

Cinema Hall: Whenever a movie is released in the cinema hall, the audience can watch it after purchasing its tickets.

Online Platform: When a movie is released on the online platform (also called OTT platform) like Amazon Prime, Netflix, etc., the viewer can watch it online on laptop, smartphone or smart TV after paying subscription charges for the associated online platform.

STORAGE OF MOVIES

Movies can be stored on various storage devices or media like Film Reel, Video Cassette, DVD, Blu-ray Disc, Hard Disk and Cloud Storage.

EDITING OF MOVIES

Just like we can edit the images to enhance them using image editing software like Photoshop, GIMP, etc., movies are also edited to add special effects and make them more appealing by using movie editing software.

There are several popular software program for editing a movie like Final Cut, Microsoft Movie Maker, Apple iMovie, Adobe Premiere, KineMaster, Lightworks, OpenShot, etc.

In this chapter, we will learn about OpenShot movie editing software.

OpenShot Video Editor

OpenShot is an **open-source video editor** software. It is available for all platforms like Windows, Linux and Mac. You can easily combine multiple images, video clips and audio clips into a single file, and then export the combined video to many common video formats.

OpenShot is non-linear editing software, which means that the original file that was taken from your hard drive will not be modified in any way. OpenShot creates its own different video file for editing so that if you want, you can create several different movies using the same source file.

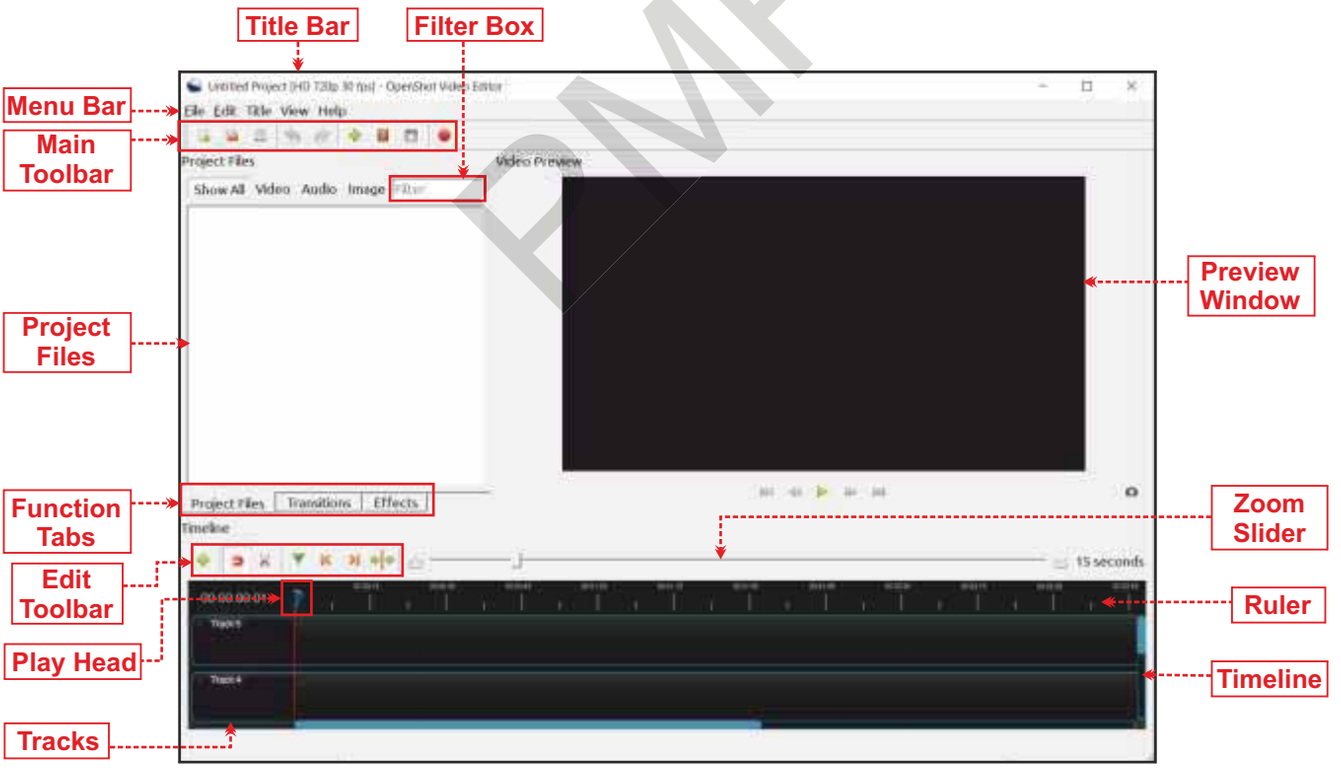
STARTING OPENSHOT

By default, OpenShot is not installed in your computer. You have to download it from http://www.openshot.org and install it on your computer. Once installed, follow these steps to open OpenShot in Windows 10.

1. Click on **Start** icon to open Start menu *(or press)*. It displays a list of all installed programs.
2. Scroll to display **OpenShot Video Editor** and click on it. *The OpenShot app opens.*

UNDERSTANDING OPENSHOT WINDOW

To work in OpenShot, you must understand its interface.



Title Bar: It shows the name of the displayed project. It also contains Minimize, Maximize and Close buttons on the extreme right side.

Menu Bar: It contains various menu options such as File, Edit, Title, View and Help.

Main Toolbar: It contains buttons to open, save, and export your video project.

Filter Box: It is used to filter the list of items in the project. Enter a few letters of what you are looking for, and the results will appear in this box.

Project Files: This area shows all audio, video, and image files that have been imported into your project.

Preview Window: It enables you to view the entire edited video. You can use the buttons underneath this window to play, pause, rewind, forward, move to end or begin the video.

Function Tabs: These tabs are used to switch between Project Files, Transitions, and Effects.

Timeline: It is used to look at the sequence or ordering of the clips in your project. It also shows video effects that have been added in the project.

Ruler: The ruler shows the time-scale for your video.

Play Head: Red line with a blue balloon on the top is the play head. It represents the current playback position.

Zoom Slider: It is used to adjust the time-scale of your timeline.

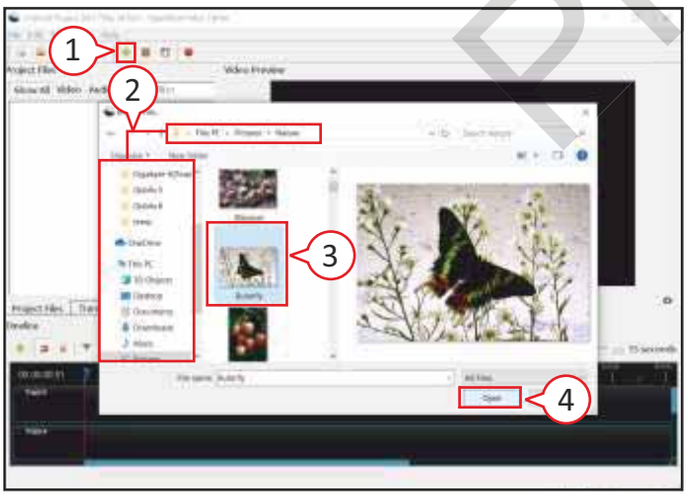
Edit Toolbar: Buttons in this toolbar are used for editing, trimming and splitting clips that have been added on the timeline.

Tracks: Tracks are used to layer videos and images. There are unlimited tracks in OpenShot which can be added or removed. The topmost track is the top layer, and the bottom track is the bottom layer. OpenShot blends each layer together.

Adding Photos, Videos and Audio

To work in OpenShot, you have to add videos, photos and audio files.

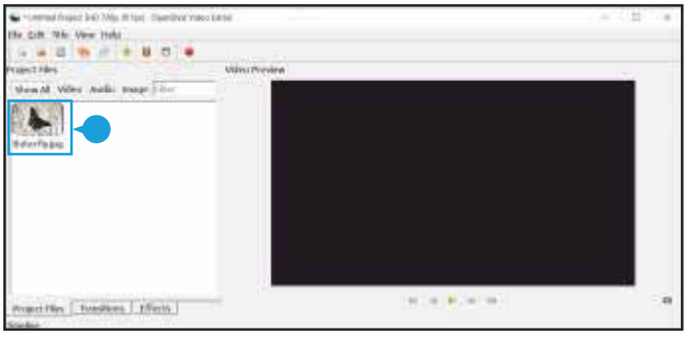
ADDING PHOTO



1. Click on **Import File** [ ] button *(or press Ctrl+F)*.

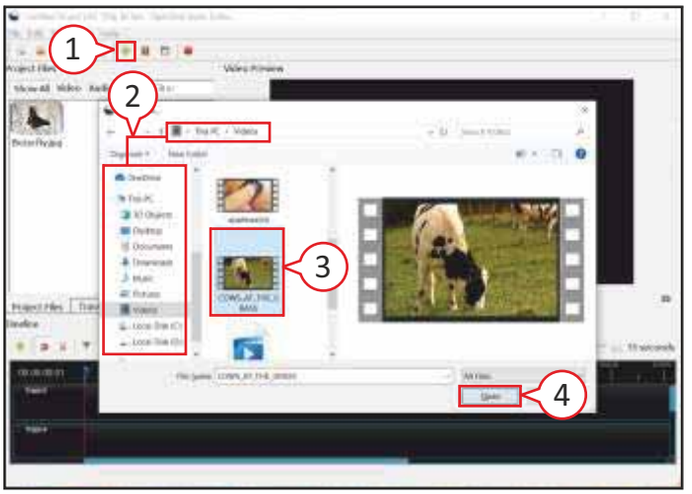
Import File dialog box appears.

2. Navigate the folder from which you want to add photos.
3. Select the picture that you require.
4. Click on **Open**.



- The selected image gets added in the **Project Files** of OpenShot.

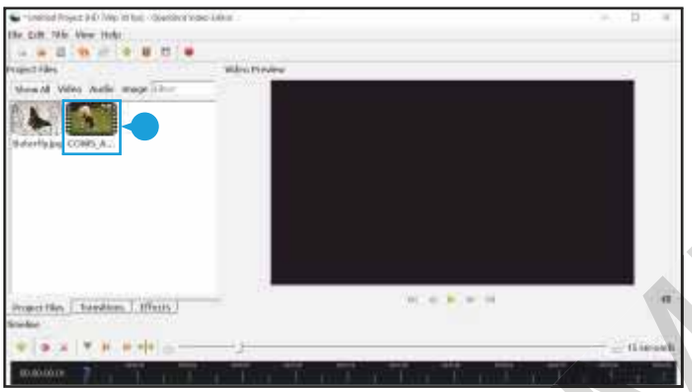
ADDING VIDEO



1. Click on **Import File** [ ] button *(or press Ctrl+F)*.

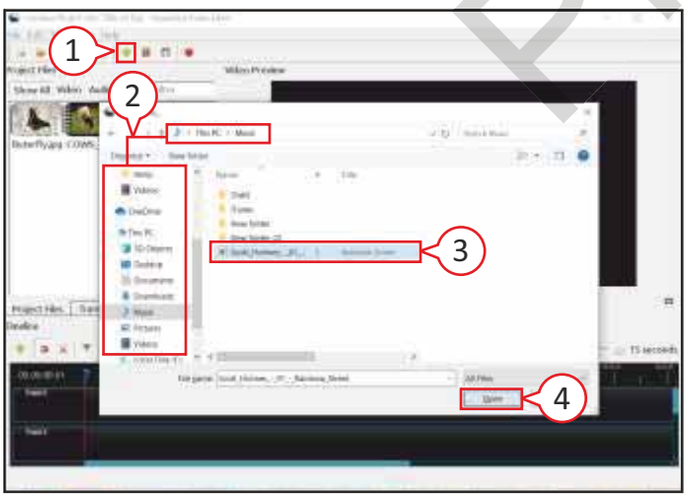
Import File dialog box appears.

2. Navigate the folder from which you want to add video.
3. Select the video file that you require.
4. Click on **Open**.



- The selected video clip gets added in the **Project Files** of OpenShot.

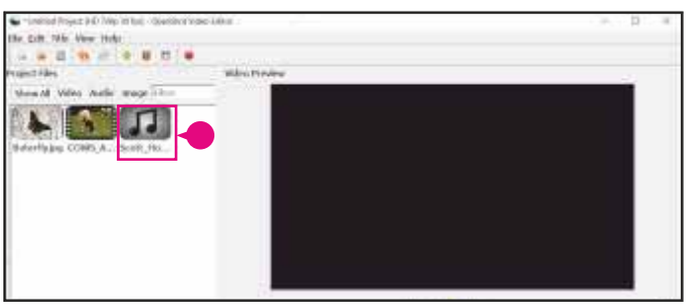
ADDING AUDIO



1. Click on **Import File** [ ] button *(or press Ctrl+F)*.

Import File dialog box appears.

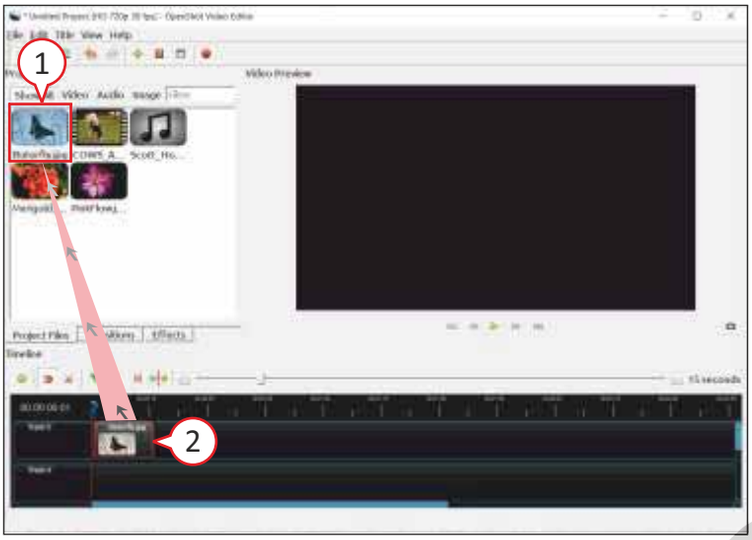
2. Navigate the folder from which you want to add audio.
3. Select the audio file that you require.
4. Click on **Open**.



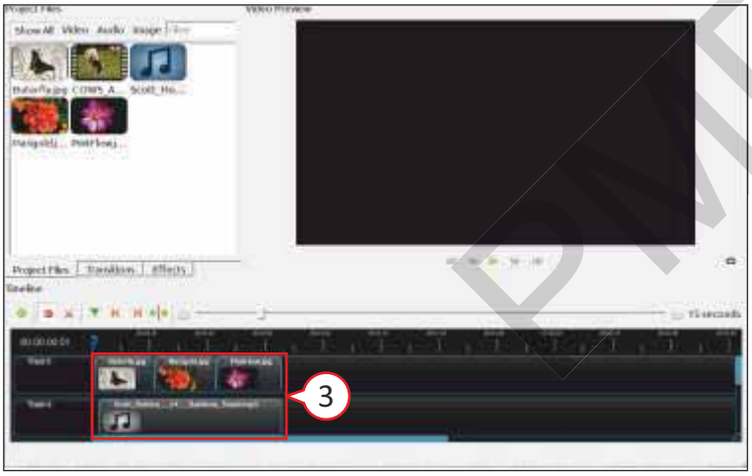
- The selected audio file is added in the **Project Files** of OpenShot.

Adding files to the Timeline

After you have imported selected files or clips, the next step is adding them to the timeline and arranging them. You can drag a clip at any position on the timeline. Multiple clips can be dragged on different tracks on the timeline.



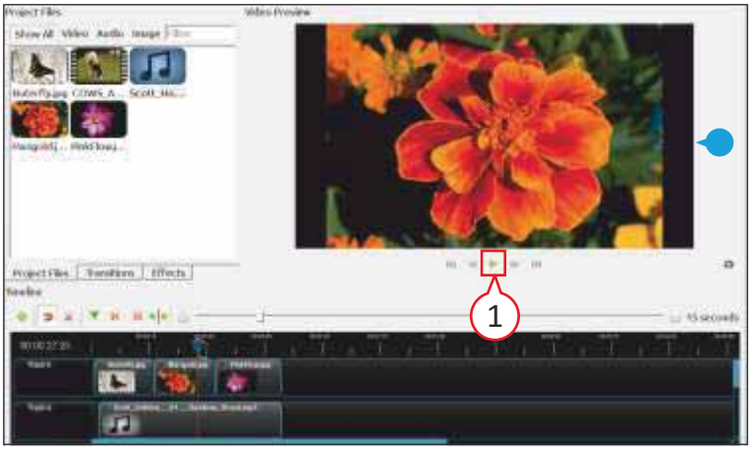
1. Click on the file you want to use in your video.
2. Drag the file to the available track on the timeline.



3. Repeat steps **1** and **2** and drag differ files to the available track on the timeline.

PREVIEWING TIMELINE FILES

After arranging your files on the timeline, you can preview what your video looks and sounds like in the Preview window.



1. Click on **Play** button to preview the movie along with the music in Preview window.

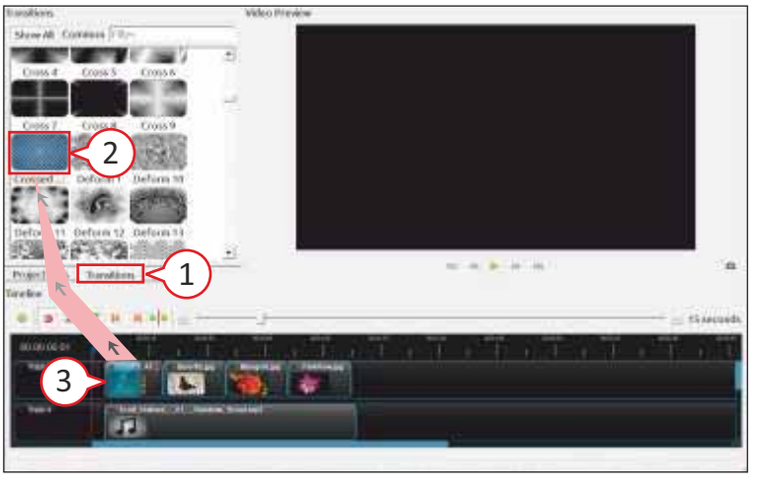
- The video appears in the Preview window.

You can click on Play button again to pause the video.

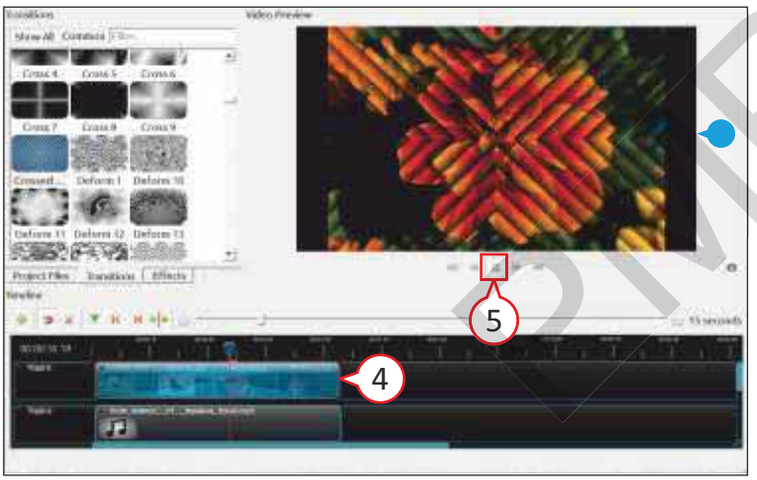
If you want to re-arrange clips, just drag and drop them to move them.

Applying Transitions Effects

A **transition** is a visual effect that appears when your movie plays from one video clip or picture to the next. It gradually fades (or wipes) while moving from one clip to another. On the timeline, transitions are represented by blue rounded rectangles.



1. Click on **Transitions** tab.
2. Click on the desired transition effect.
3. Drag the transition effect on the timeline and position it on the top of the clip.

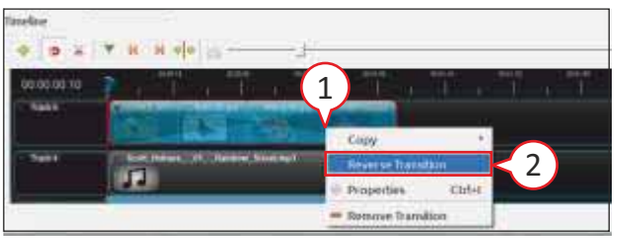


4. Click and drag the side of blue Transition box to change the duration of the effect.
5. Click on **Play** button to see the effect.

- Transition effect appears in the Preview window.

CHANGEING THE DIRECTION

You can change the direction of transition effects either from left to right or right to left. By default, the direction of transition effect is left to right.



1. Right-click on the blue Transition effect box.
2. Click on **Reverse Transition** from the menu that appears.

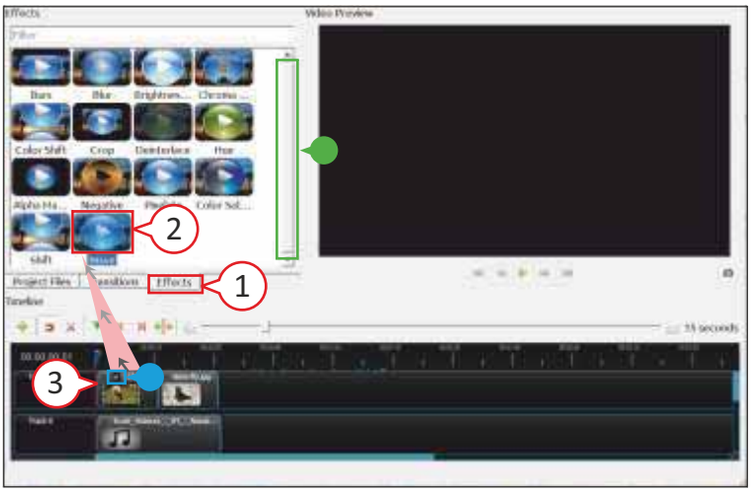
Now, when you click on Play button, you will see the effect in reverse order.

REMOVING TRANSITION EFFECTS

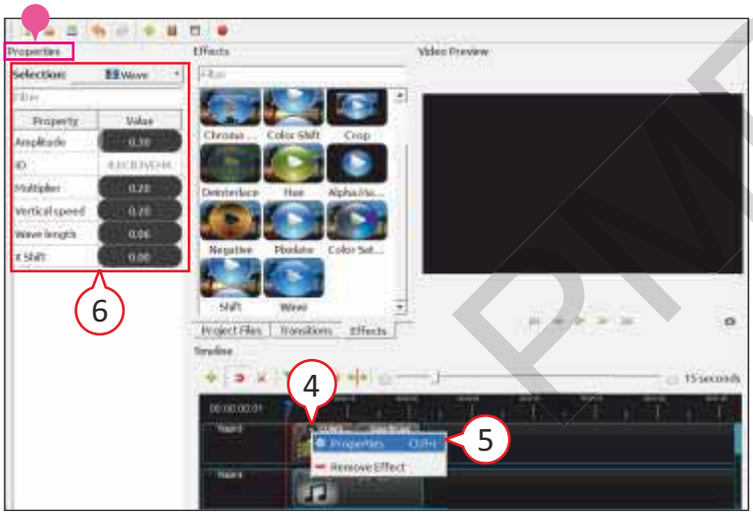
Sometimes after applying a transition, you realize that it just does not work and you decide to remove it; in that case repeat steps **1** and **2** while selecting **Remove Transition** in step **2**. OpenShot removes the transition from the clip or image.

Applying Visual Effects

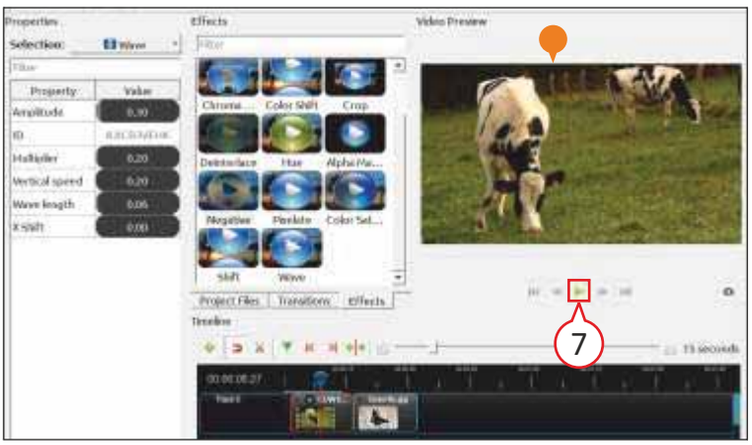
OpenShot allows you to add visual effects to your project. These effects enhance the appearance of your movie and gives it a feel of professional touch. These effects include Bars, Blur, Brightness, Hue, Negative, Pixelate, Wave, etc.



1. Click on **Effects** tab.
- The available effects are displayed. You can scroll through all the available visual effects.
2. Click on the desired effect.
3. Drag the effect on the timeline and position it on the top of the clip.
- OpenShot adds an effect icon in the selected clip or image.



4. Right-click on the effect icon.
5. Click on **Properties** *(or press Ctrl+I)*.
- **Properties** section appears on the left side of the window.
6. Set the values of properties.



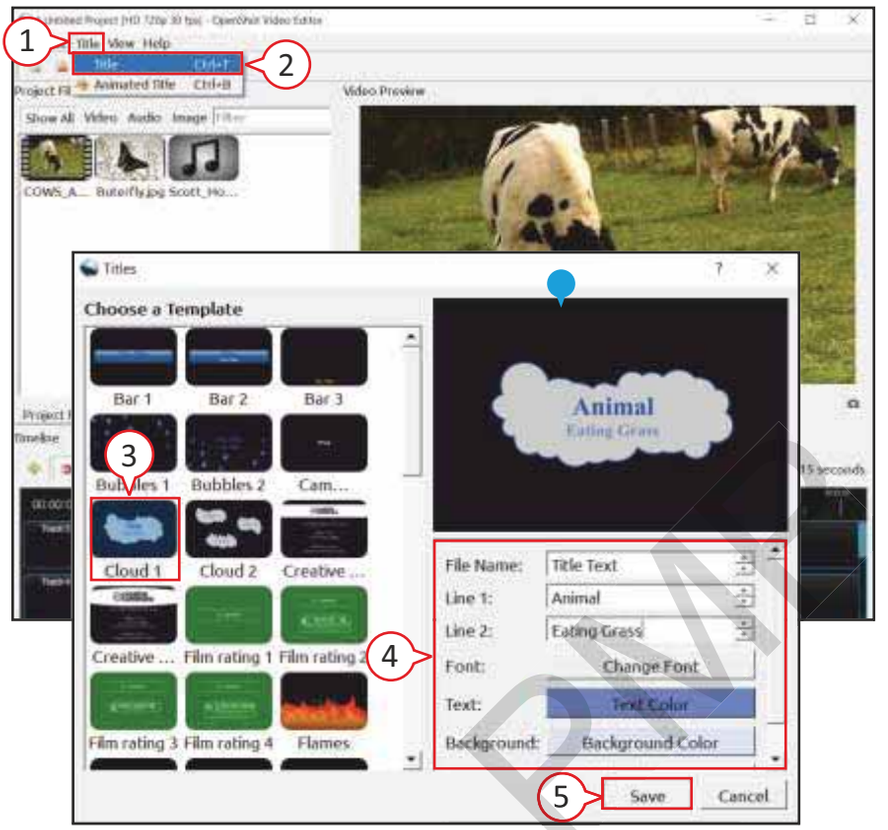
7. Click on **Play** to see a preview of what the effect looks like.
- OpenShot immediately displays a preview of the visual effect.

REMOVING EFFECTS

If you wish to remove an effect, repeat steps **4** and **5** while selecting **Remove Effect** in step **5**. OpenShot removes the visual effect from the clip or image.

Adding Text

OpenShot allows you to add text in your video. Adding text to the video not only improves its viewership but also helps in better explanation or narration. The text plays for the specified amount of time and then disappears; the video clip continues. Steps of adding title, caption and credit are same but title is added in the beginning of the selected clip, captions are added on the selected clip and credits are added at the end of the selected clip.



1. Click on **Title** menu.
2. Click on **Title** *(or press Ctrl+T)*.

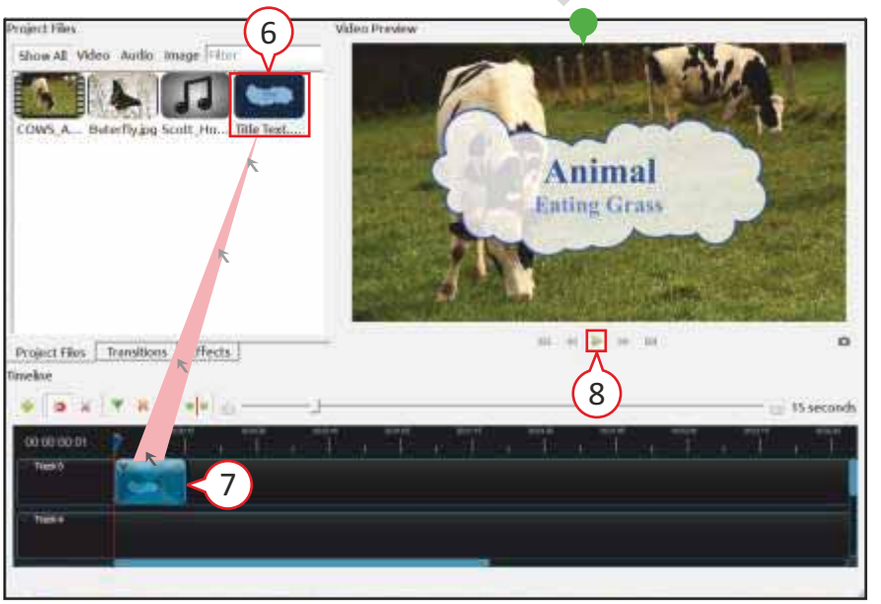
Titles window appears.

3. Click on the template from **Choose a Template** section.
4. Change the text, text color and other attributes from the **Properties** section.

- The **Preview window** will show the changes as they are selected.

5. Click on **Save** button to confirm the changes.

Title text that you saved appears on the Project Files area.



6. Click on **Title Text** file.
7. Drag the text on the timeline and position it on the top of the clip.
8. Click on **Play** button to see a preview of the text.

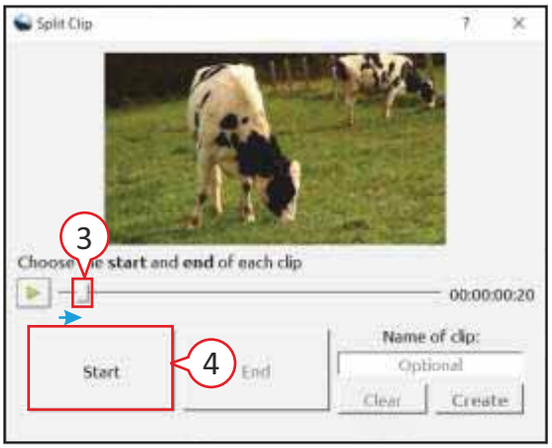
- OpenShot displays a preview of the text in your video.

Editing Media Clips

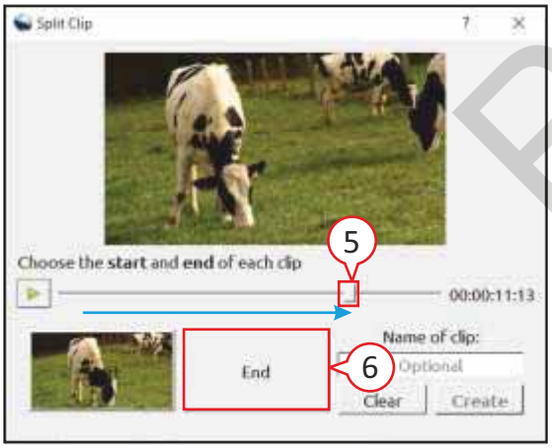
OpenShot allows you to resize or trim your movie clip to remove unwanted sections from your clip.

1. Right-click on any clip on Project Files area that you want to resize.
2. Click on **Split Clip** *(or press Ctrl+X)*.

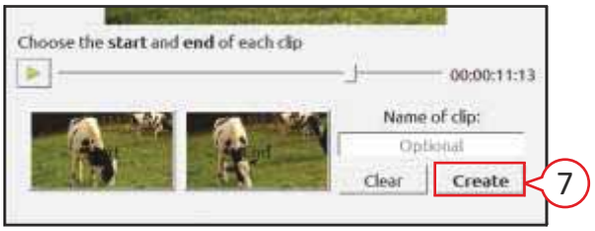
Split Clip box appears.



3. Drag the slider to select the starting point of the clip.
4. Click on **Start** to set the start of the clip.



5. Drag the slider from left to right to select the ending point of the clip.
6. Click on **End** to set the end of the clip.

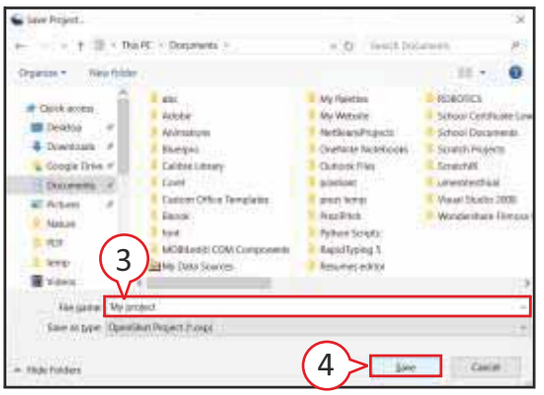


7. Click on **Create** button to resize the clip.

- Resized clip appears in the Project Files area. Now, you can drag it to the Timeline and then click on **Play** button to see the resized clip in the Preview window.

Saving the Project

After you have finished adding and editing your project in OpenShot, you must save it and give it a name. By default, OpenShot saves your file with **.osp** file extension.



1. Click on **File** menu. The File menu appears. *(not shown)*
2. Click on **Save Project** *(or press Ctrl+S). (not shown)*

The **Save Project** dialog box appears.

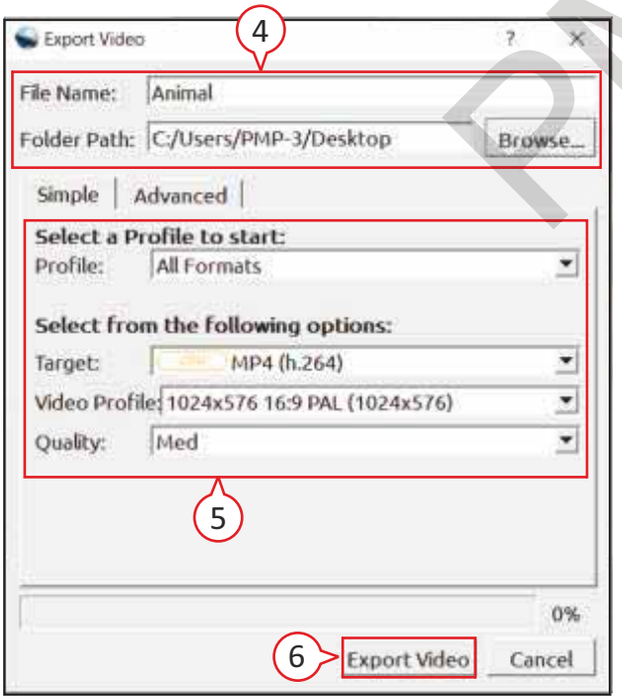
3. Click inside the **File name** text box and type the name for the project.
4. Click on **Save**.

Your project is saved in OpenShot file format.

Exporting the Project

After making and saving your project, you may want to share it. You know that the Openshot project is saved with **.osp** extension.

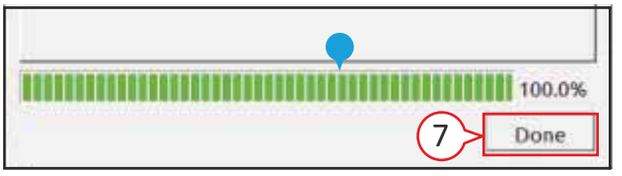
The .osp extension can be opened only in OpenShot. So in order to share your video with someone or upload it to YouTube, Facebook or another website, you will have to save it as a MP4 (h.264) or any other recognized video format.



1. Click on **File** menu. The File menu appears. *(not shown)*
2. Click on **Export Project**. *(not shown)*
3. Click on **Export Video** *(or press Ctrl+E). (not shown)*

The **Export Video** dialog box appears.

4. Give **File Name** and **Folder path** for the project.
5. Choose from one of the many preset export options.
6. Click on **Export Video** to start the export process.



- Progress bar displays the progress of exporting the movie.

7. Click on **Done** after the progress bar shows 100%.

The file gets exported in the desired file format.

Self-Evaluation

After reading the chapter, I know these points:

	CHECKLIST Agree	Disagree
⊙ I know that there are mainly two formats of movies: Real Movie and Animation Movie.	☐	☐
⊙ I know that OpenShot is an open-source video editor software used to combine multiple images, video clips and audio clips into single file and export the combined video into many common video formats.	☐	☐
⊙ I know that transition is a visual effect that appears when our movie plays from one video clip or picture to the next.	☐	☐
⊙ I know that we can add text in OpenShot which plays for the specified amount of time and then disappears.	☐	☐
⊙ I know that the project in OpenShot are saved with .osp extension.	☐	☐

Exercises

A. Tick (✓) the correct answer.

1. ..... movies are made of series of still images is displayed in a quick sequence.
   a. Real ☐ b. Animation ☐ c. Imaginary ☐
2. ..... are used to layer video and images.
   a. Play Heads ☐ b. Tracks ☐ c. Filter boxes ☐
3. A ..... is a visual effect that appears when our movie plays from one video clip or picture to the next.
   a. transition ☐ b. animation ☐ c. timeline ☐
4. ..... transition is used to change the direction of transition effects.
   a. Reverse ☐ b. Change ☐ c. Modify ☐
5. ..... displays the progress of exporting the movie.
   a. Zoom slider ☐ b. Ruler ☐ c. Progress bar ☐

B. Write 'T' for True and 'F' for False statements.

1. OpenShot is only available for Windows OS. ☐
2. Zoom slider is used to adjust the time-scale of our timeline. ☐
3. We cannot add text in OpenShot Video Editor. ☐
4. Split Clip tool is used to remove unwanted section of a movie clip. ☐
5. By default, OpenShot saves our file with .osp file extension. ☐

C. Fill in the blanks.

1. Movies are recorded using ..... and ..... recording equipments.
2. The movie is released on the online platform also called ..... platform.
3. ..... shows the time-scale for our video.
4. We can preview our video looks and sounds in the ..... window.
5. OpenShot allows us to add special ..... effects to our project.

D. Differentiate between the following.

Real Movies	Animated Movies
.....	.....
.....	.....
.....	.....

E. Answer in 1-2 sentences.

1. Name the different mediums to watch movies.

   .....

   .....

2. What is OpenShot?

   .....

   .....

3. What is timeline in OpenShot?

   .....

   .....

F. Answer briefly.

1. Write steps to add audio and video in OpenShot.

   .....

   .....

   .....

2. Write steps to apply transition effects to the clip or image.

   .....

   .....

   .....

G. Application-based Question

Samita wants to make a video containing pictures and video clips of her younger brother on his birthday. She also wants to add his name in the video. Where should she put his name in the clip?

.....

Group Discussion

Divide the students into two groups and discuss – 'Popular Video Editors Software and Their Features'.

Online Link

To learn more about working of OpenShot, visit the website:

https://guides.library.ucsc.edu/DS/Resources/OpenShot

Activity Section

Lab Activity

Create a movie on a poet from your English Literature book and add the following features.

a. Add relevant images in your movie.
b. Insert audio and video wherever applicable.
c. Add title in the beginning of the movie.
d. Apply transition effects.
e. Save the movie as **'My favourite Poet'** in **'Lab Activity'** folder.

Subject Integration

English

This integration will help students find out and know more about the selected poet.

Discover More

Popular Video Editor

Many decades ago, creating cartoons or animated motion pictures was an extremely tedious and time-consuming task because artists were responsible for sketching thousands of the drawings by hand. Nowadays, artists use computers to create these drawings in a fraction of time, which significantly reduces the time and cost of making the movie. Computer technology is also used in video editing and to add visual effects.

Lightworks

Lightworks is a professional non-linear video editing system, available on Linux, Mac, and Windows. Whether you need to make video for social media, YouTube or for 4K film project, Lightworks makes it all possible.

Technology Trailblazers

Bill Gates

? CEO: Microsoft | Microsoft | YEAR: 1975

Bill Gates is an American business magnate and computer programmer. He is the co-founder of **Microsoft**, the world's largest PC software company. Since the company's formation in 1975, Gates has held several positions including those of the chairman, CEO and chief software architect.

Born as the son of a successful lawyer, Bill Gates was encouraged from a young age to be competitive. Bright and curious, he developed an interest in computers while in school. After completing his schooling, he enrolled at the prestigious Harvard College. But he dropped out to pursue his passion in computers and teamed up with **Paul Allen**, a former schoolmate, to establish Microsoft. The company proved out to be highly successful and within years, Gates became an internationally-known entrepreneur.

Worksheet-I

Chapters 1 - 5

A. Tick [✓] the correct answer.

1. ..... is an email protocol for sending email messages across the Internet.
   a. POP3 ☐ b. FTP ☐ c. SMTP ☐
2. ..... is the process of transferring files from computer to a server on the Internet.
   a. Downloading ☐ b. Uploading ☐ c. Browsing ☐
3. A row in a table that contains information is called ..... .
   a. field ☐ b. record ☐ c. datasheet ☐
4. The data type that is used for detailed and descriptive fields is ..... .
   a. Currency ☐ b. Long Text ☐ c. AutoNumber ☐
5. ..... feature allows to quickly search through tables, queries, and forms.
   a. Find ☐ b. Replace ☐ c. Sorting ☐
6. ..... is designed to enter and edit data in a table very easily.
   a. Table ☐ b. Query ☐ c. Form ☐
7. ..... query displays the records that have same values for one or more specified fields.
   a. Simple ☐ b. Unmatched ☐ c. Duplicate ☐
8. ..... is a database object for displaying data from a table in an appealing way.
   a. Report ☐ b. Query ☐ c. Datasheet ☐
9. ..... displays the progress of exporting the movie.
   a. Zoom slider ☐ b. Ruler ☐ c. Progress bar ☐
10. A/an ..... is a visual effect that appears when our movie plays from one video clip or picture to the next.
    a. transition ☐ b. animation ☐ c. timeline ☐

B. Write 'T' for True and 'F' for False statements.

1. A switch is a device that provides a central point for cables in a network. ☐
2. The bus network is also called a linear network. ☐
3. There must be a unique name for each field in the table. ☐
4. The extension of all database files in MS Access is .exe. ☐
5. A relationship works by matching the data in the key field. ☐
6. Find option is used to search a piece of record in tables and forms. ☐
7. Wildcards are conditions that identify the records we want to find. ☐
8. Page header provides the data for creating reports. ☐
9. Zoom slider is used to adjust the time-scale of our timeline. ☐
10. Split Clip tool is used to remove unwanted section of movie clip. ☐

C. Fill in the blanks.

1. ..... cable consists of a single copper wire surrounded by at least three layers.
2. ..... is a set of rules that defines how pages transfer on the Internet.
3. The extension of a database file in Access is ..... .
4. ..... is used to store objects created in another application.
5. Primary key does not allow to enter ..... values.
6. ..... view and ..... view are the two views in which we can create our table.
7. ..... are symbols that represent any character or combination of characters.
8. The lines that are printed for each record are called ..... in Report.
9. OpenShot allows us to add special ..... effect to our project.
10. The movie is released on the online platform also called ..... platform.

D. Define the following.

1. FTP
2. Datasheet View
3. Major key
4. Validation rule
5. Preview window
6. Tracks

E. Differentiate between the following.

1. LAN and WAN
2. Peer-to-Peer and Client Server Network
3. Record and Field
4. Sorting and Filtering
5. Asterisk (*) wildcard and Question mark (?) wildcard
6. Real movie and Animated movie

F. Answer the following questions.

1. What do you understand by dedicated servers? Give examples.
2. What do you mean by wireless transmission media?
3. What is the role of tables in database?
4. What is the use of Find and Replace feature in MS-Access?
5. What do you mean by compound criteria?
6. Why do we need a primary key?
7. What do you mean by Relationship window?
8. Explain the Query Window options.
9. Name the different medium to watch movies.
10. Write steps to add audio and video in OpenShot.

6 E-Commerce and Blogging

OBJECTIVES

After completing this chapter, you will be able to:

- Understand e-commerce and its advantages.
- Learn about four basic models of e-commerce.
- Understand e-retailing and process of making online purchase.
- Identify top e-commerce websites.
- Understand the concept of blogging.

E-Commerce

Electronic commerce (e-commerce), also known as **e-business**, is a financial business transaction that occurs over an electronic network.

Anyone who has a computer connected to the Internet and has the means to make an online payment (through credit card, debit card, net banking, etc.) for goods or services purchased online can participate in e-commerce. Two popular types of e-commerce are **shopping** and **trading in stocks**.

There are hundreds of websites devoted to online shopping. Some websites focus on one product or service, such as books or travel, whereas other sites offer a wide range of products and services. The web is a great place to sell your goods and services. E-commerce eliminates the barrier of time and distance that slows down traditional business transactions. E-commerce transactions occur quickly and globally, and a lot of time is saved.

Initially, e-commerce transactions were conducted primarily through desktop computers. Today, many hand-held computers and smartphones can access the web wirelessly. The e-commerce that takes place using mobile devices is called **m-commerce** (short for **mobile commerce**).

ADVANTAGES OF E-COMMERCE

E-commerce is a part of the web which enables online buying and selling of goods and services. Its advantages are given below.

For Buyers

- They have the convenience of shopping at home.
- They can compare the price of items easily.
- They can read reviews of other users before buying the products.
- It enables doorstep delivery of the desired goods and services.
- They can also give instant feedback and even initiate return process.

For Sellers

- The web offers low overhead expenses.
- Free or low-cost marketing activities.
- Potential buyers can be millions of people.

E-Commerce Business Models

The four basic models of e-commerce business are **Business-to-Consumer**, **Consumer-to-Consumer**, **Business-to-Business**, and **Business-to-Employee**.

BUSINESS-TO-CONSUMER E-COMMERCE

Business-to-Consumer (B-to-C or **B2C)** e-commerce consists of the sale of products or services from business concern to the general public or end users. In this model, the seller is the business concern, and the buyer is the consumer (public). Products for sale can be physical objects, such as books, flowers, computers, groceries, medicines, automobiles, etc. With B2C business model, the sellers can sell products directly to consumers, without using traditional retail channels. This enables companies to sell products at a lower cost with quick service.

CONSUMER-TO-CONSUMER E-COMMERCE

In **Consumer-to-Consumer (C-to-C** or **C2C)** e-commerce, the individuals use the Internet to sell products and services directly to other individuals. **Online auction** is the most popular mode for C2C e-commerce. In this, one consumer auctions goods to other consumers. If you are interested, you place a bid on an item. The highest bidder, as in any other auction, buys the item. OLX is an example of C2C e-commerce.

BUSINESS-TO-BUSINESS E-COMMERCE

In a **Business-to-Business (B-to-B** or **B2B)** e-commerce, the sale or exchange of products and services takes place between firms or companies. For example, a company that manufactures cars uses the Internet to purchase tyres from their supplier or manufacturer.

BUSINESS-TO-EMPLOYEE E-COMMERCE

Business-to-Employee (B-to-E or **B2E)** e-commerce, also known as **intra business e-commerce**, refers to the use of Intranet technology to handle activities that take place within a business.

Unlike the previously discussed types of e-commerce business models, B2E e-commerce does not generate revenue. Instead, it increases profits by reducing expenses within a company. For example, using B2E e-commerce, employees collaborate with each other, exchange data and information, and access the in-house databases, sales information, and market news.

E-Retailing

Once you have researched about the product, read the reviews and found the best price, you are ready to purchase the product. **E-retail** occurs when retailers use the web to sell their products and services.

MAKING AN ONLINE PURCHASE

A customer (consumer) visits an online business portal at the **electronic storefront**. An electronic storefront, also called an **online catalog**, is the website where an e-retailer displays the products. It contains descriptions, pictures, and product reviews.

After going through the information, the customer makes a selection. This activates the second area of the store known as the **shopping cart**. The shopping cart allows the customer to collect the items for purchase. Items in the shopping cart can be added, deleted, or even saved for a future order.

When the item is ready for the purchase, the customer proceeds to the **checkout**. At this time, the customer enters his/her personal and financial information through a **secure web connection**. The transaction and the financial data are automatically verified at a banking website. If the bank approves the transaction, the customer receives a confirmation of the purchase. Then, the e-retailer processes the order and sends it to the fulfillment center, where it is packaged and shipped to the customer. Shipping information is posted on the website and e-mailed to the customer, so that the customer can track the order. The order may take a few days, after the purchase, to reach the customer.

When you are purchasing online, make sure that you have entered all the required information correctly. Typically, you need to type your full address, including the ZIP or postal code, your phone number, and your credit/debit card number, its expiry date and the security code. Many retailers require you to open an account on their website. Therefore, before making a purchase from such a website, you should set up an account and then log into the website.

These days, many online companies are providing the facility of **Cash On Delivery** or **COD**. It means you can pay through cash for the goods you have purchased only after the goods are delivered to you. There is also a **return policy**; if you do not like the product, you can return it within the stipulated time.

Path of an Authorized E-Retail Transaction

Shopping Cart

While shopping online, you usually add the items that you want to purchase to a **virtual shopping cart** that keeps track of these items and their quantity. Most websites have a **view cart link** that enables you to view the items of your shopping cart. The cart usually has a link of **Proceed to Checkout** that takes you to that page where you will provide the information about your address and payment.

Research Before You Purchase Online

Whether you are looking for a laptop or a video camera or any other product, you should research for the information about it on the Internet before purchasing. On the web, you will find reviews of the products which are quite useful. The web has plenty of places that offer in-depth, unbiased reviews by professionals who really put products to the test and tell you the advantages and the disadvantages of using them.

Security Concern

Shopping online nowadays is very secure and reliable. When you purchase goods or services online, the vendor wants you to provide accurate payment information by typing your credit or debit card number, its expiry date and the security code, along with your name and address details correctly. It is vital that this sensitive data does not fall into the wrong hands. Therefore, you need to ensure that you provide the payment information only to a secure site.

The website and your web browser display various indicators to ensure that you are entering your confidential data on a secure site. On the website, look for "**https**" instead of "**http**" in the site address, and also look for a security icon, such as "**VeriSign Secured**". In the web browser, look for a **lock icon** in the browser window. In some browsers, the address bar shows a **green background** for a secure site.

MODES OF PAYMENT

Mode of payment is a way that a buyer chooses to pay the seller for a good or service that is also acceptable to the seller. E-commerce sites use **e-money** to do electronic payment. **Electronic payment** refers to paperless monetary transactions. There are various ways of making electronic payments through electronic modes such as credit card, debit card, electronic wallet, and netbanking.

Credit Card

A **credit card** is a plastic card issued by a bank that allows you to borrow pre-approved fund in order to complete the purchase. Credit card is most widely used for making online payments. Many e-commerce sites allow you to store your credit card detail securely so that you do not need to type in the card details each time. You only need to enter the CVN (Card Verification Number) or CVV (Card Verification Value) which is printed at the back of the card.

Debit Card

A **debit card**, also known as **bank card,** is also a plastic card issued by a bank that allows you to complete the purchase. It looks and works in the same way as the credit card. The only difference is that when you use debit card for any transaction, the money for that transaction deducts directly out of your bank account.

Electronic Wallets (e-wallet)

E-wallet, also called **digital wallet**, allows you to store your credit card and bank account numbers in a secure environment, and eliminates the need to enter account information while making your payment. Once you have registered and created e-wallet profile, you can make online payments faster and with less typing.

NetBanking

NetBanking is a system of banking in which a customer performs transactions electronically without visiting the bank personally. When you choose netbanking option for a transaction in e-commerce, it redirects to your bank's website, where you need to sign in by entering the user ID and password. The amount for transaction is deducted directly from your bank account.

Top E-Commerce Websites

AMAZON.COM

Amazon was founded by **Jeff Bezos** in late 1994. In the beginning, Amazon.com sold books but today, it is a vast Internet-based electronic commerce site that sells books, music, movies, housewares, electronics, toys, and many other goods, either directly or as a direct link between other retailers and the customers.

FLIPKART.COM

Flipkart Pvt Ltd. is an Indian electronic commerce company based in Bengaluru, India. Founded by **Sachin Bansal** and **Binny Bansal** in 2007, the company initially focused on book sales before expanding into other product categories such as consumer electronics and lifestyle products.

SNAPDEAL.COM

Snapdeal is an online marketplace based in New Delhi, India. The company was started by **Kunal Bahl** and **Rohit Bansal** in February 2010. Snapdeal has grown to become one of the largest online marketplaces in India offering an assortment of 4 million+ products, shipping to more than 4,000 towns and cities in India.

ALIBABA.COM

Alibaba Group was established in 1999 initially by 18 people led by **Jack Ma**, a former English teacher from Hangzhou, China. Today, Alibaba.com is the leading platform for global wholesale trade. It serves millions of buyers and suppliers around the world. It sells millions of products in over 40 different categories, including consumer electronics, machinery and apparel.

Blogging

Blogging is a modern and dynamic medium by which you can publish your ideas, opinions, and stories online. It is a place to express yourself to the world; a place to share your thoughts and your passion.

A **blog** is a website that consists of a frequently updated collection of information and entries. Most blogs focus on a particular topic or subject area, although in a majority of blogs the **'subject'** is the person writing the blog. The entries that appear on a blog are called **posts**, and the act of publishing a blog is called **posting**. A single person who owns and maintains many blogs is known as a **blogger**.

The term **blogosphere** refers to the worldwide collection of blogs. There are over 100 million blogs on the web.

A blog that contains video is sometimes called a **video blog** or **vlog**.

A **microblog** allows users to publish short messages, usually between 100 and 200 characters, for others to read.

Some of the famous blog hosting services are Blogger (www.blogger.com), TypePad (www.typepad.com), and wix (www.wix.com).

USES OF BLOG

Similar to an editorial section in a newspaper, blogs reflect the interests, opinions, and personality of the blogger, and sometimes website visitors. Blogs have become an important means of worldwide communication.

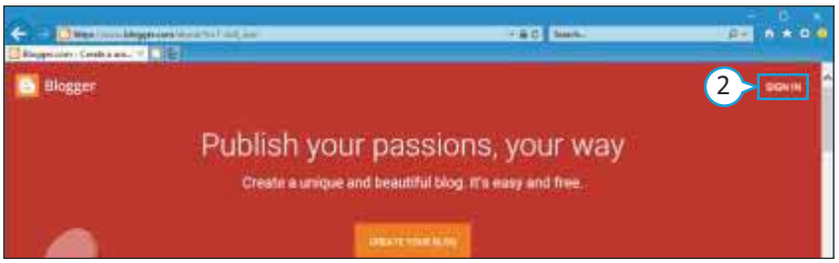
Businesses create blogs to communicate with employees, customers, and vendors. They may post announcements or new information on a corporate blog.

Teachers create blogs to collaborate with other teachers, management and students.

Home users create blogs to share aspects of their personal lives with family and friends.

CREATING A BLOG

In this example, for creating a blog, we are using **Blogger**. The Blogger is a product of **Google**.



1. Open www.blogger.com site.
2. Click on **SIGN IN**.

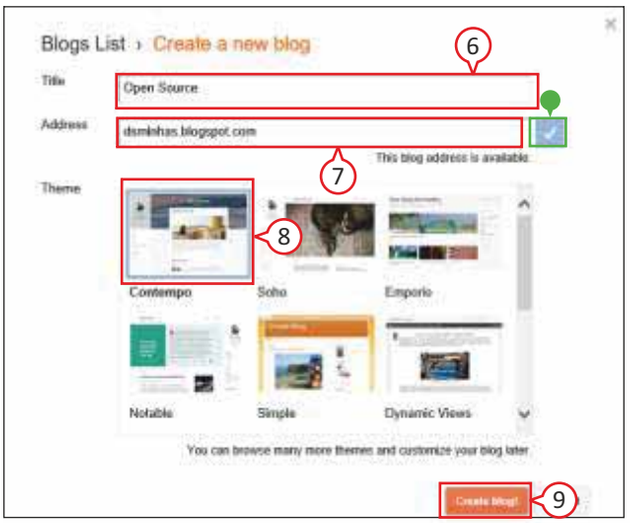
Google Sign In page appears.

3. Type your **login ID** and the **password.** ***Password*** *will appear in the form of black dots.* (not shown)

Your login ID and password are same as that of your Gmail account.

4. Click on **Next** button. (not shown)

5. Click on **CREATE NEW BLOG**.



Create a new blog window appears.

6. Type the name for your blog, which will appear at the top of each page.
7. Type the **Address** you want to use.

This address uses the form http://youraddress.blogspot.com, where 'youraddress' is the address you typed.

- **Check Availability** will ensure the address is available.

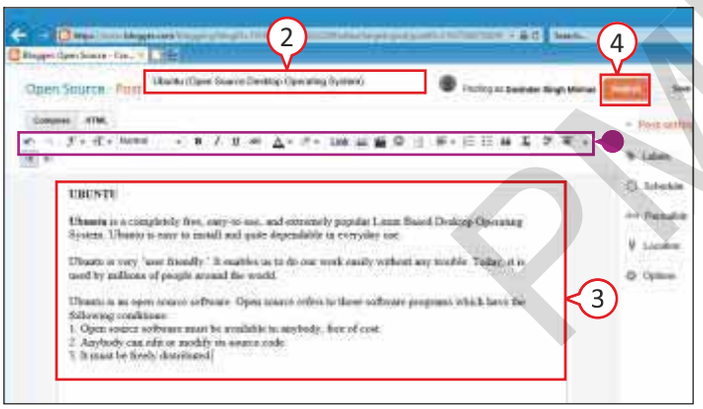
8. Click on the theme you want in the blog.
9. Click on **Create blog!**.

Blogger creates your blog. Now, you can add your post in it.

POSTING ON YOUR BLOG

1. Click on **New post**.

The new window appears.



2. In the **Title text box**, type a post title.
3. In the **large text box**, type the body of the post.

- You can format the text by using these icons on the Toolbar.

4. When you are done, click on **Publish**.

Blogger will publish your post.

VIEWING YOUR POST

1. Select your post by clicking on the **checkmark** option.
2. Click on **View**.

You can view your post.

From outside the Blogger site, use web browser to navigate to your BlogSpot address: http://youraddress.blogspot.com, where 'youraddress' is the address you specified when you created the blog.

Self-Evaluation

After reading the chapter, I know these points:

	CHECKLIST	
	Agree	Disagree
⊙ I know that e-commerce is a financial business transaction that occurs over an electronic network.	☐	☐
⊙ I know that there are four basic models of e-commerce business: Business-to-Consumer, Consumer-to-Consumer, Business-to-Business, and Business-to-Employee.	☐	☐
⊙ I know that mode of payment is a way that a buyer chooses to pay the seller for a good or service that is also acceptable to the seller.	☐	☐
⊙ I know that Amazon, Flipkart, Snapdeal and Alibaba are the top e-commerce websites.	☐	☐
⊙ I know that blogging is an exciting and dynamic medium by which we can publish our ideas, opinions, and stories online.	☐	☐

Exercises

A. Tick (✓) the correct answer.

1. ..... is an e-commerce model used by individuals to sell products and services directly to other individuals.
   a. B2C ☐ b. B2E ☐ c. C2C ☐
2. An electronic storefront, also called an ..... .
   a. Online Catalog ☐ b. Online Auction ☐ c. Shopping Cart ☐
3. We should enter our personal and financial information through a ..... connection.
   a. secure web ☐ b. insecure web ☐ c. common web ☐
4. ..... is an Indian e-commerce company based in Bengaluru, India.
   a. Snapdeal ☐ b. Flipkart ☐ c. Amazon ☐
5. A blog is a ..... having frequently updated collection of information and entries.
   a. software ☐ b. website ☐ c. app ☐

B. Write 'T' for True and 'F' for False statements.

1. Customers can compare the price of items easily in online shopping. ☐
2. Before purchasing online, there is no need of doing research about that product. ☐
3. A secure website has 'https' instead of 'http' in web address. ☐
4. Snapdeal has become one of the largest online marketplaces in India. ☐
5. The blog that contains video is sometimes called video blog or vlog. ☐

C. Fill in the blanks.

1. The e-commerce that takes place using mobile device is called ..... .
2. Online auction is the most popular mode for ..... e-commerce model.
3. The ..... allows the customer to collect the items for purchase.
4. In the web browser, look for a ..... icon for security concern.
5. The term ..... refers to the worldwide collection of blogs.

D. Define the following.

1. E-wallet: .....

.....

2. Net Banking: .....

.....

E. Differentiate between the following.

B2B	B2C
.....	.....
.....	.....
.....	.....

F. Answer in 1-2 sentences.

1. What do you mean by e-commerce?

.....

.....

2. What is e-retailing?

.....

.....

3. What do you mean by blogging?

.....

.....

G. Answer briefly.

1. What are the advantages of e-commerce?

.....

.....

.....

2. What are the security concerns one should consider while using e-commerce?

.....

.....

.....

3. What is a blog? Write down its uses.

.....

.....

.....

H. Application-based Question

Riya needs to buy some books from a retail website. She wants to pay for the books only after the books are delivered. By which facility can she pay for the books that she wants to purchase online?

.....

Group Discussion

Divide the students into two groups and discuss the topic – 'The Precautions One Should Take While Doing Online Shopping to Avoid Online Fraud'.

Online Link

To learn more about working of e-commerce, visit the website:

https://www.shopify.com/encyclopedia/what-is-ecommerce

Activity Section

Lab Activity

With the help of the Internet, search information on 'Conservation of Plants and Animals'. Save the information, create a blog and post it.

Subject Integration

Science

This integration will help students search about and know the importance of conserving plants and animals.

SUSTAINABLE DEVELOPMENT GOALS

15 LIFE ON LAND

Activity Quiz

Haqe and Akash are playing a quiz on online services. Help Haqe answer all the questions correctly.

Akash: Hi Haqe! Do you know anything about online services?

Haqe: Yes Akash. Our teacher told us about different types of online services like e-commerce and blogging.

Akash: Great! Then let us play a quiz. I will give you clues and you have to tell me the correct answers.

Haqe: It will be fun! Let us start the quiz quickly.

Akash: 'It enables online buying and selling of goods and services.'

Haqe: It is called ..... .

Akash: Now, the second one– 'It is an e-commerce model where the individuals use the Internet to sell products and services directly to other individuals.'

Haqe: It is a ..... .

Akash: Wonderful! Next question for you– 'While shopping online, you usually add the items that you want to purchase in it, to keep track of them.'

Haqe: It is called a ..... .

Akash: Now answer this– 'It is a plastic card issued by the bank that allows you to borrow pre-approved fund in order to complete the purchase.'

Haqe: It is called a ..... .

Akash: Now answer this– 'He is a single person who owns and maintains many blogs.'

Haqe: He is known as a ..... .

Akash: Now the last one– 'This e-commerce site was initially established by 18 people led by Jack Ma.'

Haqe: It is ..... .

Activity Write

Write the steps for an authorized e-retail transaction.

Step 1

.....

.....

Step 2

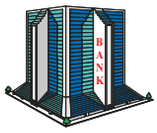
.....

.....

Step 3

.....

.....



Step 4

.....

.....

Step 5

.....

.....

Step 6

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.....

Step 7

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Step 8

.....

.....

Technology Trailblazers

Jeffrey Preston Bezos

Founder: Amazon | **YEAR: 1994**

Jeffrey Preston Bezos is an American technology entrepreneur, investor, and philanthropist who is best known as the founder, chairman, and chief executive officer of **Amazon**, the world's largest online shopping retailer.

As a child, he spent his days laying pipes, vaccinating cattle and fixing windmills at his grandfather's Texas ranch. He attended Miami Palmetto Senior High School and took his B.Sc. degree in Electrical Engineering and Computer Science from Princeton University. He worked on Wall Street and became the youngest Vice President at D. E. Shaw & Co. Despite success, he decided to quit the field of finance. He founded **Amazon.com**, an online shopping store. He has constantly been improving his website and introducing improved facilities for his customers.

7 HTML 5 – Form, Multimedia and CSS

OBJECTIVES

After completing this chapter, you will be able to:

- Understand input control and its types.
- Learn to create and add forms on web page.
- Add multimedia on web page.
- Understand the role of CSS and its types.

In your previous class, you have learnt about creating, formatting, linking and adding images and tables in web page using HTML5 language. In this chapter, you will move ahead and learn more about HTML5 like adding forms, multimedia and CSS to web pages.

HTML

HTML (Hyper Text Markup Language) is a language in which you can make web pages on the Internet and view them using a web browser. HTML documents are made up of text content and special codes known as **tags** that tell web browsers how to display the content.

INPUT CONTROL

An **input control** is a type of input mechanism on a form. A form may contain several different types of input controls classified as **data** or **text** input controls.

A **data input control** can be a Radio button (Radio), a Check box (Checkbox), a Submit button (Submit), a Reset button (Reset), and/or a Selection menu (Select).

A **text input control** allows the user to enter text through the following:

1. a **text box** (text), for small amount of text.
2. a **textarea** box (textarea), for large amount of text.
3. a **password** text box (password), for entering a password.

A **text control** creates a text box that is used for a single line of input. The text control has two attributes:

1. **Size**, which determines the number of characters that are displayed on the form.
2. **Maxlength**, which specifies the maximum length of the input field.

A **password control** also creates a text box used for a single line of input, except that the characters entered into the field can appear as asterisks or bullets. A password text box holds the password entered by a visitor.

A **radio control** limits the web page visitor to only one choice from a list of choices. Each choice is preceded by a radio or option button, which typically appears as a circle.

A **checkbox control** allows a web page visitor to select more than one choice from a list of choices. Each choice in a checkbox list can be either on or off. By default, all checkboxes are deselected.

A **select control** creates a selection menu from which the visitor selects one or more choices. This prevents the visitor from having to type information into a text or textarea field.

A **textarea control** creates a field that allows multiple lines of input. Textarea fields are useful when detailed input is required from or desired by a web page visitor.

The **Submit button** sends the information to the appropriate location for processing. A web page form must include a Submit button.

The **Reset button** clears any input that was entered in the form, resetting the input controls back to the default. A web page form must also include a Reset button.

Creating Forms

You can use forms to collect information from the people who visit your website. A **form** has input fields for users to enter information and limits choices to valid options to avoid incorrect data entry. Forms provide an easy way to collect required information.

Web page forms have three important parts: a **<FORM> tag**, **form input elements**, and a **Submit button**. While designing and building a form, you write HTML to define the different objects that allow users to type or select information. These objects can include text fields, radio buttons, check boxes and other options. All forms should include a Submit button for sending the data to a web server for processing.

SETTING UP A FORM

You must set up a form before you can add information to it. To set up a form, we need to specify two important information, i.e. **METHOD** and **ACTION** property of **<FORM>** tag.

METHOD property tells the form how to transfer the data to the form processor, which is your **CGI script** or your **e-mail address**. We can assign either of the two values to the METHOD property, which are:

a. **GET** – If the METHOD property of FORM is set to GET, then the data in the form is given to the form processor in the form of an environment variable (QUERY_STRING). If no METHOD property is given in <FORM> tag, the default property is set to GET.

b. **POST** – If the METHOD property of FORM is set to POST, then the data in the form is given to the form processor as the standard input to the program.

ACTION property of the <FORM> tag tells what action the form should take when the user presses the SUBMIT button.

Note: *If you would like to receive the e-mail without an attachment in a text form, then in the <FORM> tag, type* ***ENCTYPE = "TEXT/PLAIN"****.*

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE> Creating Text Box </TITLE>
</HEAD>
<BODY>
<FORM METHOD="POST" ACTION = "mailto:
minhasds@gmail.com" ENCTYPE="TEXT/PLAIN">
</FORM>
</BODY>
</HTML>
```

1. Type **<FORM METHOD = "POST"** where you want the form to appear on your web page. Then press **SPACEBAR** key.
2. Type **ACTION = "?">**, replacing **?** with the location of your CGI script on your web server that will process the information submitted by your form.
   Or
   If you like to get the information to your e-mail address, type **ACTION = "mailto: ?">**, replacing **?** with your e-mail address.

- If you want to receive the information as text in your e-mail, type **ENCTYPE = "TEXT/PLAIN"** in the <FORM> tag.

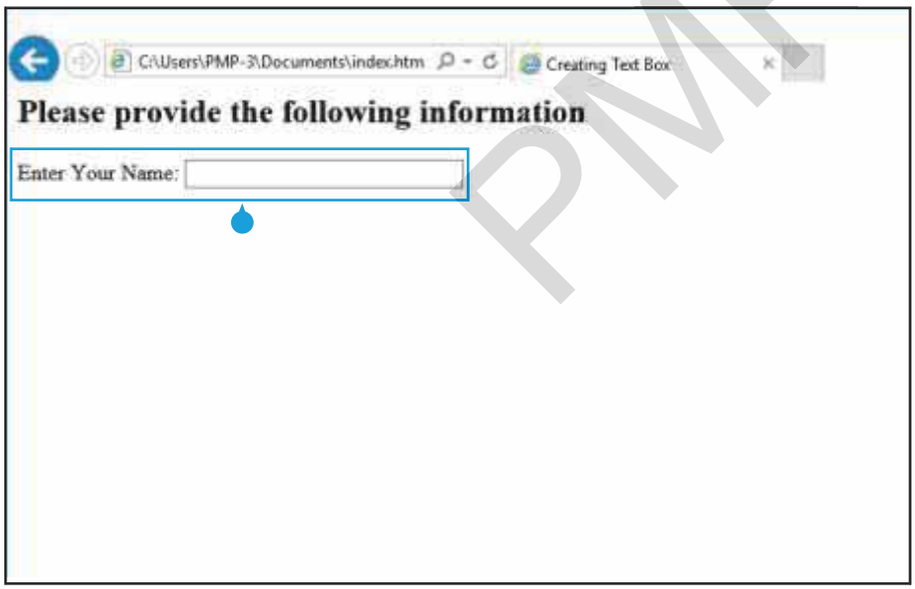
3. Type **</FORM>** to complete the form.

CREATING A TEXT BOX

You can create a text box that allows readers to enter a line of text. Text boxes are normally used for entering names and addresses.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE> Creating Text Box </TITLE>
</HEAD>
<BODY>
<H2>Please provide the following information</H2>
<FORM METHOD="POST" ACTION="mailto:minhasds@gmail.com">
<P>Enter Your Name: <INPUT TYPE="text" Name="urname"
SIZE="30" MAXLENGTH="20">
</FORM>
</BODY>
</HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type the text you want to appear beside the text box. Then press **SPACEBAR** key.
2. Type **<INPUT TYPE = "text"**, and then press **SPACEBAR** key.
3. Type **NAME = "?"**, replacing **?** with a word that describes the text box. Then press **SPACEBAR** key.
4. To define the width of the text box, type **SIZE ="?"**, replacing **?** with the width you want to use for the text box.
5. If you want to define the maximum number of characters that visitor can enter in a text box, type **MAXLENGTH = "?"**, replacing **?** with the maximum number of characters.
6. Type **>** to complete the text box.



- *The web browser displays the text box.*

Adding a Default Value to a Text Box

A **default text value** appears in the text box when the user views the form. You can use default values to display instructions about the type of data required, give users an example of the data you are looking for, or show a popular choice or response. To specify a default, you can add the VALUE attribute to the <INPUT> tag.

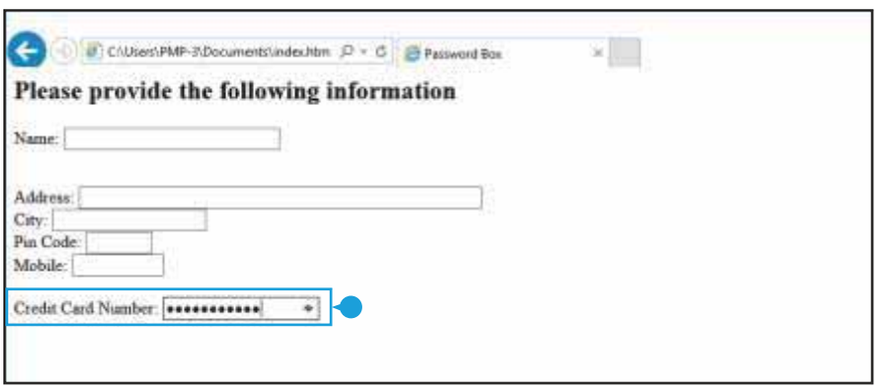
For example: **<INPUT TYPE="text" NAME="email" VALUE="Enter your e-mail address">**

CREATING A PASSWORD BOX

You can create a password box that allows readers to enter confidential or secret information, such as credit card number or password. It differs from standard text box in a manner that when a user types in any character, an **asterisk** (*) or a **bullet** (•) appears for each character typed on screen. So, it prevents others from reading the information.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE> Password Box </TITLE>
</HEAD>
<BODY>
<H2>Please provide the following information</H2>
<FORM METHOD="POST"
ACTION="mailto:minhasds@gmail.com">
<P>Name: <INPUT TYPE="text" NAME="urname" SIZE="30"
MAXLENGTH="20"></P>
<BR>
Address: <INPUT TYPE="text" NAME="address" SIZE="60"
MAXLENGTH="50">
<BR>
City: <INPUT TYPE="text" NAME="city" SIZE="20"
MAXLENGTH="20">
<BR>
Pin Code: <INPUT TYPE="text" NAME="Pincode" SIZE="6"
MAXLENGTH="6">
<BR>
Mobile: <INPUT TYPE="text" NAME="mobile" SIZE="10"
MAXLENGTH="10">
<BR>
<BR>
Credit Card Number: <INPUT TYPE="password" NAME="credit"
SIZE="20" MAXLENGTH="15">
</FORM>
</BODY>
</HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type the text you want to appear beside the password box. Then press **SPACEBAR** key.
2. Type **<INPUT TYPE = "password"** and then press **SPACEBAR** key.
3. Type **NAME = "?"**, replacing **?** with a word that describes the password box. Then press **SPACEBAR** key.
4. To define the width of the password box, type **SIZE = "?"**, replacing **?** with the width you want the characters to have.
5. If you want to define the maximum number of characters that a visitor can enter in a password box, type **MAXLENGTH = "?"**, replacing **?** with the maximum number of characters.
6. Type **>** to complete the text box.



- ***The web browser displays the password box.***

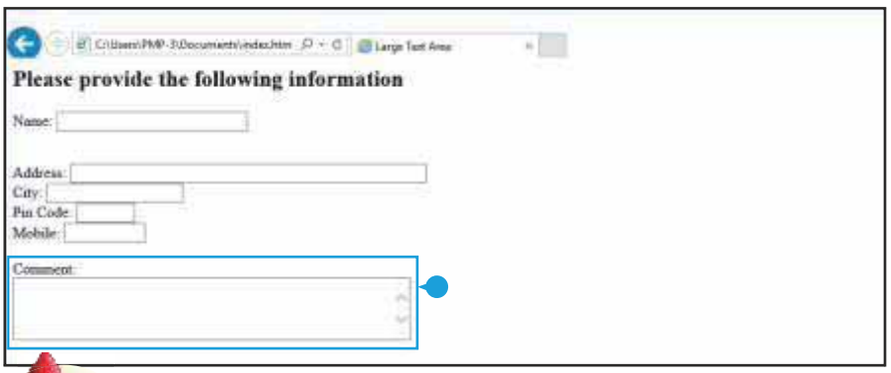
When a user types characters in the password box, a bullet (•) or an asterisk (*) appears for each character in the password box on screen.

CREATING A LARGE TEXT AREA

You can create a large text area that allows visitors to enter several lines of text. A large text area is ideally used for getting comments or feedback from the visitors.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE> Large Text Area </TITLE>
</HEAD>
<BODY>
<H2>Please provide the following information</H2>
<FORM METHOD="POST"
ACTION="mailto:minhasds@gmail.com">
<P>Name: <INPUT TYPE="text" NAME="urname" SIZE="30"
MAXLENGTH="20"></P>
<BR>
Address: <INPUT TYPE="text" NAME="address" SIZE="60"
MAXLENGTH="50">
<BR>
City: <INPUT TYPE="text" NAME="city" SIZE="20"
MAXLENGTH="20">
<BR>
Pin Code: <INPUT TYPE="text" NAME="Pincode" SIZE="6"
MAXLENGTH="6">
<BR>
Mobile: <INPUT TYPE="text" NAME="mobile" SIZE="10"
MAXLENGTH="10">
<BR><BR>
Comment:
<BR>
<TEXTAREA NAME="comments" ROWS="4" COLS="50" WRAP>
</TEXTAREA>
</FORM>
</BODY> </HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type the text you want to appear beside or above the text area. Then press the **SPACEBAR** key.
2. Type **<TEXTAREA** and then press the **SPACEBAR** key.
3. Type **NAME = "?"**, replacing **?** with a word that describes the text area. Then press the **SPACEBAR** key.
4. Type **ROWS ="?"**, replacing **?** with the height for the text area. Then press the **SPACEBAR** key.
5. Type **COLS ="?"**, replacing **?** with the width for the text area. Then press the **SPACEBAR** key.
6. Type **WRAP>** if you want to have the text that visitor types automatically wrapped within the text area.
7. Type **</TEXTAREA>** to complete the text area and skip step 4 if you do not want other checkbox to be selected.



- ***The web browser displays the text area.***

Another Way to Keep Users from Typing Text into a Large Text Area

If you want to display default text in a text area and do not want users to move or edit the text, you can use the **READONLY attribute**. For example, you might use a large text area to explain something about your form or offer detailed instructions. You can place the **READONLY attribute** without assigning it a value within the **<TEXTAREA>** tag.

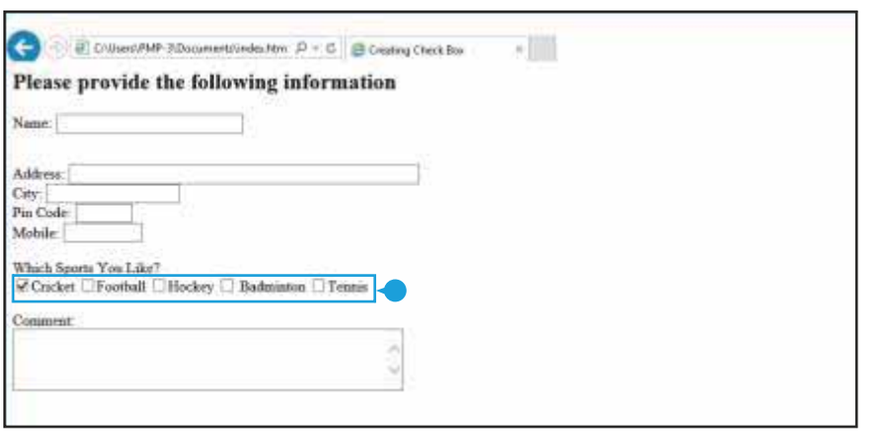
CREATING CHECKBOXES

You can include checkboxes in a form if you want visitors to select one or more options. While creating checkboxes, you need to specify the following information:

- You need to specify a word that describes the group of checkboxes. This is done using the **NAME attribute**.
- You need to specify a word that describes each checkbox. This is done using the **VALUE attribute**.
- You need to specify the text you want to appear beside each checkbox on your web page.

```
<P>Name: <INPUT TYPE="text" NAME="urname" SIZE="30"
MAXLENGTH="20"></P>
<BR>Address: <INPUT TYPE="text" NAME="address" SIZE="60"
MAXLENGTH="50">
<BR>City: <INPUT TYPE="text" NAME="city" SIZE="20"
MAXLENGTH="20">
<BR>Pin Code: <INPUT TYPE="text" NAME="Pincode" SIZE="6"
MAXLENGTH="6">
<BR>Mobile: <INPUT TYPE="text" NAME="mobile" SIZE="10"
MAXLENGTH="10">
<BR><BR>
Which Sports You Like?
<BR><INPUT TYPE="checkbox" NAME="sports" VALUE="Cricket"
CHECKED>Cricket
<INPUT TYPE="checkbox" NAME="sports"
VALUE="Football">Football
<INPUT TYPE="checkbox" NAME="sports"
VALUE="Hockey">Hockey
<INPUT TYPE="checkbox" NAME="sports" VALUE="Badminton">
Badminton
<INPUT TYPE="checkbox" NAME="sports"
VALUE="Tennis">Tennis
<BR><BR>
Comment:
<BR>
<TEXTAREA NAME="comments" ROWS="4" COLS="50" WRAP>
</TEXTAREA>
</FORM>
</BODY> </HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type **<INPUT TYPE = "checkbox"** and then press the **SPACEBAR** key.
2. Type **NAME = "?"**, replacing **?** with a word that describes the group of checkboxes you want to create. Then press the **SPACEBAR** key.
3. To specify the information for one checkbox, type **VALUE = "?"**, replacing **?** with a word that describes the checkbox.
4. If you want the checkbox to be selected automatically, press the **SPACEBAR** key and then type **CHECKED**.
5. Type **>** to complete the checkbox.
6. Type the text you want to appear beside the checkbox on your web page.
7. Repeat steps **1** to **6** for each checkbox you want to create and skip step **4** if you do not want other checkboxes to be selected.



- **The web browser displays the checkboxes.**

CREATING RADIO BUTTONS

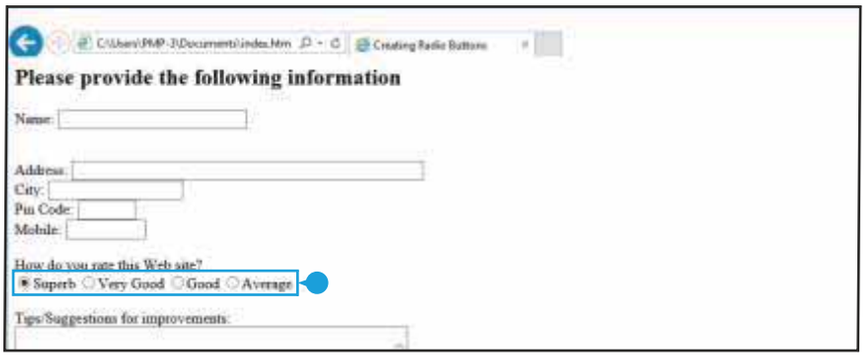
You can include radio buttons in a form if you want visitors to select only one of the several options. While creating radio buttons, you need to specify the following information:

- You need to specify a word that describes the group of radio buttons by using the **NAME attribute**.
- You need to specify a word that describes each radio button. This is done using the **VALUE attribute**.
- You need to specify the text you want to appear beside each radio button on your web page.

```
<BR>City: <INPUT TYPE="text" NAME="city" SIZE="20"
MAXLENGTH="20">
<BR>Pin Code: <INPUT TYPE="text" NAME="Pincode"
SIZE="6" MAXLENGTH="6">
<BR>Mobile: <INPUT TYPE="text" NAME="mobile"
SIZE="10" MAXLENGTH="10">
<BR><BR>
How do you rate this Web site?
<BR><INPUT TYPE="radio" NAME="rate" VALUE="Superb"
CHECKED>Superb
<INPUT TYPE="radio" NAME="rate" VALUE="Very
Good">Very Good
<INPUT TYPE="radio" NAME="rate" VALUE="Good">Good
<INPUT TYPE="radio" NAME="rate"
VALUE="Average">Average
<BR><BR>
Tips/Suggestions for improvements:
<BR>
<TEXTAREA NAME="comments" ROWS="4" COLS="50"
WRAP>
</TEXTAREA>
</FORM>
</BODY> </HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type **<INPUT TYPE = "radio"** and then press the **SPACEBAR** key.
2. Type **NAME = "?"**, replacing **?** with a word that describes the group of radio buttons you want to create. Then press the **SPACEBAR** key.
3. To specify the information for one radio button, type **VALUE = "?"**, replacing **?** with a word that describes radio button.
4. If you want the radio button to be selected automatically, press the **SPACEBAR** key and then type **CHECKED**.
5. Type **>** to complete the radio button.
6. Type the text you want to appear beside the radio button on your web page.
7. Repeat steps **1** to **6** for each radio button you want to create.

- ***The web browser displays the radio buttons.***



Giving Radio Buttons in a Set of Different Names

- When **radio buttons** have different **NAME attributes**, the browser treats them as different radio button sets. This means, the user is able to turn on more than one of them at a time by clicking. Make sure all the radio buttons in a set have the same NAME attribute to avoid this.
- You can use the **CHECKED attribute** to show one radio button in the group as selected, by default.

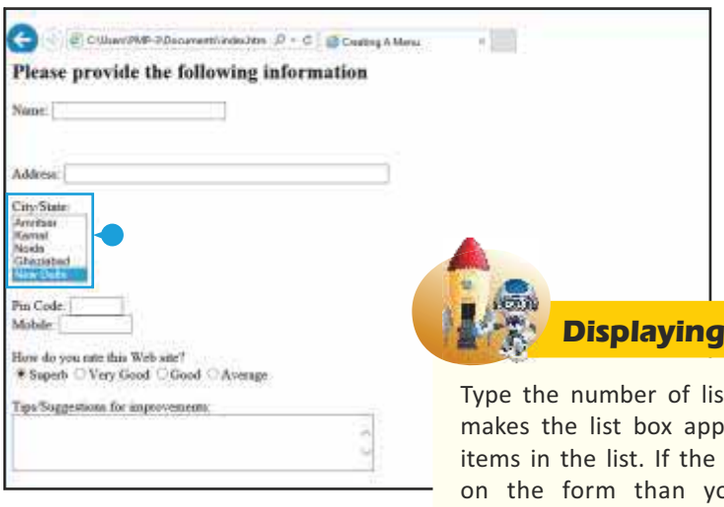
CREATING A LIST BOX (Menu)

You can create a list box that offers visitors a list of options to choose from. Normally, list boxes are used to display lists of products, states, age groups, etc. While creating a list box, you need to specify the following information:

- You need to specify a word that describes the list box. This is done using the **NAME attribute**.
- You need to specify a word that describes the content. This is done using the **VALUE attribute**.
- You need to specify the text you want to appear for each list box option on your web page.

```
<P>Name: <INPUT TYPE="text" NAME="urname" SIZE="30"
MAXLENGTH="20"></P>
<BR>Address: <INPUT TYPE="text" NAME="address" SIZE="60"
MAXLENGTH="50">
<BR><BR>City/State:
<BR><SELECT NAME="city" SIZE="5">
<OPTION VALUE="Amritsar">Amritsar
<OPTION VALUE="Karnal">Karnal
<OPTION VALUE="Noida">Noida
<OPTION VALUE="Ghaziabad">Ghaziabad
<OPTION VALUE="New Delhi" SELECTED>New Delhi</SELECT>
<BR><BR>Pin Code: <INPUT TYPE="text" NAME="Pincode"
SIZE="6" MAXLENGTH="6">
<BR>Mobile: <INPUT TYPE="text" NAME="mobile" SIZE="10"
MAXLENGTH="10">
<BR><BR>
How do you rate this Web site?
<BR><INPUT TYPE="radio" NAME="rate" VALUE="Superb"
CHECKED>Superb
<INPUT TYPE="radio" NAME="rate" VALUE="Very Good">Very
Good
<INPUT TYPE="radio" NAME="rate" VALUE="Good">Good
<INPUT TYPE="radio" NAME="rate" VALUE="Average">Average
<BR><BR>
Tips/Suggestions for improvements:
<BR>
```

1. Between the **<FORM>** and **</FORM>** tags, type **<SELECT NAME = "?"**, replacing **?** with a word that describes the list box you want to create. Then press the **SPACEBAR** key.
2. Type **SIZE = "?"**, replacing **?** with the number of options you want visitors to see in the list box, without having to use the scroll bar.
3. To specify the information for one list box option, type **<OPTION VALUE = "?">**, replacing **?** with a word that describes the list box content.
4. Type the text you want to appear for the list box option on your web page.
5. Repeat steps **3** and **4** for each list box option you want.
6. If you want a list box option to be selected automatically, press the **SPACEBAR** key and then type **SELECTED** after the VALUE attribute.
7. Type **</SELECT>**.



- *The web browser displays the list box.*

Displaying the Entire List Box List on the Form

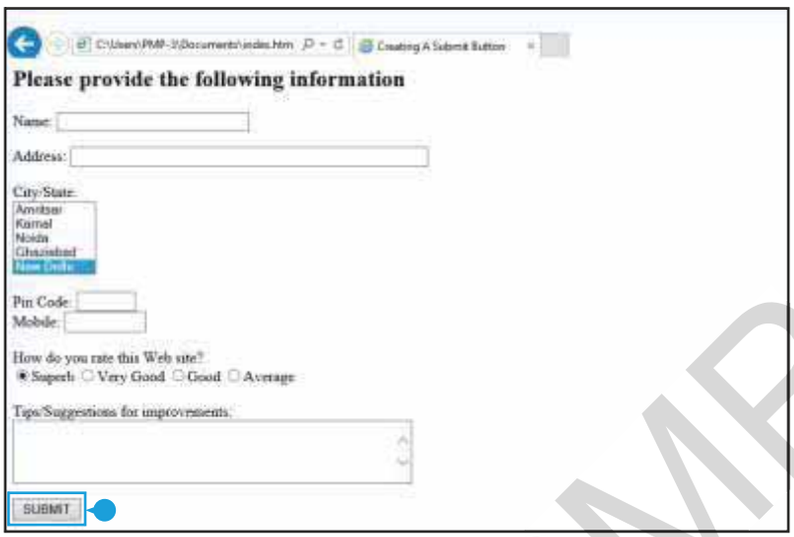
Type the number of list box entries as the SIZE attribute value. This makes the list box appear as a rectangular box that displays all the items in the list. If the list box list is long, it may take up more room on the form than you want, making users scroll to view the selections. If you prefer to save room on your form, keep the list box size as 1. This creates a **drop-down list**.

CREATING A SUBMIT BUTTON

You can create a submit button that visitors can click to send the information they entered in your form to your web server or your e-mail.

```
<BR>
<TEXTAREA NAME="comments" ROWS="4" COLS="50" WRAP>
</TEXTAREA>
<P><INPUT TYPE="Submit" VALUE="SUBMIT"></P>
</FORM>
</BODY>
</HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type **<INPUT TYPE = "Submit"**. Then press the **SPACEBAR** key.
2. Type **VALUE = "?"**, replacing **?** with the text you want to appear on the Submit button.



- ***The web browser displays the SUBMIT button.***

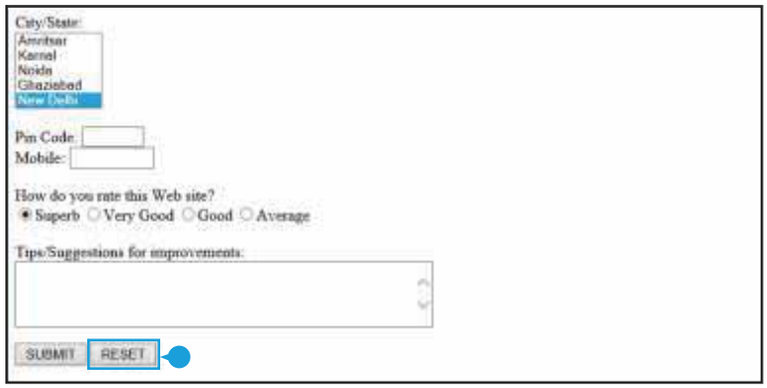
When the user clicks the Submit button, the data in the form is processed and sent to the destination specified in the <FORM> tag.

CREATING A RESET BUTTON

You can create a reset button that visitors can click to clear the information they entered in your form.

```
<P>
<INPUT TYPE="Submit" VALUE="SUBMIT">
<INPUT TYPE="Reset" VALUE="RESET">
</P>
</FORM>
</BODY>
</HTML>
```

1. Between the **<FORM>** and **</FORM>** tags, type **<INPUT TYPE = "Reset"**. Then press **SPACEBAR** key.
2. Type **VALUE = "?"**, replacing **?** with the text you want to appear on the Reset button.



- ***The web browser displays the RESET button.***

When the user clicks the Reset button, the form is reset to its original setting.

Adding Multimedia

You can incorporate multimedia elements into your HTML pages to, illustrate a product or service, or simply for aesthetic purpose.

You can deliver multimedia files to your website visitors in several ways. You can link page to an external media file, embed the file into your page, or stream the file. Make sure the files you use are in a format commonly used on the web. Whenever possible, you should use small files. Large files take a long time to transfer to a computer.

HTML5 features include native audio and video support without the need for Flash Player. The HTML5 **<audio>** and **<video>** tags make it simple to add media to a website. You need to set **src** attribute to identify the media source and include controls attribute so the user can play and pause the media.

EMBEDDING AUDIO

HTML5 supports **<audio>** tag which is used to embed sound content in an HTML document.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>AUDIO</TITLE>
</HEAD>
<BODY>
<H1 ALIGN="center"><FONT COLOR="#FF0000">Welcome To The Musical Section</FONT></H1>
<P ALIGN="CENTER"> <IMG SRC="musical.jpg"></P>
<H2 ALIGN="LEFT"><U><I>Music</I></U></H2>
<AUDIO SRC="song.mp3" AUTOPLAY CONTROLS> 2
</AUDIO> 3
</BODY>
</HTML>
```

1

1. Type **<AUDIO SRC="?"**, replacing **?** with the location or name of the sound file.
2. Press **SPACEBAR** key, and type **AUTOPLAY CONTROLS>**.
3. Type **</AUDIO>**.

- ***The web browser displays the music controls and starts playing the audio song because we have given Autoplay option.***

In some browsers, you need to click on Play button to start the audio.

Update Your Knowledge

The <audio> tag might not work in some browsers that do not support HTML5 and the file format. Currently, the file formats supported are **WAV**, **Mp3**, and **Ogg**.

EMBEDDING VIDEO

HTML5 supports **<video>** tag which is used to embed video content in an HTML document.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>VIDEO</TITLE>
</HEAD>
<BODY>
<H1 ALIGN="LEFT"><FONT COLOR="#FF0000">Welcome
To The Movie Section</FONT></H1>
<P ALIGN="LEFT"> <IMG SRC="video.jpg"></P>
<H2 ALIGN="LEFT"><U><I>Video</I></U></H2>
<VIDEO SRC="cow.mp4" WIDTH="300" HEIGHT="200"
AUTOPLAY CONTROLS>
</VIDEO>
</BODY>
</HTML>
```

1. Type **<VIDEO SRC="?"**, replacing **?** with the location or name of the video file.
2. Type **WIDTH="?"**, replacing **?** with the width measurement you want to set for video player.
3. Give a space by pressing the **SPACEBAR** key.
4. Type **HEIGHT="?"**, replacing **?** with the height measurement you want to set for video player.
5. Press **SPACEBAR** key, and type **AUTOPLAY CONTROLS>**.
6. Type **</VIDEO>**.

- ***The web browser displays the video and starts playing it because we have given Autoplay option.***

In some browsers, you need to click on Play button to start the video.

When you place your mouse pointer on the video, controls will appear.

Update Your Knowledge

The <video> tag might not work in some browsers that do not support HTML5 and the file format. Currently, the file formats supported are **MP4**, **WebM**, and **Ogg**.

The HTML5 audio and video tags can have a number of attributes to control the look and feel.

ATTRIBUTES	DESCRIPTION
AUTOPLAY	Plays the audio or video file automatically when the web page is loaded
CONTROLS	Displays the controls on the web page
SRC	Specifies the URL of audio or video file
LOOP	Replays the file in loop once it is finished
HEIGHT	Specifies the height of the video player displayed on the web page
WIDTH	Specifies the width of the video player displayed on the web page

Cascading Style Sheets (CSS)

In HTML, you use tags to alter the style (or look) of a web page. Altering the style of individual elements on a web page is an easy web development technique to use. With large websites, however, it is better to use Cascading Style Sheets to change the style of the web page elements. With **Cascading Style Sheets** or **CSS**, you write code that allows you to control an element within a single web page or throughout an entire website. For example, changing a heading color from black to red in a website that contains hundreds of pages is much easier to do using a CSS, instead of changing the individual headings.

A style sheet is usually a text file that is separate from your HTML document. Style sheet can also be internal, residing within your HTML code. A style sheet holds formatting codes that control your web page appearance.

You can use style sheet to change the look of any web page element, such as paragraphs, lists, backgrounds, and more. Whenever you want to apply the formatting from an external style sheet to an HTML document, you can attach the style sheet to the page using a LINK tag. Style sheet files have a **.css** file extension.

Controlling Multiple Pages

You can link every page in your website to a single style sheet. Any changes you make to the style sheet formatting are reflected in every HTML document linked to the sheet. By storing all the formatting information in one place, you can easily update the appearance of the web pages of your site in one single action. This can be a real time-saver if your site consists of a lot of pages.

Style Sheet Syntax

Style sheets are made up of rules, and each rule has two distinct parts: a **selector** and a **declaration**. The selector specifies the element to which you want to apply a style rule, and the declaration specifies the formatting for the selector. For example, in the style rule **H2 {color: silver}**, the **selector** is **H2** and **{color: silver}** is the **declaration**. When applied to a page, this rule will make all level 2 headings appear in silver.

DIV Tag

DIV tag is used for defining a section of your document. With this tag, you can group a large section of HTML elements together and format them with CSS. The DIV tag also allows you to define characteristics for several types of elements at once. For example, the DIV tag can be used to center headings and paragraphs at the same time.

INLINE, INTERNAL, AND EXTERNAL STYLE SHEETS

You can connect an HTML document to an inline, internal, and external style sheet.

Inline style sheet is used to apply a unique style to a single HTML element. It uses the style attribute of an HTML element. E.g., **<h1 style = "color: blue"> This is a blue heading. <h1>**. It sets the text color of the <h1> element to blue.

Internal style sheets exist within an HTML page between the <HEAD> and </HEAD> tags while external style sheets are separate files.

External style sheets are useful because you can link them to more than one HTML document.

INTERNAL STYLE SHEET

An **internal style sheet** is used to define a style for a single HTML page. You can create an internal style sheet that resides within the <head> tags of your HTML5 document. The styles of an internal style sheet are defined by **<style>** and **</style>** tags, and apply only to the HTML in that document.

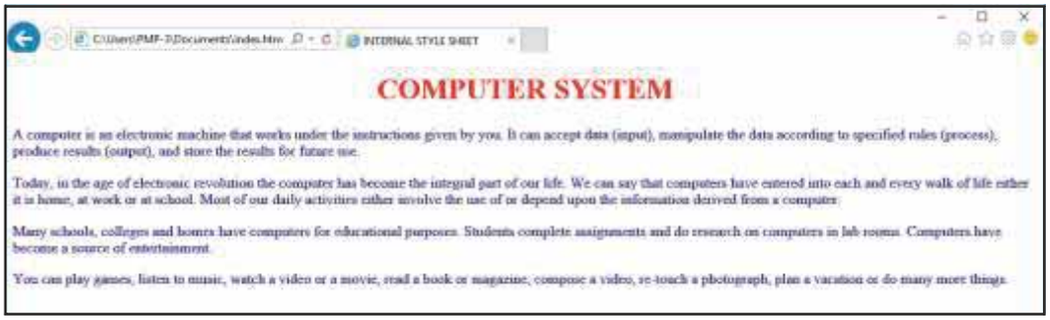
```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>INTERNAL STYLE SHEET</TITLE>
<STYLE>
H1{
</HEAD>
<BODY>
<H1><CENTER>COMPUTER SYSTEM</CENTER></H1>
<P>A computer is an electronic machine that works under the
instructions given by you. It can accept data (input), manipulate the data
according to specified rules (process), produce results (output), and store
the results for future use.</P>
<P>Today, in the age of electronic revolution the computer has become
the integral part of our life. We can say that computers have entered into
each and every walk of life either it is home, at work or at school. Most
of our daily activities either involve the use of or depend upon the
```

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>INTERNAL STYLE SHEET</TITLE>
<STYLE>
H1{text-align:center;color:red}
P{color:blue}
</STYLE>
</HEAD>
<BODY>
<H1><CENTER>COMPUTER SYSTEM</CENTER></H1>
<P>A computer is an electronic machine that works under the
instructions given by you. It can accept data (input), manipulate the data
according to specified rules (process), produce results (output), and store
the results for future use.</P>
<P>Today, in the age of electronic revolution the computer has become
```

1. On the web page, type **<STYLE>** between **<HEAD>** and **</HEAD>** tags to use a style sheet.
2. Type a tag you want to define characteristics for. You can define characteristics for tags, such as H1(H1 headings), P(paragraphs), and B (bold text).
3. Type **{** and write the characteristics for the tag.
4. Type **}** to end the characteristics for the tag.

- Enter characteristics for the tag between the curly brackets { }. A semicolon (;) must separate each characteristic.

5. Repeat steps **2** to **4** for each tag you want to define characteristics for.
6. Type **</STYLE>** to complete the style sheet.

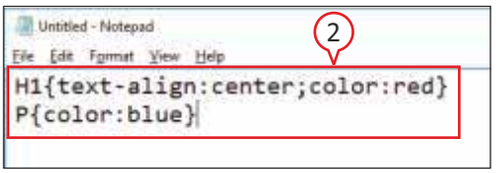


The web browser displays the style specified for the web page.

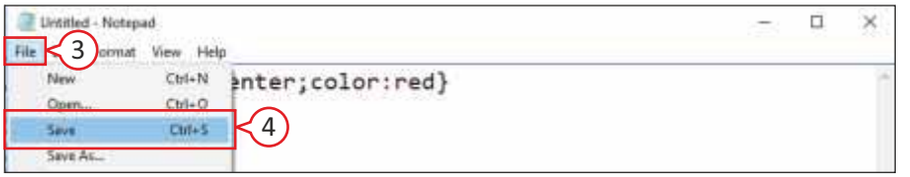
EXTERNAL STYLE SHEET

You can use an **external style sheet** to define formatting and layout instructions, and then link it to more than one HTML document. You can save the style sheet as a text file and assign the **.css** file extension to identify the file as a Cascading Style Sheet.

Set Up a Style Sheet for Multiple Web Pages

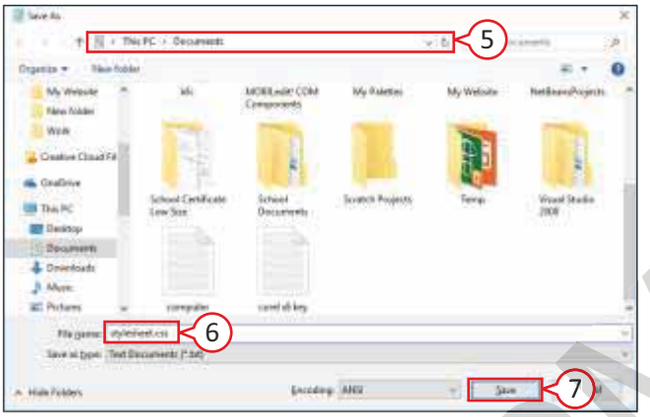


1. Create a new document in a text editor.
2. Perform steps **2** to **5** of the section of previous page (Internal Style Sheet) to set up the information for style sheet.



3. Click on **File** menu.
4. Click on **Save** *(or press Ctrl+S)*.

The **Save As** dialog box appears.



5. Navigate to the folder that contains your HTML pages.
6. Type a unique file name for your style sheet with a **.css** extension. In this example, we have given the name as **stylesheet.css**.
7. Click on **Save**.

Text editor saves the new style sheet.

Link to a Style Sheet

You can link to a style sheet to assign a set of formatting rules to your HTML document. You can also link multiple documents to the same style sheet to give all the pages in your site a consistent look and feel. The **<LINK>** tag is used for linking current document to multiple documents.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>EXTERNAL STYLE SHEET</TITLE>
<LINK REL = stylesheet TYPE ="text/css" HREF = stylesheet.css>
</HEAD>
<BODY>
<H1><CENTER>COMPUTER SYSTEM</CENTER></H1>
<P>A computer is an electronic machine that works under the
instructions given by you. It can accept data (input), manipulate the data
according to specified rules (process), produce results (output), and
```

1. Type **<LINK REL = stylesheet TYPE = "text/css"** between the **<HEAD>** and **</HEAD>** tags. Then press **SPACEBAR** key.
2. Type **HREF=?>** replacing **?** with the name or location of the style sheet.

The web browser displays the style specified for the web page.

INDENTING TEXT THROUGH CSS

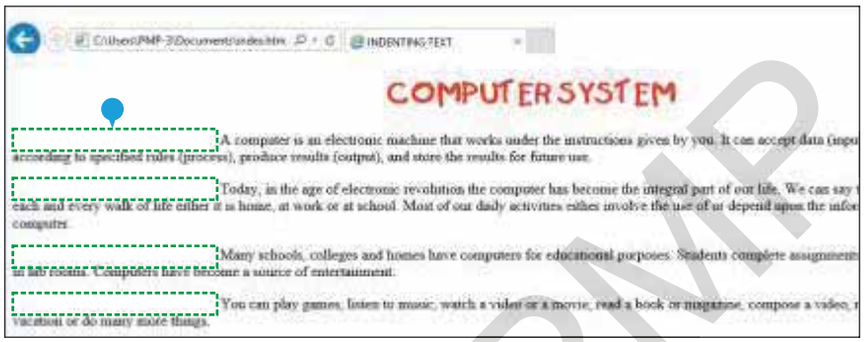
An **indent** is the space between the margin and the text. The indent feature is often used to set a first-line indent for paragraphs. You can indent the first line of all the paragraphs of the text on your web page that uses text-indent property in style sheet.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>INDENTING TEXT</TITLE>
<STYLE>
H1{font-family:kids;text-align:center;color:red}
P{text-indent:20%}
</STYLE>
</HEAD>
<BODY>
<H1><CENTER>COMPUTER SYSTEM</CENTER></H1>
<P>A computer is an electronic machine that works under the instructions given by you. It can accept data (input),
```

1 2 3

First set up a style sheet.

1. To indent the first line of all the paragraphs of the text that uses a specific tag, position the cursor between the **brackets { }** for the tag.
2. Type **text-indent:** and then press **SPACEBAR** key.
3. Type the amount of space for the indent as a percentage of the window (example, 20% or 30%) or in pixels (example, 20px or 30px).



- ***The first line of all the paragraphs in the text that uses the tag is indented by the web browser.***

CHANGING MARGIN THROUGH CSS

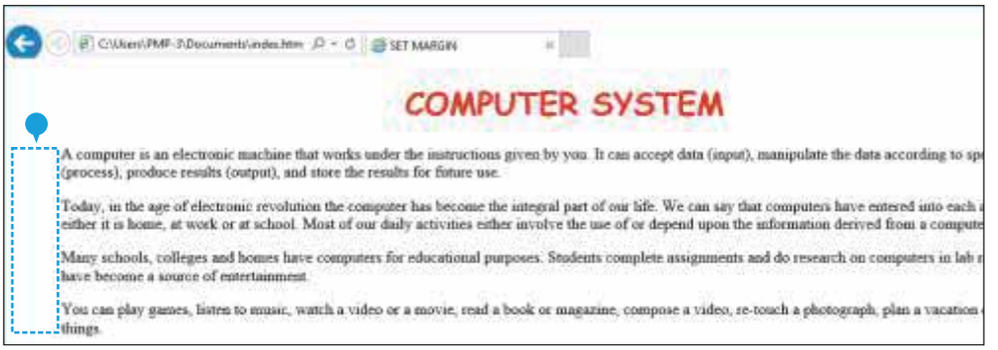
The amount of space that appears around an element is referred to as **margin**. Margins can be set for any web page element with the margin property. This property can accept four values for the **top**, **right**, **bottom**, and **left** edges. You can include two values as an alternative to four values. These two values set the top and bottom margins to the first value, and the right and left margins to the second value. The values can be measured in pixels (px) or as a percentage of the window. For example, **margin: 50px** would create a margin that is 50 pixels in width.

```
<!DOCTYPE html>
<HTML>
<HEAD>
<TITLE>SET MARGIN</TITLE>
<STYLE>
H1{font-family:Comic Sans MS;text-align:center;color:red}
P{margin-left:50px}
</STYLE>
</HEAD>
<BODY>
<H1><CENTER>COMPUTER SYSTEM</CENTER></H1>
<P>A computer is an electronic machine that works under the
```

1 2 3

First set up a style sheet.

1. To change the margin for every element that uses a specific tag, position the cursor between the **brackets { }** for the tag.
2. Type **margin-?:** replacing **?** with the margin you want to change (**left, right, top,** or **bottom**), and then press **SPACEBAR** key.
3. Type the amount of space for the margins in pixels (example 50px).



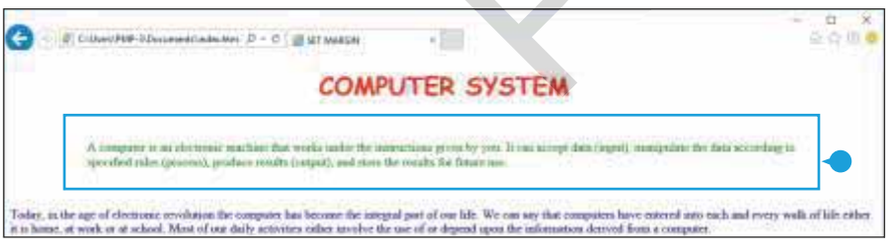
- **Every element that uses the tag with the margin you specified is displayed in the web browser.**

CHANGING MARGIN USING DIV TAG

If three values are included, the top edge gets the first value, the left and right edges get the second value, and the bottom edge gets the third value. If only one value is listed for the margin property, this value is applied equally to all four edges.

```
<STYLE>
H1{font-family:Comic Sans MS;text-align:center;color:red}
P{color:blue}
div{color:green;margin:50px 100px 50px 100px}
</STYLE>
</HEAD>
<BODY>
<H1><CENTER>COMPUTER SYSTEM</CENTER></H1>
<P><div>A computer is an electronic machine that works under the
instructions given by you. It can accept data (input), manipulate the
data according to specified rules (process), produce results (output),
and store the results for future use.</div></P>
<P>Today, in the age of electronic revolution the computer has
```

1. Add the margin style property in **div{**.
2. Set the margin property by assigning values to **top**, **right**, **bottom** and **left** margins.
3. Type ** ** in front of the text you want to display as a margin.
4. Type ** ** after the text you want to display as a margin.



- ***The first paragraph now has margins on each side.***

The following table shows you how to apply formatting to your HTML5 elements using Style Sheet properties in a paragraph.

HTML Formatting Element	Property in Style Sheet	Example
Bold Text	`font-weight` Property	`P{font-weight: bold}`
Italic Text	`font-style` Property	`P{font-style: italic}`
Font Size	`font-size` Property	`P{font-size: 12pt}`
Font	`font-family` Property	`P{font-family: "Arial"}`
Change Case	`text-transform` Property	`P{text-transform: uppercase}`
Text Alignment	`text-align` Property	`P{text-align: center}`
Line Spacing	`line-height` Property	`P{line-height : 2.0}`
Text Color	`color` Property	`P{color: red}`
Background Color	`background` Property	`P{background: blue}`
Bullet	`list-style` Property	`UL{list-style: square}`
Number	`list-style` Property	`OL{list-style: decimal}`

Self-Evaluation

After reading the chapter, I know these points:

	CHECKLIST	
	Agree	Disagree
⊙ I know that forms provide an easy way to collect required information from web page visitors.	☐	☐
⊙ I know that web page forms have three important parts: a <FORM> tag, form input elements, and a Submit button.	☐	☐
⊙ I know that HTML5 supports audio tag and video tag which are used to embed audio and video in a web page.	☐	☐
⊙ I know that we can add CSS in our HTML documents to exercise precise control over the appearance.	☐	☐
⊙ I know that we can connect an HTML document to an Inline, Internal, and External Style Sheet.	☐	☐

Exercises

A. Tick (✓) the correct answer.

1. ..... provides an easy way to collect required information from web page visitors.
   a. Link ☐ b. Form ☐ c. Image ☐
2. ..... control limits the web page visitor to only one choice from a list of choices.
   a. Radio ☐ b. Checkbox ☐ c. Select ☐
3. ..... button is used to send the information entered in the form to the web server.
   a. Reset ☐ b. Close ☐ c. Submit ☐
4. To add media to a website, ... attribute is used to identify the media source.
   a. IMG ☐ b. HREF ☐ c. SRC ☐
5. An ..... style sheet is used to define a style for a single HTML page.
   a. inline ☐ b. external ☐ c. internal ☐

B. Write 'T' for True and 'F' for False statements.

1. A text control creates a text box that is used for a single line of input. ☐
2. A password text box displays the characters entered by a user as asterisks (*). ☐
3. The Reset button sends the information to the appropriate location for processing. ☐
4. By adding multimedia, website messages get enhanced. ☐
5. External style sheets define formatting and layout instructions. ☐

C. Fill in the blanks.

1. The ..... button is used to clear the already entered data in a form.
2. ..... control attribute is used to play the media when the web browser is displayed.
3. ..... attribute is used to replay the file once it is finished.
4. ..... style sheet is used to apply a unique style to a single HTML element.
5. The ..... tag is used for linking current document to multiple documents.

D. Define the following.

1. Text box: .....

.....

2. Password box: .....

.....

E. Differentiate between the following.

1. Checkbox	Radio Button
.....	.....
.....	.....
.....	.....
2. Internal Style Sheet	External Style Sheet
.....	.....
.....	.....
.....	.....

F. Answer in 1-2 sentences.

1. What is the use of a form in HTML?

.....

.....

2. Name the various input controls of a form.

.....

.....

3. Why do we add multimedia in web pages?

.....

.....

4. What is the use of DIV tag?

.....

.....

G. Answer briefly.

1. What are the uses of Submit and Reset buttons in the form?

.....

.....

.....

2. Which attributes are used to control audio and video tags?

.....

.....

.....

3. What are the benefits of using CSS with HTML documents?

.....

.....

.....

H. Application-based Question

Abhinav has been asked to create a form in HTML to get feedback from the users about the web page created by him. The feedback should be based on four choices— Excellent, Good, Average, and Poor. Which control, Radio control or Checkbox control, should he use in his form and why?

.....

Group Discussion

Divide the students into groups and discuss on the topic– 'Pros and Cons of using CSS in HTML'.

Online Link

To learn more about form, multimedia and CSS in HTML, visit the website:

https://codeclubprojects.org/en-GB/webdev/project-showcase/

Activity Section

Lab Activity

Type the HTML code to get the given output in the web browser.

GENERAL ENQUIRY FORM

First Name Last Name

Address

City Pin code

Mobile

Email Submit

Skill Formation

This activity will make the students
- create an interactive interface for data collection and will enhance their designing skills.

Technology Trailblazers

Marissa Mayer

? Former CEO: Yahoo YAHOO! **YEAR: 2012**

Marissa Mayer was born on May 30, 1975 in Wausau, Wisconsin, United States. She led the development of Google's most successful products for more than ten years and was appointed the CEO of **Yahoo**! in 2012, at the age of 37.

Prior to joining Yahoo!, she spent thirteen years at Google where her work in product development largely contributed to **Gmail**, a free e-mail service; **Chrome**, a web browser; **Google Maps**, a mapping and directions service; and **Google Earth**, which provides detailed satellite images of Earth.

At the time of Mayer's Yahoo! appointment, she was one of the only 20 female CEOs in charge of a Fortune 500 company. In 2017, Mayer resigned from Yahoo!. She is presently the co-founder of Sunshine Contacts.

8 App Development

OBJECTIVES

After completing this chapter, you will be able to:

- Differentiate between Android and iOS.
- Understand about different types of apps.
- Understand some popular app categories and their uses.
- Develop an app using MIT App Inventor.
- Test and run app on Android and Emulator.

Introduction to App

Apps

An **app**, sometimes called **application software**, consists of programs designed to make users more productive and/or assist them with personal tasks. It can run on a mobile phone, computer, or any Internet-enabled electronic device.

The app is a modern name for the word **application** or **software**. The term 'app' is originally referred to as any mobile or desktop application. But as more app stores have emerged to sell mobile apps to smartphone and tablet users, you probably only hear the word 'app' in reference to a mobile app and web app, which is a small piece of software running on a website.

There are thousands of apps designed to run on today's smartphones and tablets. Some apps can be downloaded for free, while others must be purchased from an app store. **Apple's App Store** and **Google's Play Store** are two examples of popular app stores.

Apple's App Store

Google's Play Store

ANDROID AND iOS

Most of the mobile devices run on iOS or Android.

iOS is an operating system developed and supported by **Apple** and is used only on their own iPhones and iPads.

Android is an operating system for mobile computing devices developed by **Google**. It is widely used on smartphones and tablet computers.

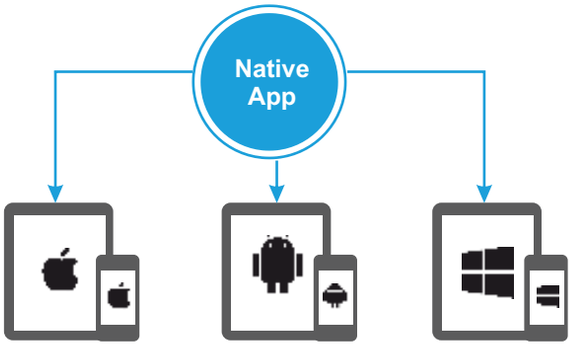
Types of Apps

Apps are software programs that provide specific functionality to your phone or tablet in a simple, more user-friendly way. Nowadays, there seems to be an app for everything. Whether it is checking up on breaking news, chatting with friends via social networking or even booking last minute holidays, there's an app out there to help you. These apps are divided into three types.

1. Native App
2. Web App
3. Hybrid App

NATIVE APP

Native apps are developed for a particular platform or device. Apps built for systems like iOS, Android, Windows phone, and Blackberry cannot be used on a platform other than their own. In other words, you cannot use Android app on iPhone. The majority of the apps on your mobile device are native apps. They are installed directly onto the device. These apps are distinctly accessible from app stores of their kind. Native apps offer the fastest, most reliable and most responsive experience to users.



Native apps have access to various devices of a phone, such as its camera, microphone, compass and address book. It is still possible to use the alternatives, but using native app is the easiest. In addition, users can use some apps ever without an Internet connection.

WEB APP

Web apps are actually websites that provide a user with experience similar to native apps. They are not deployed to an app store; rather, they are deployed to a web server and users access them in a web browser from any device with an Internet connection. Developers write the Web app by using technologies including HTML5, CSS, and JavaScript. Many web apps use **responsive design**, which means the app displays properly on any computer or mobile device.

Both the **website** and **web app** run on browser, but the major difference is that website generally gives information whereas a web app provides functionality. For example, Wikipedia is a website; it provides information, and Facebook is a web app; it provides functionality.

In contrast, a **mobile app** is a software you download from app store of a mobile device or other location on the Internet to a smartphone or other mobile device. A mobile web app is a web app that is optimized for display in a browser or on a mobile device, regardless of screen size or orientation.

HYBRID APP

A **hybrid app** is the combination of both native and web app elements. Native is developed for specific platform and installed on the computing device. Web app is generalized for multiple platforms and not installed on computing device but made available over the Internet through browser.

Like native apps, hybrid apps are developed for specific platforms and deployed to an app store. They can access many hardware features of a device, such as its camera. Like web apps, they are built with HTML5, CSS, and JavaScript. Developers use development tools to package this code with a browser and prepare it as a native for deploying to popular app stores.

In this way, hybrid apps are cross-platform, it means the same code can run on many mobile platforms. This approach often saves development time and cost, but may not provide a consistent user experience or fast performance on all devices.

Categories of Apps

Nowadays, mobile phones are affordable to by all across the world, so the app industry has absolutely exploded in the last few years. Apps have become an integral part of today's life. People are using mobile phones not only to make calls, but mainly for using apps. They tend to do business, communicate, entertain, play games, educate themselves, etc. by using apps. This has lead to the development of many different types of apps.

Apple's App Store and **Google's Play Store** are two popular app stores which contain many app categories as well as subcategories.

Now, we will discuss some of the popular app categories and their uses.

GAMING APPS

Gaming app helps the user improve their cognitive skills, such as attention and focus. Some gaming apps encourage children to learn through play. These also help find friends who play the same game and post their scores on social media.

Examples of game apps you can play by yourself or with friends are:

- Clash of Clans
- Candy Crush Saga
- Angry Birds Go
- Temple Run
- Solitaire
- Trivial Crack

BUSINESS APPS OR PRODUCTIVITY APPS

Modern-day smartphones are capable of performing many complex tasks on the go. Productivity apps are developed to help us be more productive.

Examples of productivity apps are:

- Google Calendars
- Translators
- To-do-list
- Evernote
- Image Editing
- Dropbox

ENTERTAINMENT APPS

Entertainment apps are designed to entertain the users. These apps have a tendency to keep the users engaged, logged in, and always checking for updates. Entertainment apps are different from gaming apps because they often have quite different goals, even though both of them seek to entertain the user.

Examples of entertainment apps are:

- Netflix
- Voot
- Talking Tom Cat
- Amazon Prime Video
- YouTube
- Hotstar

UTILITY APPS

Utility app is used by everyone of us on a daily basis. These contain handy tools and help you perform simple tasks.

Examples of utility apps are:

- Flashlight
- QR or Barcode Reader
- Internet Speed
- Calculator
- Xzender
- Kaagaz Scanner

TRAVEL APPS

The main purpose of travel apps is to make your traveling easier, more comfortable, fun and memorable. You can book your flights, hotels, trains, taxis, in fact any mode of transport with the use of a travel app. These apps also help you explore unknown locations.

Examples of travel apps are:

- Google Earth
- Google Maps
- MakeMyTrip
- Goibibo
- Ola
- Uber
- Google Trip
- TripAdvisor
- Airbnb

EDUCATIONAL APPS

Educational apps are making things easier for children to study. These apps can make teaching and exploring more interactive. Kids can learn while playing educational game apps. Moreover, many educational apps are useful for teachers as well by organizing a teaching process, better educating themselves, etc.

Examples of educational apps are:

- Ted
- Duolingo
- Khan Academy
- Lynda
- PhotoMath
- SoloLearn
- Udacity
- YouTube
- Coursera

SOCIAL NETWORKING APPS

Social networking apps enable you to connect with people who share similar personal or professional interests. The main purpose of using social networking apps is to keep track of what is going on in the lives of friends, family and colleagues, especially the people whom you do not meet regularly. It also helps us expand the circle of friends and business contacts.

Examples of social networking apps are:

- Facebook
- LinkedIn
- Hangouts
- Instagram
- WhatsApp
- Telegram
- GroupMe
- Twitter
- Snapchat

COMMUNICATION APPS

Communication apps enable you to impart or interchange thoughts, opinions, or information by speaking, writing, or through signs.

Examples of communication apps are:

- WhatsApp
- TrueCaller
- Imo
- Skype
- hike
- FaceTime

SHOPPING APPS

Shopping apps enable you to purchase a product by placing the order and pay through credit/debit card on the Internet so that the product is delivered at your home.

Examples of shopping apps are:

- Amazon
- Flipkart
- Snapdeal
- Paytm Mall
- ShopClues
- eBay

Developing an App

Mobile app is an application you download from app store of a mobile device or other location on the Internet to a smartphone or other mobile device. You can also create an app for your Android mobile device.

There are many free app development software available on the web. These software helps you to build your own apps. In this section, we are using the app building software called **MIT App Inventor**.

MIT APP INVENTOR

MIT App Inventor is an open-source web application originally provided by **Google**, and now maintained by the **Massachusetts Institute of Technology (MIT)**. It lets you develop apps or applications for Android phones using a web browser. It is very easy and user-friendly. The App Inventor programming environment has three key parts:

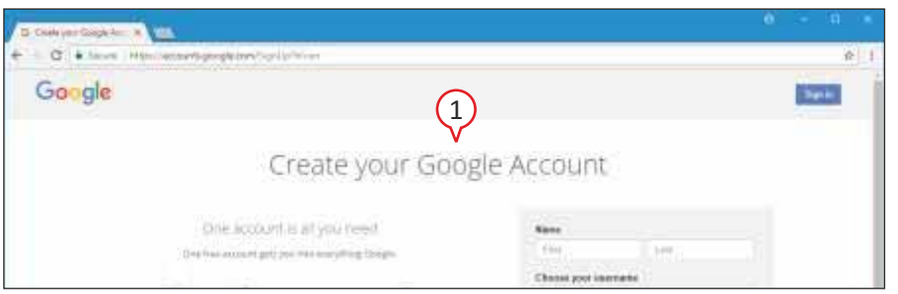
1. **Component Designer:** You use it to select components and specify their properties.
2. **Blocks Editor:** You use it to specify how the components will work.
3. **Android Device (phone/tablet) or Emulator:** You use it to run and test your app as you are developing it. If you do not have an Android device, you can test the app you build by using the Android emulator that comes with the system.

Note: *MIT App Inventor is compatible with* ***Google Chrome, Mozilla Firefox*** *and* ***Safari****. In this chapter, we will use* ***Google Chrome*** *as a web browser.*

CREATING AN APP FOR ANDROID

Follow the instructions and steps to develop your first android app called **HelloWorld**. In this app, you will see five components on the screen—TextBox, Button, Label, TextToSpeech and Image.

- **Textbox** component is used to enter the text.
- **Button** component is used to initiate an action.
- **Label** component is used to show text on the screen.
- **TextToSpeech** enables your Android device to speak the text.
- **Image** enhances the appearance of the app.



1. Create a **Google Account**.

With your Google account, you can use all the services of Google like Gmail, Google Drive, etc.

If you already have a Google Account, skip this step.

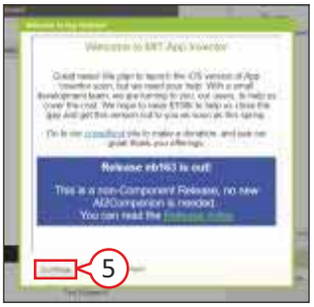
2. In the Address bar of your web browser, type **www.appinventor.mit.edu** and press the **Enter** key.

The home page of **App Inventor** appears.

3. Click on **Create apps!**.

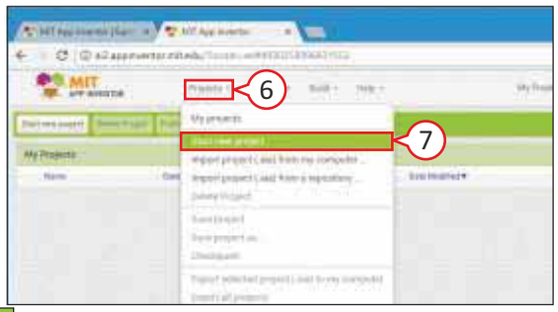
Google **Sign in** page appears.

4. Type your **user name** and **password** that you have created in step 1 and click on **Sign in**.



The **Welcome to MIT App Inventor** page appears.

5. Click on **Continue**.

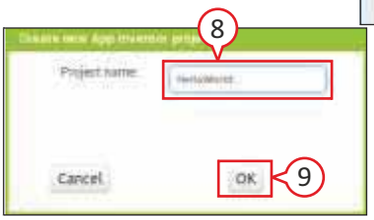


6. Click on **Projects** option.

A menu appears.

7. Click on **Start new project**.

Create new App Inventor project box appears.



8. Type the name for your project in the **Project name** box.

In this example, we have given the name 'HelloWorld'.

9. Click on **OK**.

App Inventor opens the **Component Designer** window.

In Component Designer window, you will create the look and feel of your app. You can choose components like Buttons, Images, and Text boxes, and functionalities like Text-to-Speech.

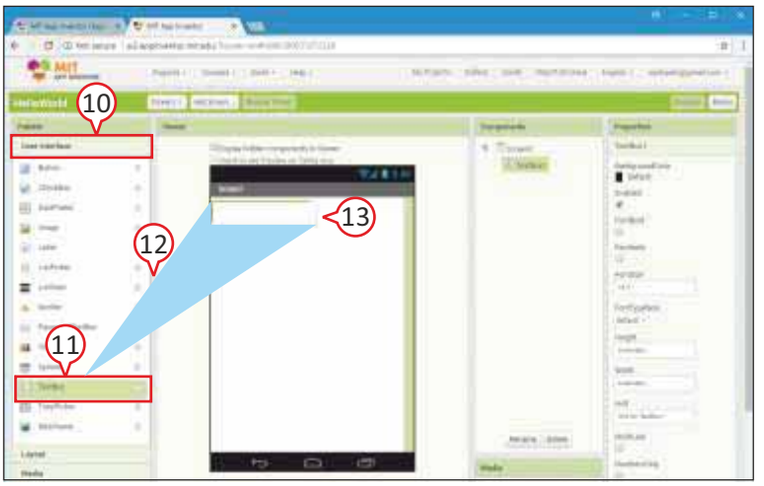
The **Component Designer** window is divided into four areas:

Components Palette: On the left, there is a **Palette**, which is a list of components from which you can select.

Viewer: To the right of the palette is the white area called the **Viewer**. Here you can place the components to map out how you want your app to look like.

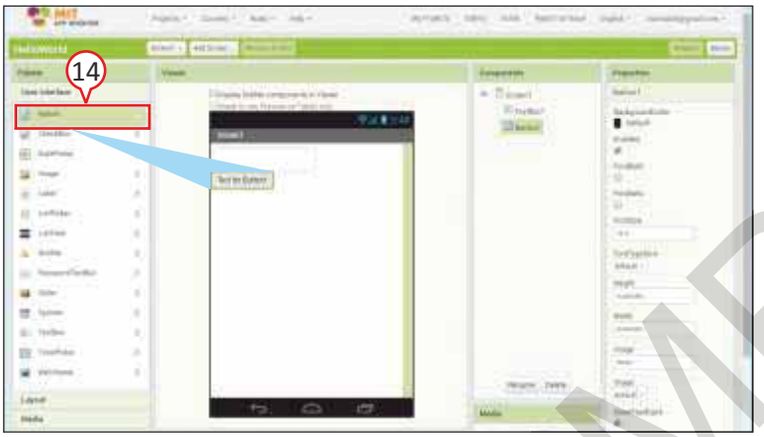
Components List: To the right of the Viewer is the **Components** list. Any component that you place into the Viewer will also show up in this list.

Components Properties: To the far right is the **Properties** of components; when you click a component in the viewer, you will see its properties listed here. Properties are details about each component that you can change.



10. In **Components Palette**, open the **User Interface** drawer if it is not open.
11. Click and hold on the **TextBox** in the Palette.
12. Drag your mouse over to the Viewer.
13. Release the mouse.

*A new TextBox appears on the **Viewer**. It also appears in **Components List** and **Properties**.*



14. Click and drag **Button** from the Palette to the Viewer.

*A new Button appears on the **Viewer**. It also appears in **Components List** and **Properties**.*

15. Click and drag **Label** from the Palette to the Viewer.

*A new Label appears on the **Viewer**. It also appears in **Components List** and **Properties**.*

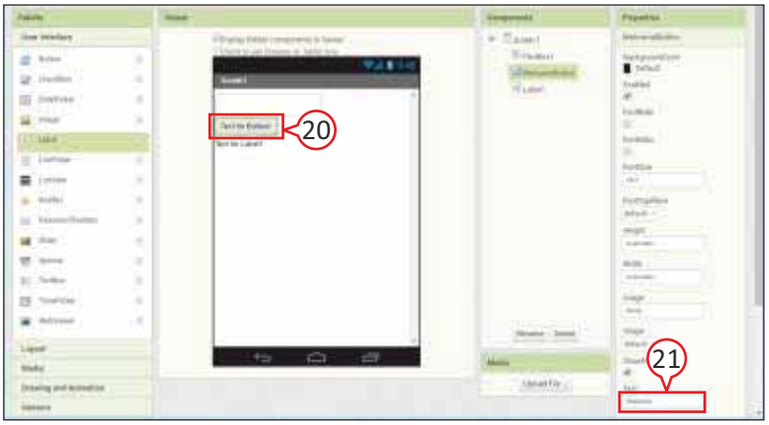
In the **Components List**, Button is displayed as 'Button1'. You can rename it.

16. Click on the **Button1** in Components List.
17. Click on **Rename**.

Rename Component dialog box appears.

18. Type the **New name** for the component. In this example, we have given **WelcomeButton** as new component name.
19. Click on **OK**.

The new name for the button appears in the Components List. You might have also noticed that in the **Viewer**, Button still has the words 'Text for Button1' displayed on it. You probably do not want that in your app, so go ahead and change it in the Text Properties.



20. Click on the **Button** in Viewer.
21. In the Components Properties, click the area under **Text** and type the name for the button. You will see the text changes in the Viewer.

In this example, we have changed the name as **Welcome**.

You can also change other properties of the selected component, e.g. font size, font shape, color of the text, etc.

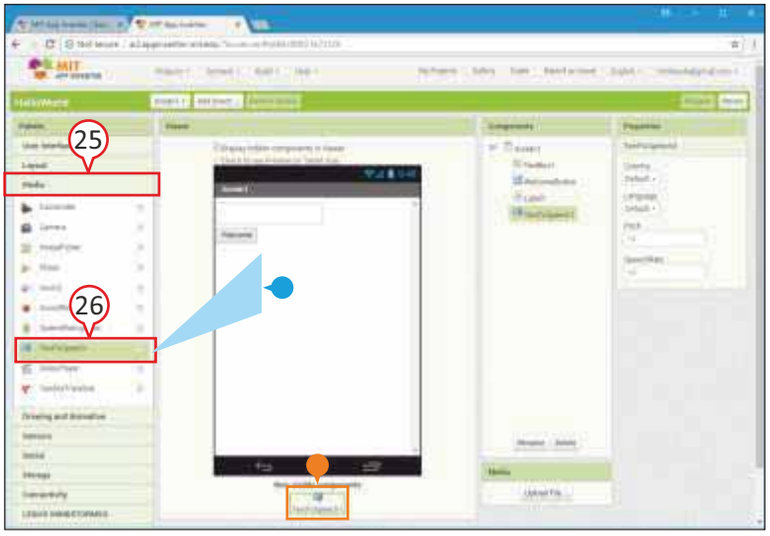
In the **Viewer** the Label has 'Text for Label1' displayed on it. You probably do not want that in your app, because it is used to show your text on screen; so go ahead and remove it in the Text Properties.

22. Click on the **Label** component in Viewer.
23. In the Components Properties, click the area under **Text** and remove the text written in it.

You will see that the text will be removed from Viewer.

24. Click the area under **FontSize**, and change the font size from 14 to 25.

It will show the final message in a new font size.



25. In Palette, open the **Media** drawer.
26. Click and drag **TextToSpeech** from the Palette to the Viewer.

- This component does not appear in the Viewer.
- It drops down under 'Non-visible components' because it is not something that will show up on the app's user interface. It is more like a tool that is available to the app.

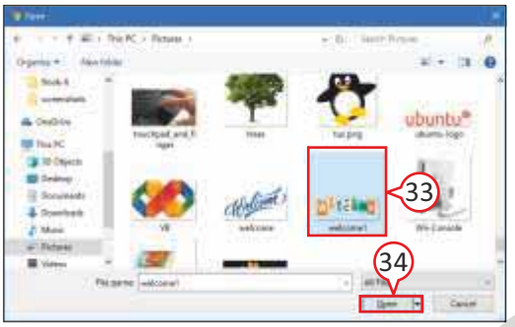
It will also appear in **Components List** and **Properties**.

27. In **Components Palette**, open the **User Interface** drawer.
28. Click and hold on **Image** component.
29. Drag your mouse over to the Viewer.
30. Release the mouse.

*A new Image appears on the **Viewer**. It will also appears in **Components List** and **Properties**.*

31. Click on **Upload File** in Media section.
32. Click on **Choose File**.

Open Dialog box appears.



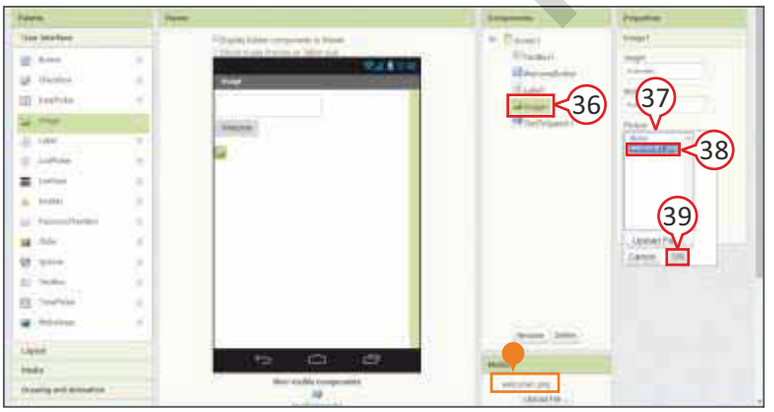
33. Navigate the file you want to upload and click on it.

***Note:** You should upload a small size picture as bigger picture will cover the whole screen.*

34. Click on **Open**.

- The name of uploaded picture appears here.

35. Click on **OK**.



- The name of uploaded picture also appears in Media section.

36. Click on **Image1** in the Components list.
37. Click on **Picture** box in the Properties panel.

A box appears with the name of uploaded image.

38. Click on the image name.
39. Click on **OK**.

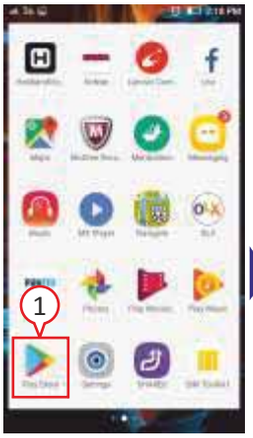
- The image file appears in the Viewer pane.
- You can adjust the setting of image from the Properties pane.

The components we have added to the HelloWorld app

Component type	Palette group	Name of component	Purpose
TextBox	User Interface	TextBox1	Enter the text
Button	User Interface	WelcomeButton	Press to show the message
Label	User Interface	Label1	Show the message
TextToSpeech	Media	TextToSpeech1	Speak the message
Image	User Interface	Image1	Show the image

TESTING APP IN ANDROID DEVICE

You can view and test your app on an Android device as you create it. If you have an Android device and an Internet connection, do the following:



1. Tap the **Play Store** icon on Apps screen.

Play Store app opens and displays the Google Play screen.

2. Type **MIT AI2 Companion** in the Search box.

App info page appears.

3. Tap on **INSTALL**.

Downloading and installing the app process starts.

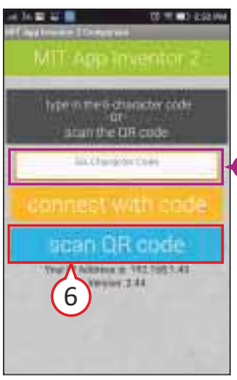
The icon of app appears in the App screen.

Now, you can run this app by tapping its icon.

App appears in the device after tapping its icon.

4. In App Inventor (in the browser), click on **Connect**.
5. Click on **AI Companion**.

- **Connect to Companion** dialog box appears showing the **QR code** (quick response code) and **six digits** code.



6. On your device, launch the app you installed and select scan **QR** code, and then hold your device up to the QR code on the computer screen to scan it.

- ***Or*** enter the six digit code shown on the computer screen into the mobile device.

*If everything is done, you should see the **HelloWorld** app running on your mobile device.*

Now, whatever changes you will do in the App Inventor, those changes will appear on the device as well.

TESTING APP IN EMULATOR

If you do not have an Android device, you will need to perform some additional setup in order to use the **emulator**. For that, you have to and install app inventor software into your computer.

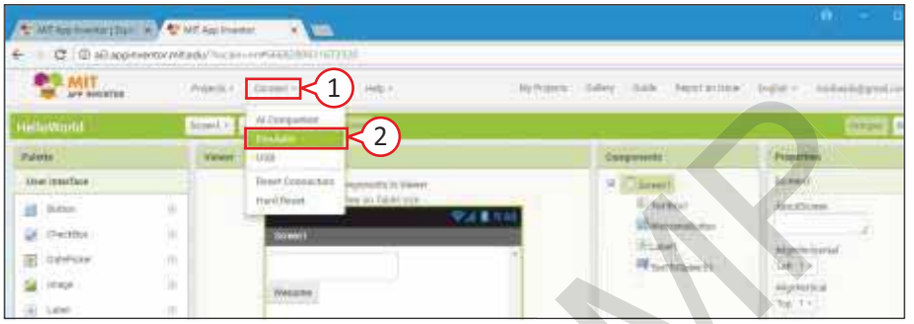
You can download the app inventor from:
http://appinventor.mit.edu/explore/ai2/windows.html

Typically, it will go into your **Downloads** folder. From there, you can install it.

After installing in Windows, **aiStarter** icon may appear on your desktop or you can get it from the Start menu. If you want to use the emulator with App Inventor, you will need to manually launch aiStarter on your computer, when you log in. You can start aiStarter by clicking the icon on your desktop or using your Start menu or using the path.

The software is installed under the path:

C:\Program Files\Appinventor\commands-for-Appinventor



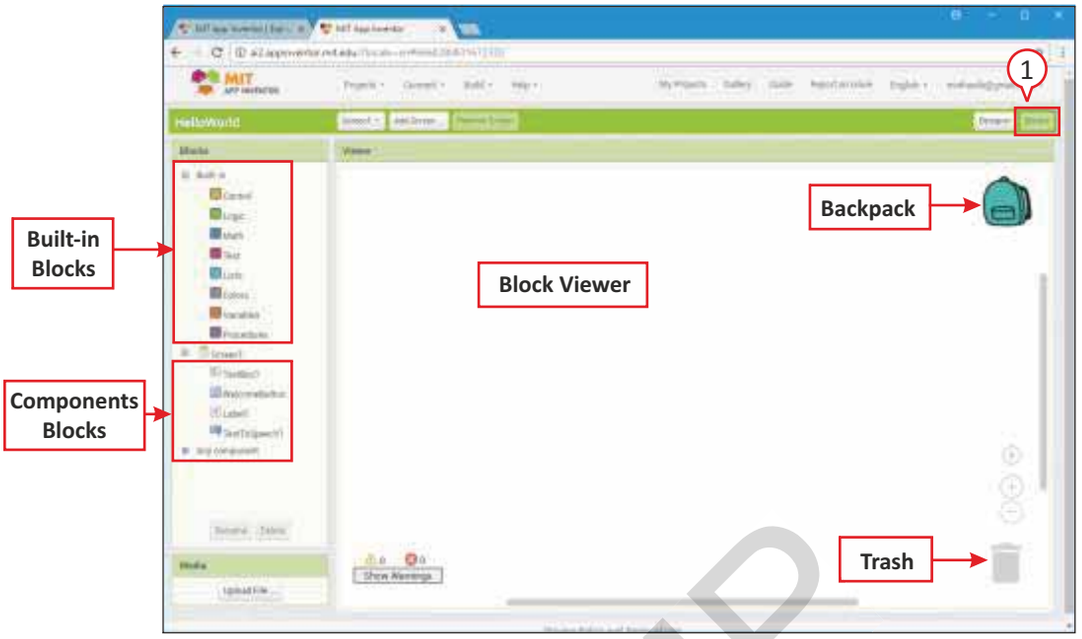
1. After downloading, installing and launching the software, click on **Connect** in App Inventor (in the browser).
2. Click on **Emulator**.

- After some time, depending upon the speed of your computer, the emulator appears on the screen showing **HelloWorld** app. Now whatever changes you will do in the App Inventor, those changes will also appear on the emulator.

Until now, both your connected mobile device and emulator can only show the app but cannot do any thing in it as we have not instructed it to do anything in the app. To allow every component you add in the **Component Designer** work, you have to move over to the **Blocks Editor**. In blocks editor, you create the code to make that component work according to you.

BLOCKS EDITOR

In the **Component Designer**, you have added TextBox, Button, Label, TextToSpeech and Image components as the building blocks for your first app. Now, let us make your app work when you tap the button. The Blocks Editor helps you do it by instructing the components what to do and when to do it.



1. Click on **Blocks**.

The App Inventor opens Block Editor window.

Main parts of Blocks Editor are given below:

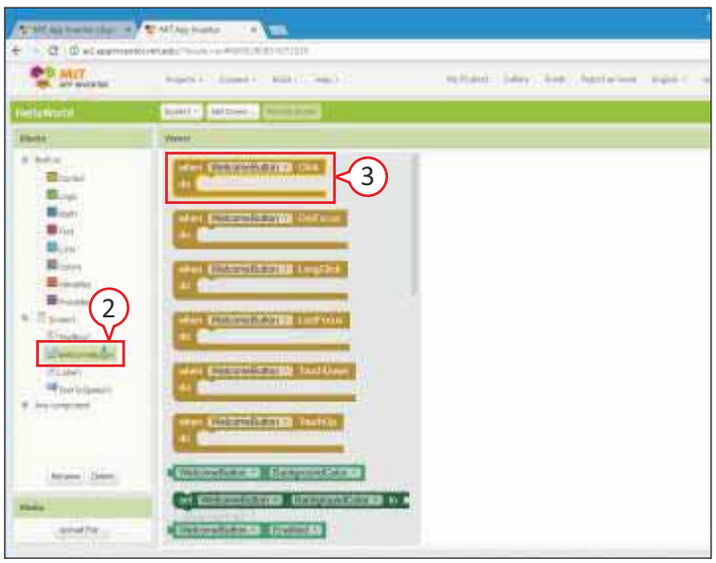
Built-in Blocks: These blocks are always available for you to use in your app.

Components Blocks: These are the blocks you have chosen for your app.

Block Viewer: This is the place where you assemble the blocks for your app.

Trash: It is used for deleting unwanted blocks.

Backpack: You can drag blocks into the Backpack icon so that you can use them later by dragging items out of the backpack and use them between the apps. Backpack retains a copy of your blocks even when you exit App Inventor.



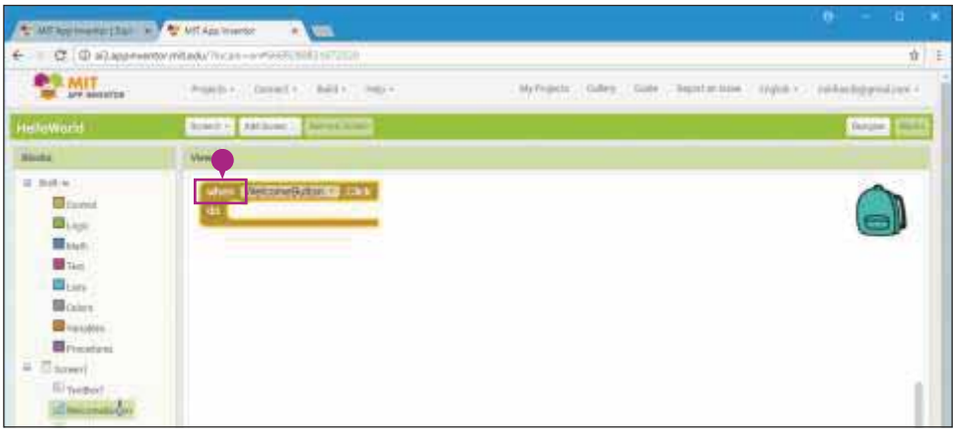
2. Click on **WelcomeButton** component.

A bunch of blocks related to your component appears in the viewer so that you can use them to build the behaviour of button.

3. Click on **when WelcomeButton.Click do** block.

Here block is showing WelcomeButton, because we have renamed the components from Button1 to WelcomeButton. Otherwise it will show 'when Button1.Click do'.

When you click on any block, only that block will remain in the viewer; all other blocks will disappear.



- You will notice that the word **when** is included on the block. Which means that this block will be launched **when** the button on your app is clicked. It is called an **Event Handler**.

4. Click on **Label1** component.

A bunch of blocks related to your components appears in the viewer.

5. Click on **set Label1.Text to** block.

This block instructs your app to display the text.

The selected block appears on the viewer.

6. Click on **set Label1.Text to** block again.
7. Drag this block and snap it into **when WelcomeButton.Click do** block.

8. Click on **Text** block in the Built-in area.

A bunch of blocks related to text component appears.

9. Click on **join** block.

10. Drag the join block and snap it into **set Label1.Text to** block.

Join block appends all of the inputs to make a single string.

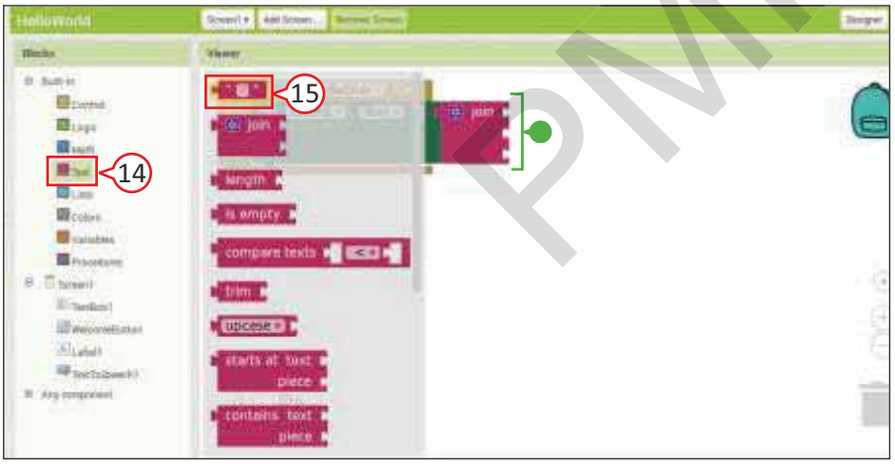
- By default, join block has two place folder to snap the blocks, but we need three for the app.

11. Click on the blue **setting** icon of join block.

*A pop-up balloon appears showing **two strings** in the join block. In this app, we need three strings.*

12. Click on the **string** block.
13. Drag and snap it under two strings in the join block.

Click anywhere to remove the popup balloon.



- You will notice that the join block now has **three** placeholders to snap the block.

14. Click on **Text** block in the Built-in area.
15. Click on **String** block.

The string block can contain characters.

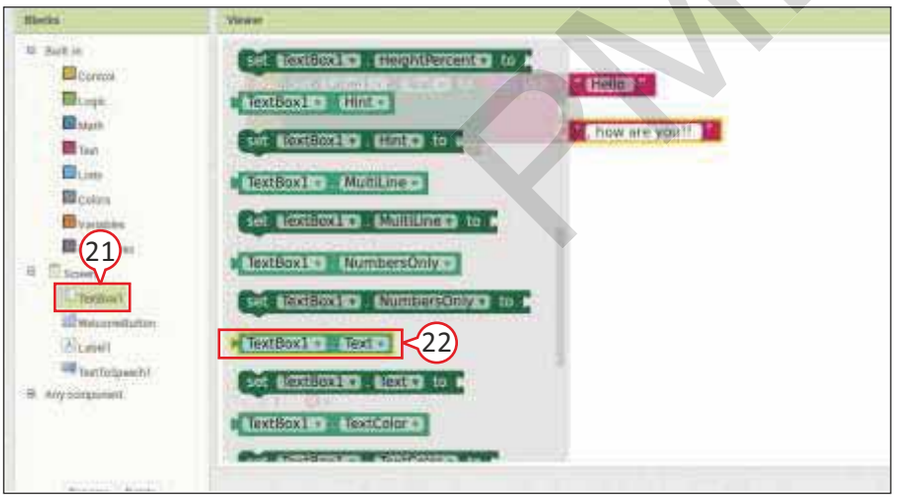
16. Drag and snap it in the first placeholder of join block.
17. Right-click on the String block. A menu appears.
18. Click on **Duplicate**.

A duplicate of String block appears.

19. Drag and snap it in the third placeholder of join block.

20. Type the text in both strings.

In this example, we have written **Hello** in first string block and, **how are you!!** in second string block.



21. Click on **TextBox1** component.

A bunch of blocks related to your components appears in the viewer. Now search for ***TextBox1.Text*** *block by scrolling down.*

22. Click on **TextBox1.Text** block.

This block lets the users enter text in a text box.

23. Drag and snap the selected block in the second placeholder of join block.

24. Click on **TextToSpeech1** component.

A bunch of blocks related to your components appears in the viewer.

25. Click on **call TextToSpeech1.Speak message** block.

TextToSpeech block will make the phone or device speak out the text.

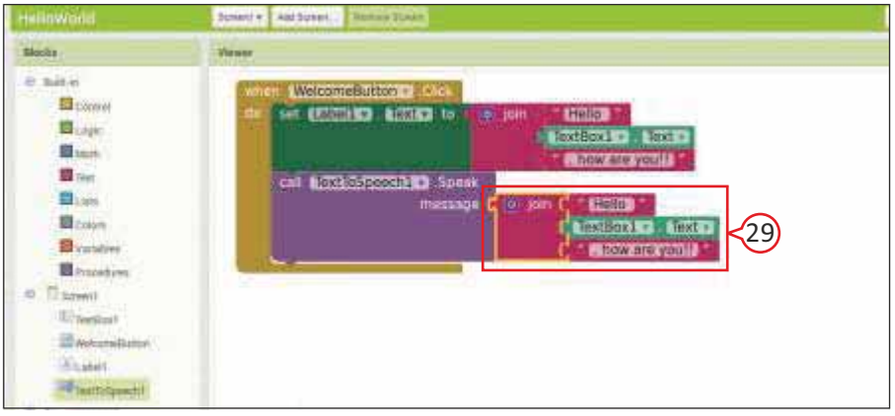
26. Drag and snap the selected block inside the **WelcomeButton** block under the **Label1** block.

As this block is inside the Button block, it will run when the button on your app is clicked.

27. **Right-click** on the **join** block. A menu appears.

28. Click on **Duplicate**.

A duplicate of join block with all three strings appears.



29. Drag and snap the join block in the **TextToSpeech** block.

Now, whatever is shown in the Label is audible in your mobile device.

RUNNING THE APP

After completing the app, you can run and test it in your connected Android device or emulator.

In this example, your device will show a **Text box**, **button** (Welcome) and an **image**.

When you write any text **(students)** in the Text box and press the button, the app will show a message **Hello students, how are you!!** and speak this message too.

EMULATOR

ANDROID DEVICE

1. Go to the connected Android device or emulator.

You have already learnt how to connect with Android device and emulator.

In the **emulator**, you will use **mouse** to click and work.

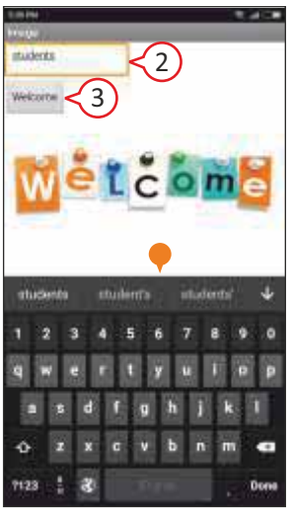
In the Android device, you will use your **finger** to tap and work.

2. Click or tap the **Textbox**.

- A virtual keyboard appears.

Type the **text (Students)**.

3. Click or tap the **Welcome** button.



After clicking or tapping the button, a message **Hello students, how are you!!** will appears along with its Sound.

Self-Evaluation

After reading the chapter, I know these points:

	CHECKLIST	
	Agree	Disagree
⊙ I know that an app consists of programs designed to make users more productive and/or assist them with personal tasks.	☐	☐
⊙ I know that apps are divided into three main types — Native app, Web App and Hybrid app.	☐	☐
⊙ I know that Apple's App Store and Google's Play Store contain many app categories as well as subcategories.	☐	☐
⊙ I know that MIT App Inventor is an open-source web application that lets us develop apps or applications for Android phones using a web browser.	☐	☐
⊙ I know that App Inventor programming environment has three key parts: Component Designer, Blocks Editor, Android Device or Emulator.	☐	☐
⊙ I know that Blocks Editor is used for instructing the components what to do and when to do it.	☐	☐

Exercises

A. Tick [✓] the correct answer.

1. iOS is developed and supported by ..... and can be used only on its own devices.
   a. Google ☐ b. Apple ☐ c. Android ☐
2. ..... apps are developed for a particular platform or iOS and Android devices.
   a. Web ☐ b. Hybrid ☐ c. Native ☐
3. ..... app helps the users improve their cognitive skills, such as attention and focus.
   a. Entertainment ☐ b. Gaming ☐ c. Utility ☐
4. In ..... window, the look and feel of our app is created.
   a. Blocks Editor ☐ b. Properties ☐ c. Component Designer ☐
5. ..... is used for instructing the components what to do and when to do it.
   a. Properties ☐ b. Blocks Editor ☐ c. Viewer ☐

B. Write 'T' for True and 'F' for False statements.

1. Web apps provide an experience similar to native apps. ☐
2. Hybrid apps are developed for a particular platform or device. ☐
3. To test our app on the emulator, we should click on Connect and then AI Companion. ☐
4. Block viewer is used for deleting unwanted blocks. ☐
5. Backpack retains a copy of our blocks even when we exit App Inventor. ☐

C. Fill in the blanks.

1. A ..... is optimized for display in a browser or on a mobile device.
2. ..... apps enables us to connect with people who share similar personal or professional interests.
3. ..... apps are used by everyone of us on a daily basis.
4. Any component that we place into the ..... from Components Palette, will also show up in Components list.
5. After creating, we can ..... our app in Android device or emulator.

D. Write the uses of the following.

1. Educational Apps: .....

   .....

2. Communication Apps: .....

   .....

E. Differentiate between the following.

Native App	Web App
.....	.....
.....	.....
.....	.....

F. Answer in 1-2 sentences.

1. What do you mean by app?

   .....

   .....

2. Name the different types of apps.

   .....

   .....

3. What is an App Store?

   .....

   .....

4. Name the areas of Component Designer window.

   .....

   .....

G. Answer briefly.

1. What do you mean by hybrid apps? Explain.

   .....

   .....

   .....

2. What is the use of MIT App Inventor?

.....

.....

.....

3. What is the purpose of Blocks Editor? Name its main parts.

.....

.....

.....

H. Application-based Question

Saanvi wants to wish 'Happy Birthday' to her best friend in a different way. One of her friends suggests to make an app in MIT App Inventor. She likes the suggestion and makes an app to say 'Happy Birthday' to her friend. Now, she wants to run the app but she does not know how to run it. Help her by telling the option for running it.

.....

Group Discussion

Divide the students into two groups and discuss the topic– 'Mobile Apps Make Our Life Easier or Insecure'.

Online Link

To learn more about app development, visit the website:

http://appinventor.mit.edu/explore/teach/example_projects

Discover More

Voice Command for Personal Assistant

Many mobile operating systems include a virtual personal assistant like **Google Assistant** in Android and **Siri** in Apple that processes voice commands and performs certain tasks. For example, you can issue a voice command to set an alarm, add an appointment, send a text message, or run an app. Given below are some of the voice commands.

TASK	SAMPLE VOICE COMMAND(S)
Change phone settings	"Turn on Wi-Fi." or "Turn off Bluetooth."
Dial a number	"Call Meenakshi's cell" or "Call Home" or "Dial 110088989."
Obtain information	"When was Mahatma Gandhi born?" "How many bits are there in a byte?"
Obtain driving instructions	"Navigate to Rajiv Chowk, New Delhi, India."
Perform a search	"How is the weather in Punjab?" "Search Dominos Pizza outlets in Delhi."
Run an app	"Run calculator."
Send a text message	"Text Akash to meet me in the office at 10:00 am."
Set a reminder	"Remind me to attend a workshop on Friday."
Set an alarm	"Set an alarm for 6:00 a.m. tomorrow."

Activity Section

Lab Activity

Create an app on computer parts and save it in 'Lab Activity' folder. Add a background image to the screen and six buttons, namely, Parts of Computer, Input Devices, Processing Device, Storage Devices, Output Devices and Back button. Whenever you click on any of the buttons, appropriate image should be opened with the spoken message regarding the topic.

Note: Your background images and spoken message may vary.

Skill Formation

This activity will

- enhance the creativity and coding skills of the students.

9 Python – Looping and Tkinter GUI

OBJECTIVES

After completing this chapter, you will be able to:

- Understand the concept of loop in programming.
- Identify the types and uses of loops.
- Understand the use of Break and Continue statement.
- Learn about Tkinter, its widgets and layout management.

In the previous class, we have learned about the conditional control structures (if, if-else, if-elf-else, nested if) in Python. Now in this chapter, we will learn about loops and Tkinter.

Loop

Nothing is more boring than having to do the same thing again and again. In programming, programmers do not particularly like repeating the same commands. Thankfully, most programming languages have loop option for that problem.

Loop causes a section of your program to be repeated a certain number of times. The repetition continues while a condition is true. When the condition becomes false, the loop ends, and the control passes to the statement following the loop. In looping, a sequence of statements is executed until some condition for the termination of the loop is satisfied. A program loop therefore consists of two segments, one known as **body of the loop** and the other known as the **control statement**. The control statement tests certain conditions and then directs the repeated execution of the statements contained in the body of the loop.

Let us take a real life example. We brush our teeth daily in up and down direction repeatedly until our teeth get cleaned up throughly. This process in a computer program qualifies as looping.

NEED OF LOOP IN PROGRAMMING

If you want to print "Python Loop" five times, normally you will code something like this:

```
File  Edit  Format  Run  Options  Window  Help
print("Python Loop")
print("Python Loop")
print("Python Loop")
print("Python Loop")
print("Python Loop")
```

Output in Interactive Mode

```
Python Loop
Python Loop
Python Loop
Python Loop
Python Loop
>>>
```

Now, suppose you have been asked to print this statement 500 times, what would you do? Writing the same code again and again would be more tedious and time-consuming. Here comes the loop as a saviour.

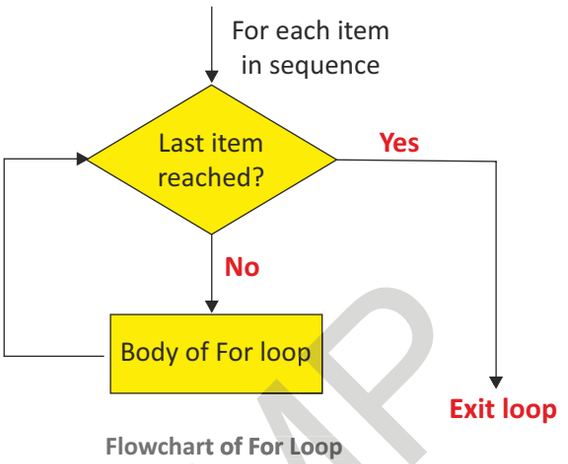
Types of Loops

There are two types of loop in Python.

1. **Counter Loop (For Loop)**
2. **Conditional Loop (While Loop)**

COUNTER LOOP (FOR LOOP)

The **for loop** is used to repeat a block of statements until there is no item in any sequence. This statement iterates over the items of any sequence (a list or a string), in the order that they appear in the sequence. Loop continues until we reach the last item in the sequence. The body of for loop is separated from the rest of the code using indentation.



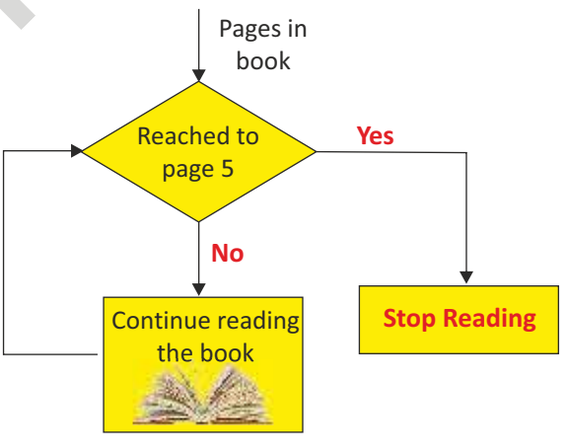
Flowchart of For Loop

Let us take a real life example.

Suppose your teacher asks you to read five pages from a book.

Here, the reading task is repetitive. So here we set this condition in loop, read the book until you reach up to the 5th page.

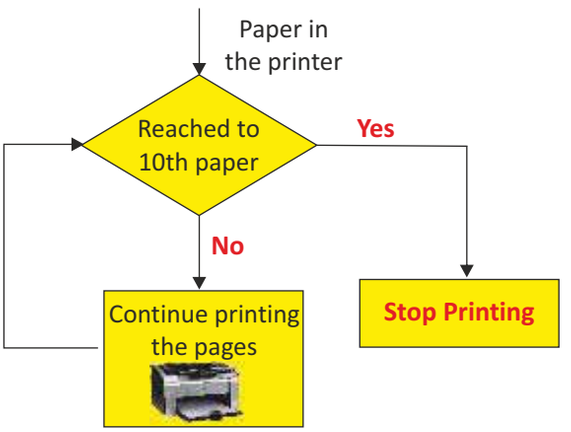
The process of reading would stop when you reach page number 6.



Let us take another real life example.

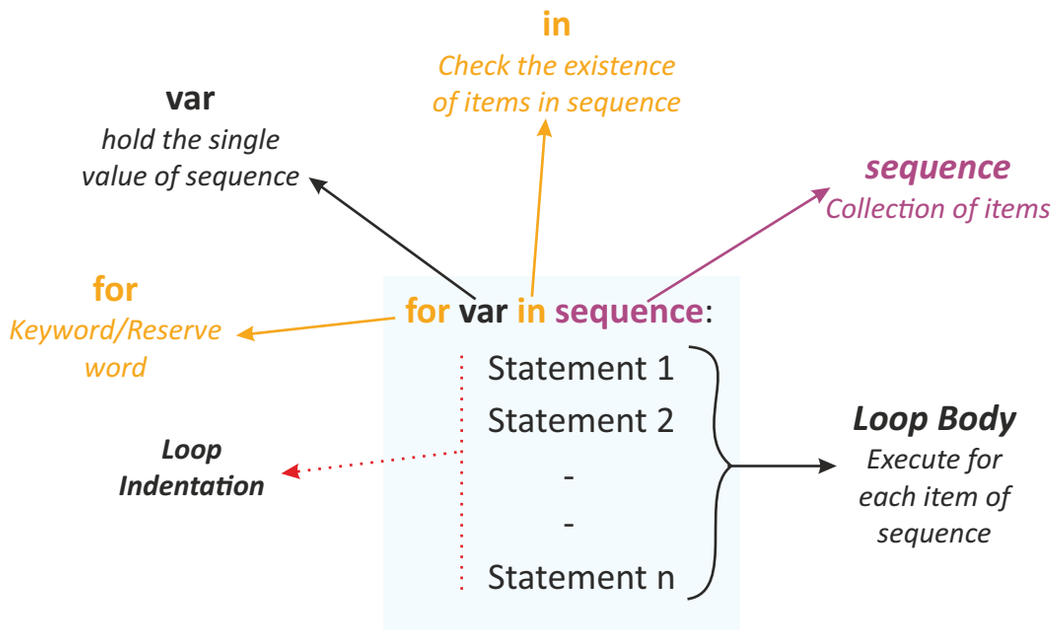
Suppose someone asks you to print ten pages from the printer. In this case, printing task is same for all ten pages.

So we set the condition in loop, print the pages till 10th paper is printed. As per condition, printer prints the page up to the 10th paper. When it reaches up to page 11, it will stop the printing.



For loop is used to print the sequential item till it reaches the last item or step.

Syntax:



Sequence: It is a collection of elements. String, list or tuple are termed as sequence.

In operator: It is used to check existence of value in a sequence. If it finds the value in a sequence, it evaluates **True**, otherwise **False**.

Program 1: Print all the letters of "codebot".

```
File  Edit  Format  Run  Options  Window  Help
for x in "codebot":
    print(x)
```

Output in Interactive Mode

```
c
o
d
e
b
o
t
>>>
```

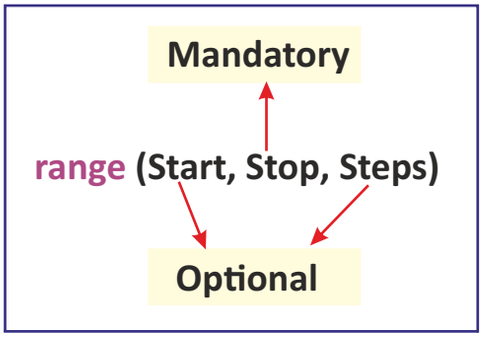
When the above program is executed, **x** variable holds the first letter of **codebot** and **In operator** will check the existence of letter in sequence (string). If it exists, the loop body will be executed and the first letter **c** will be printed.

Now second time when **x** holds the second letter of **codebot**, **In operator** will again check the existence of letter in sequence (string). If it is exists, the loop body will be executed and the second letter **o** will be printed. This process will continue to print the letters of the word **(**codebot**)** till **x** reaches up to the last letter.

Range ( )

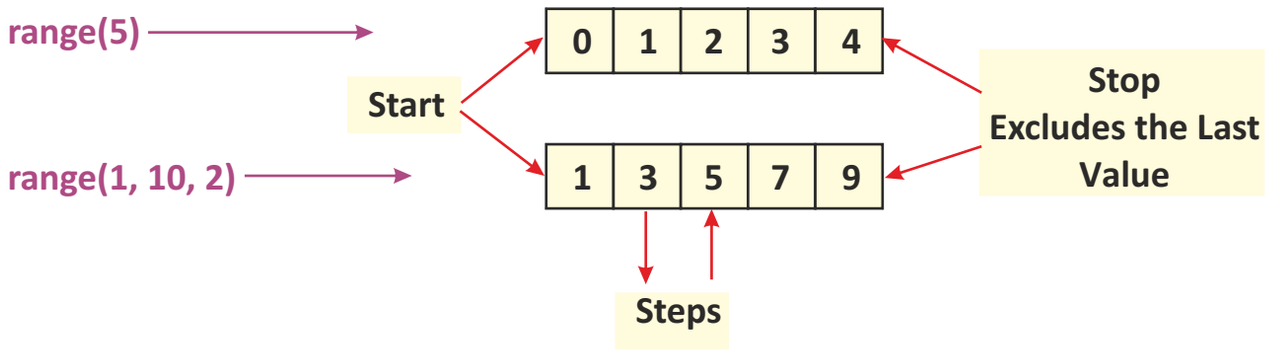
Range is a pre-defined function of Python. This function is used when we need to perform an action for a specific number of times. It returns the sequence of numbers. The range function consists of three parameters– **Start**, **Stop** and **Steps**. **Start** and **Stop** are optional and are used for specific cases but **Stop** parameter is mandatory as it is used to define the stopping point of the sequence.

Note: *Range function, by default, starts from value 0 and self incremented by value 1. It always includes the first value but excludes the last value.*



Structure of range function

Example:



Let us take the same example as discussed in the beginning.

```
File  Edit  Format  Run  Options  Window  Help
print("Python Loop")
print("Python Loop")
print("Python Loop")
print("Python Loop")
print("Python Loop")
```

Output in Interactive Mode

```
Python Loop
Python Loop
Python Loop
Python Loop
Python Loop
>>>
```

Let us create this program using the loop.

```
File  Edit  Format  Run  Options  Window  Help
for i in range(5):
    print("Python Loop")
```

Output in Interactive Mode

```
Python Loop
Python Loop
Python Loop
Python Loop
Python Loop
>>>
```

As you can see, normal coding style takes more time and space to type the repetitive code and it has more chance of error in writing the program.

Using the loop, you can see that the lines of code reduce. Due to the short code, it takes less time to type the code which saves overall time and also makes the program error-free. In both the cases, program shows the same output.

Program 1: Print all the numbers between 1 to 10.

```
File  Edit  Format  Run  Options  Window  Help
for num in range(1,11):
    print(num)
```

Output in Interactive Mode

```
1
2
3
4
5
6
7
8
9
10
>>>
```

In the above program, **range** function has two parameters **Start** = **1** and **Stop** = **11**. So, here every time step value by default would be incremented by 1 and values from **1** to **10** will get printed.

Note: *The parameters are like variables which are specifically defined for functions.*

Program 2: Print all odd numbers between 1 to 10.

```
File  Edit  Format  Run  Options  Window  Help
for num in range(1,10,2):
    print(num)
```

Output in Interactive Mode

```
1
3
5
7
9
>>>
```

In the above program, **range** function has given three parameters **Start** = **1**, **Stop** = **10** and **Steps** = **2**. So every time, step value is incremented by **2** and all the odd values from **1** to **10** get printed.

FOR-ELSE LOOP

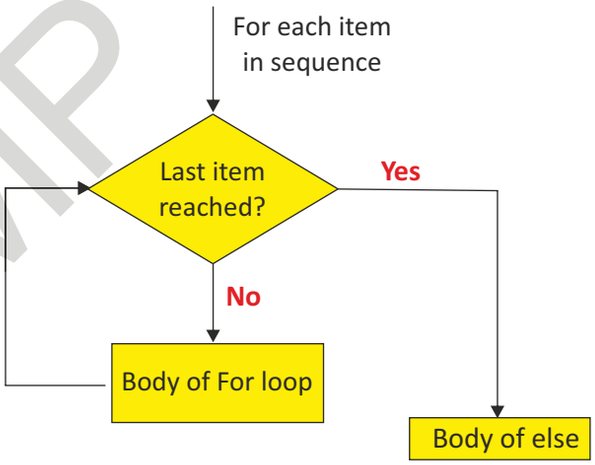
When we use **else** with **for loop**, this structure is known as **for-else loop**. The else clause of a loop gets executed only if the loop completes its execution normally without having encountered with break statement.

Syntax:

```
for var in sequence:
        Statement 1
        Statement 2
            -
            -
        Statement n
else:
        Statements
```

Loop Body

Else Body



Program 3: Print the message 'Printed Successfully' after printer prints five pages.

```
File  Edit  Format  Run  Options  Window  Help
for x in range(1,6):
    print("Printed Page ",x)

else:
    print("Printed successfully")
```

Output in Interactive Mode

```
Printed Page  1
Printed Page  2
Printed Page  3
Printed Page  4
Printed Page  5
Printed successfully
>>>
```

When the above program executes, the loop statement will execute five times. Once the range goes to 6, it will print the **else** statement.

Program 4: Print all the numbers from 5 to 10, and print a message when the loop has finished.

```
File  Edit  Format  Run  Options  Window  Help
for num in range(5,11):
    print(num)
else:
    print("Loop has finished")
```

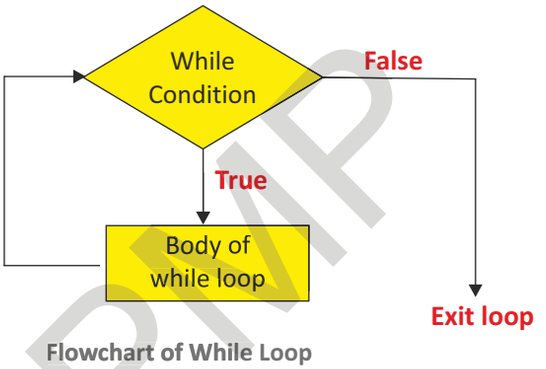
Output in Interactive Mode

```
5
6
7
8
9
10
Loop has finished
>>>
```

As you can see that when **for** loop reaches its last value, the **else** statement executes and prints the message **'Loop has finished'**.

CONDITIONAL LOOP (WHILE LOOP)

The **while** loop in Python is used to repeat a block of statements for given number of times until the given condition is false. It starts with the condition; if the condition is **True** then statements inside the while loop will be executed, otherwise if the given condition is **False** then it will not be executed for at least once. It means, while loop may execute zero or more time.

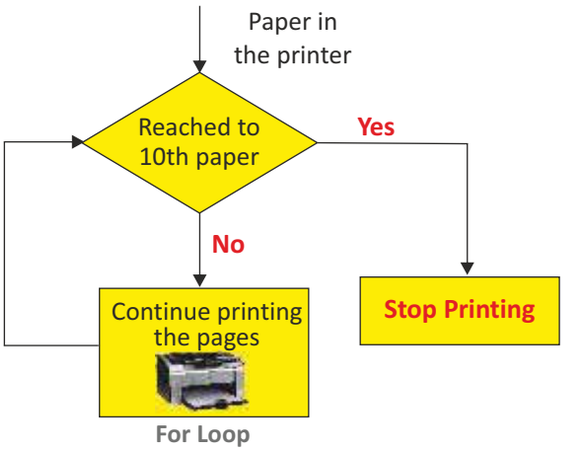


Flowchart of While Loop

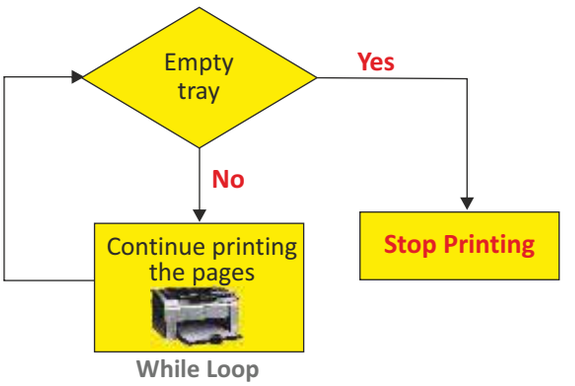
The above flowchart shows the executing process of **while** loop. First, while loop condition will be checked. If the given condition is **True**, it enters in the body of loop and executes all its statements. This process will repeat again and again until the condition evaluates to **False**.

Let us compare the previous For loop example with While loop.

Suppose someone asks you to print the pages from printer until the printer tray gets empty. In this case, we do not know the exact number of papers in tray, but we know a condition – till the tray will be empty. So, the printer checks the availability of pages every time whenever it begins to print. When paper is not available in tray, it would stop the printing.



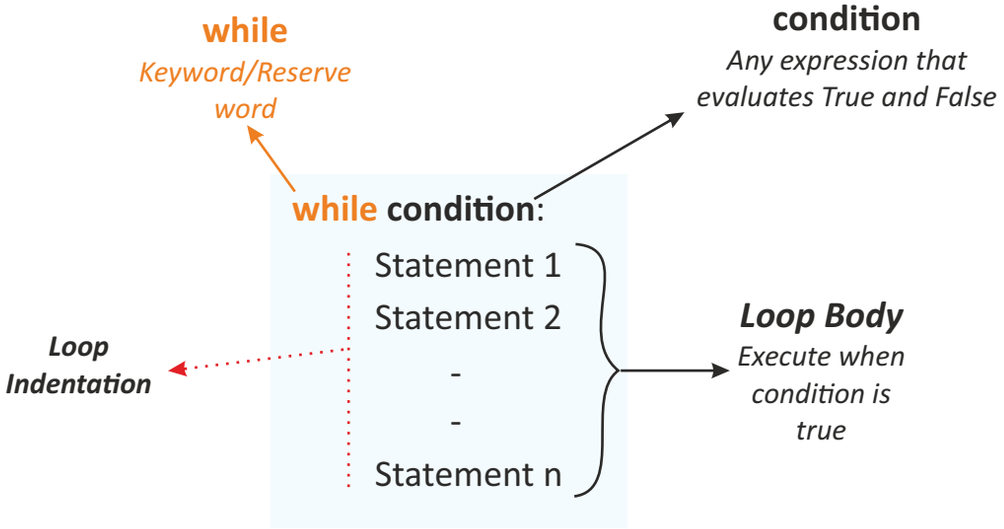
For Loop



While Loop

While loop is also known as **entry control loop**.

Syntax:



Program 5: Program to print the pages until the user enters 'no'.

```
File  Edit  Format  Run  Options  Window  Help
ans='yes'
while ans=='yes':
    print("Print the Pages ")
    ans=input("Do you want to print; Type yes/no : ")
```

Output in Interactive Mode

```
Print the Pages
Do you want to print; Type yes/no : yes
Print the Pages
Do you want to print; Type yes/no : yes
Print the Pages
Do you want to print; Type yes/no : no
>>>
```

In the above program, **ans** variable is initialized to **yes**, so loop condition is **True** and it will enter the loop and execute the statements. Next, if you type the word **yes**, the while condition will be **True** and again loop statements will be executed. This process executes the loop statements until user types the word '**no**'. Once the user types it, the loop gets terminated.

Program 6: Program to print the first five natural numbers.

```
File  Edit  Format  Run  Options  Window  Help
num=1
while num<=5:    #Condition
    print(num)
    num=num+1    #Increment value by 1
```

Output in Interactive Mode

```
1
2
3
4
5
>>>
```

In this program, **num** variable is initialized to value **1** so loop condition is **True** because **num <=5** and it will enter to the loop and print number **1**. Next the num will be incremented by 1. Again condition will be **True**, so it will enter the loop and print number **2**. This process executes the loop statements until the value of num exceeds **5**. Once num value will become greater than 5, the loop will be terminated.

Program 7: Print the even numbers between 1 to 10.

```
File  Edit  Format  Run  Options  Window  Help
num=2
while num<10:
    print(num)
    num=num+2
```

Output in Interactive Mode

```
2
4
6
8
>>>
```

In the above program, **num** variable is initialized to **2**, so loop condition (num<10) is **True** and it will enter to the loop and print number **2**. Next the num will be incremented by **2**. Again condition will be tested and evaluates to **True**, so it will enter the loop and print number **4**. This process will continue until num value becomes **equal to or greater than 10**. Once num value will become equal to or greater than 10, the loop will be terminated.

Program 8: Print the addition of series 1 + 2 + 3 + 4 + 5.

```
File  Edit  Format  Run  Options  Window  Help
num=1
add=0
while num<=5: #relational condition
    add=add+num
    num+=1

print("Addition of five values is : ",add)
```

Output in Interactive Mode

```
Addition of five values is :  15
>>>
>>>
```

In the above program, the variables **num** and **add** variables are initialized to **1** and **0**. The loop condition evaluates to **True** as **num <=5** and it will enter to the loop and store the value **1** in **add** variable. Next the value of num will be incremented by **1** and now set to **2**. The program's control moves to while loop and again the value of num is checked against condition, i.e. **num <5**, as it is still satisfying the condition. So it will lead to the execution of statements inside the loop body and the process would be repeated until the condition evaluates to **False** such as when the value of num exceeds **5**.

Program 9: Print all odd numbers between 1 to 15.

```
File  Edit  Format  Run  Options
odd=1
while odd<=15:
    print(odd)
    odd=odd+2
```

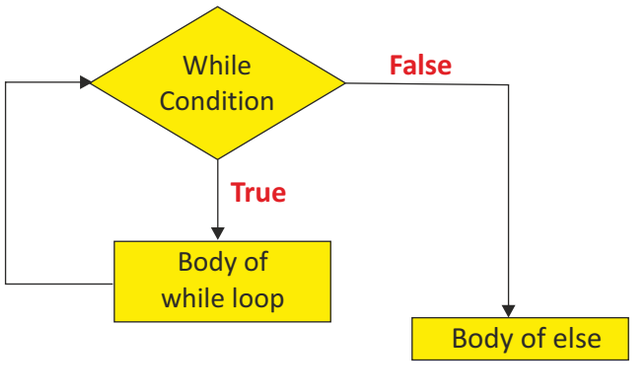
Output in Interactive Mode

```
1
3
5
7
9
11
13
15
>>>
```

WHILE-ELSE LOOP

When we use **else** with **while loop** this structure known as **while-else loop**. Using this loop, we can run an instruction code when the comparing value reaches to exceed limit of condition value.

```
while condition:
        Statement 1
        Statement 2
            -          → Loop Body
            -
        Statement n
else:
        Statements     → Else Body
```



Flowchart of while-else Loop

Program 10: Program to print the value of variable until it becomes less than 0.

```
File  Edit  Format  Run  Options  Window  Help
value=5
while value>=0:
    print(value)
    value=value-1
else:
    print("Now value is Negative")
```

Output in Interactive Mode

```
5
4
3
2
1
0
Now value is Negative
>>>
```

In the above program, **value** variable is initialized to **5**, so loop condition is **True** and it will enter the loop and print number **5**. Next, the value will be decremented by **1**. Again condition will be tested and evaluates to **True**, so it will enter to the loop and print number **4**. This process executes the loop statement until value becomes **less than 0**. Once value becomes less than 0, the loop gets terminated and **else** statement gets executed.

Program 11: Program to print "Python" five times and print "Stop" once the condition becomes false.

```
File  Edit  Format  Run  Options  Window  Help
i=1
while i<=5:
    print("Python")
    i=i+1
else:
    print("Stop")
```

Output in Interactive Mode

```
Python
Python
Python
Python
Python
Stop
>>>
```

In the above program, **i** variable is initialized to **1**, so loop condition is **True** and it will enter to the loop and print **Python**. Next, the **i** will be incremented by **1**. Again condition will be **True**, so it will enter the loop and print **Python**. This process executes the loop statements until **i** becomes **greater than 5**. Once value becomes greater than 5, the loop will be terminated and **else** statement will be executed.

Program 12: Print all quotients when the number is divided by 10 until it becomes less than zero.

```
File  Edit  Format  Run  Options  Window  Help
num=int(input("Enter any 3 digit number : "))
while num>0:
    print(num)
    num=num//10

else:
    print("Number is less than Zero")
```

Output in Interactive Mode

```
Enter any 3 digit number : 345
345
34
3
Number is less than Zero
>>>
```

In the above program, the user will input any three digit number which is assigned to **num** variable if the entered number is not **zero (0)**. The while loop first checks for condition, i.e. **num > 0**. If it evaluates to true then program control enters into **body of loop** and executes the statements. Next, the **num** will **divided by 10** and store **quotient**. This process will repeat until the value of **num** becomes **less than 0**. Once **num** becomes less than 0, the loop will terminate and **else** statement will be executed.

BREAK STATEMENT

Break statement can be used to unconditionally jump out of the loop. It terminates the execution of the loop. you can use it in **while loop** and **for loop**. Break is mostly required when, due to some external condition, we need to exit from a loop.

Program 13: Exit the loop when the num is equal to 5.

```
File  Edit  Format  Run  Options  Window  Help
for num in range(10):
    if num==5:
        break
    print(num)
```

Output in Interactive Mode

```
0
1
2
3
4
>>>
```

In the execution of the above program, the loop terminates when the value of **num** becomes 5.

CONTINUE STATEMENT

Continue statement is used to tell the program to skip the rest of the statements of the current iteration of loop block and move to next iteration of the loop. Loop does not terminate but continues on with the next iteration. This can also be used with both **while** and **for loop**.

Program 14: Print all the values from 1 to 5 except the value 2.

```
File  Edit  Format  Run  Options  Window  Help
for num in range(5):
    if num==2:
        continue
    print(num)
```

Output in Interactive Mode

```
0
1
3
4
>>>
```

Activity: Create both the programs 13 and 14 with the help of while loop.

Tkinter

Tkinter is the standard library in Python. It is used to create **Graphical User Interface (GUI)** in Python. Python has many GUI creation libraries; Tkinter is one of them. With the help of Tkinter, you can create Label, Entry, Frame, Buttons, etc. in Python IDLE.

IMPORTING TKINTER LIBRARY

As you know that Tkinter is the GUI library in Python, so we need to import it first to access its functions.

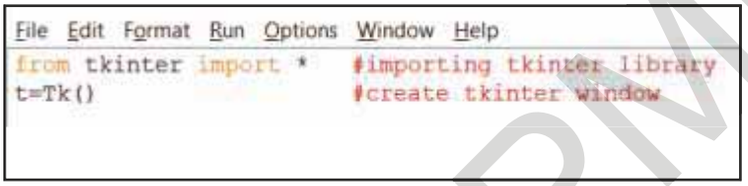
For importing Tkinter library, type the following code on **Python Interactive Mode**:

```
>>> from tkinter import *
>>>
```

Note: *While typing the code, remember the letter case, otherwise it will display an error.*

CREATING TKINTER WINDOW

After importing Tkinter library, you can create Tkinter GUI window. **Window** is the area where all the created widgets will display. All the widgets will be created under the Tkinter window. Follow the steps to create Tkinter window.



1. Open the **Python IDLE** in Script mode.
2. Type the given code.
3. **Save** the file and **Run** module.

The output of the above code will show the window filled with gray color with default title name ***tk****.*

TKINTER WIDGETS

Widget is a small part of Graphical User Interface which provides better controls for user. A user interacts with GUI using various controls like Label, Entry, Button, Radio Button, etc.

There are some widgets explained below.

Label( )

This widget is used to create single-line label or caption. It is used to give information to the user about the other widgets.

Syntax:

```
variable = Label(attribute1, attribute2....)
```

There are many attributes for the label widget like text, width, height, etc. Here we will cover only the text attribute.

```
File  Edit  Format  Run  Options  Window  Help
from tkinter import *
t = Tk()
l = Label(text="Full Name")
l.pack()
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
   - The starting letter of the widget name should be in capital.
3. **Save** the file and **Run** module.

*The output of the above code will show the **tk** window with label **Full Name**.*

You can write multiple attributes using comma separator.

***Note:** The method **pack()** has been explained in the next section.*

Entry( )

This widget is used to create single-line input box where user can input the data.

Syntax:

variable =Entry()

```
File  Edit  Format  Run  Options  Window  Help
from tkinter import *
t = Tk()
l = Label(text="Full Name")
l.pack()
e = Entry()
e.pack()
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
   - Always remember the sequencing of **pack()** method.
3. **Save** the file and **Run** module.

*The output of the above code will show a window along with the label **Full Name** and an **Entry Box**.* You can enter text in this box.

Button( )

This widget is used to create action button for application. Button displays text or image to specify the objective of the button. User can attach any file and function with it.

Syntax:

variable =Button(attribute1, attribute2….)

```
File  Edit  Format  Run  Options  Window  Help
from tkinter import *
t = Tk()
b = Button(text="Submit")
b.pack()
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
3. **Save** the file and **Run** module.

*The output of the above code will show a window along with a button labelled **Submit**.*

Radiobutton( )

This widget is used to create one option out of many selections. The user is provided with multiple choices out of which only one can be selected.

Syntax:

```
variable = Radiobutton(attribute1, attribute2.... )
```

```
File Edit Format Run Options Window Help
from tkinter import *
t = Tk()
r1=Radiobutton(text="Male")
r1.pack()
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
3. **Save** the file and **Run** module.

*The output of the above code will show a window along with one radio button **(Male)**.*

Checkbutton( )

This widget is used to create multi-selection check boxes. User can select one or multiple check boxes from the list.

Syntax:

```
variable = Checkbutton(attribute1, attribute2.... )
```

```
File Edit Format Run Options Window Help
from tkinter import *
t = Tk()
c= Checkbutton(text="I Agree")
c.pack()
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
3. **Save** the file and **Run** module.

*The output of the above code will show a window along with a checkbox button (**I Agree**).*

TKINTER LAYOUT MANAGEMENT

Tkinter uses some specific methods to organize the widgets in window area. These methods are collectively termed as **Layout Management Method**.

Tkinter has three types of layout management methods: **Pack**, **Grid** and **Place**.

Pack( )

This layout method organizes the widget as block in the window based on pack such as left, right, top and bottom. This method is used to control the position of application using various options such as expand, fill and size. By default, pack() method sets the widget at the top side.

Let us learn to use **side** option of **pack()** method. The **side** option represents the position of widget, such as left, right, top or bottom.

Syntax:

```
widget.pack(side = side_name)
```

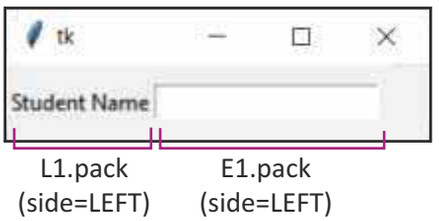
Here, **side** is an **option** and **side_name** is a **value** (left, right, top or bottom).

```
File  Edit  Format  Run  Options  Window  Help
from tkinter import *
t=Tk()

L1=Label(text="Student Name")
L1.pack(side=LEFT) #left Side

E1=Entry()
E1.pack(side=LEFT)
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
   - **Side_name** should be in capital letters.
3. **Save** the file and **Run** module.



The output of the above code sets the Label and Entry widgets in Tkinter window based on given side.

Grid( )

This layout method organizes the widgets of window in tabular form. Grid takes the row and column value and organizes the widgets based on it.

Syntax:

```
widget.grid(row = Row_Number, column=Column_Number)
```

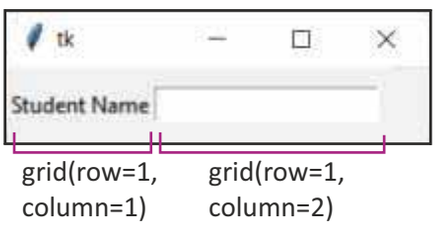
Note: *Row_Number and Column_Number are always displayed in integer like 0, 1, 2…..*

```
File  Edit  Format  Run  Options  Window  Help
from tkinter import *
t=Tk()

L1=Label(text="Student Name")
L1.grid(row=1, column=1) #row and column values

E1=Entry()
E1.grid(row=1, column=2)
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
3. **Save** the file and **Run** module.



The output of the above code sets the Label and Entry widgets in Tkinter window based on row and column values.

Place( )

This layout method organizes the widgets by placing them in coordinate-based pixel positions in window. It takes position value of X and Y coordinates and arranges the widgets according to it.

Syntax:

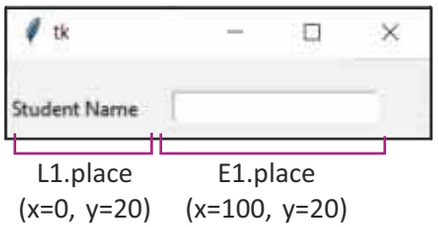
widget.place(x = xvalue, y = yvalue)

```
File Edit Format Run Options Window Help
from tkinter import *
t=Tk()

L1=Label(text="Student Name")
L1.place(x=0, y=20)      #x and y values

E1=Entry()
E1.place(x=100, y=20)
```

1. Open the **Python IDLE** in Script mode.
2. Type the given code.
3. **Save** the file and **Run** module.



The output of the above code sets the Label and Entry widgets in Tkinter window based on X and Y values.

Subject Integration

Mathematics

This integration will make the students learn to use mathematical operations in coding.

PRACTICE PROGRAMS

Program 1: Print the pattern using for loop.

```
File Edit Format Run Options Window
print("--Pattern--")
for num in range(5):
    print("* * * * * *").
```

Output in Interactive Mode

```
--Pattern--
* * * * * *
* * * * * *
* * * * * *
* * * * * *
* * * * * *
>>>
```

Program 2: Print the numbers from 5 to 10 and their addition using for-else loop.

```
File Edit Format Run Options Window Help
add=0
print("Number are : ")
for x in range(5,11):
    print(x)
    add=add+x
else:
    print("Addition is : ",add)
```

Output in Interactive Mode

```
Number are :
5
6
7
8
9
10
Addition is :  45
>>>
```

Program 3: Print the total even numbers from 1 to 50 using for loop.

```
File  Edit  Format  Run  Options  Window  Help
count=0
for x in range(2,50,2):
    count=count+1

print("Total even numbers are  :", count)
```

Output in Interactive Mode

```
Total even numbers are  : 24
>>>
```

Program 4: Print the table of any number using while loop.

```
File  Edit  Format  Run  Options  Window  Help
num=int(input("Enter Number for Table: "))
tab=1
i=1
while i<=10:
    tab=num*i
    print(num,"x",i,"=",tab)
    i=i+1
```

Output in Interactive Mode

```
Enter Number for Table: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
>>>
```

Program 5: Print the series 1 x 2 x 3 x 4 x 5... N and their product using while loop.

```
File  Edit  Format  Run  Options  Window  Help
n=int(input("Enter the N value: "))
mul=1
i=1
while i<=n:
    print(i)
    mul=mul*i
    i=i+1

print("Product is :", mul)
```

Output in Interactive Mode

```
Enter the N value: 5
1
2
3
4
5
Product is : 120
>>>
```

Program 6: Reverse any number using while loop.

```
File  Edit  Format  Run  Options  Window  Help
num=int(input("Enter the number :"))
rev=rem=0
while num>0:
    rem=num%10
    rev=(rev*10)+rem
    num=num//10

print("Reverse is  :", rev)
```

Output in Interactive Mode

```
Enter the number :123456
Reverse is  : 654321
>>>
>>>
```

Program 7: Enter any number and print the sum of all its digits using while-else loop.

```
File  Edit  Format  Run  Options  Window  Help
num=int(input("Enter any Number :"))
rem=sum=0
while num>0:
    rem=num%10
    sum=sum+rem
    num=num//10
else:
    print("sum of all its digits :", sum)
```

Output in Interactive Mode

```
Enter any Number :321
sum of all its digits : 6
>>>
```

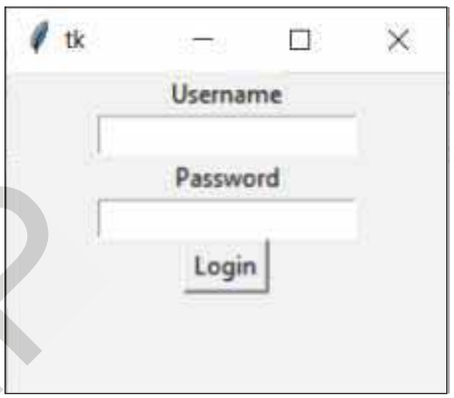
Program 8: Create a login form using Tkinter Label, Entry and Button widgets with pack method of Tkinter library.

```
File  Edit  Format  Run  Options  Window  Help
from tkinter import *
t=Tk()

L1=Label(text="Username")
L1.pack()
E1=Entry()
E1.pack()

L2=Label(text="Password")
L2.pack()
E2=Entry()
E2.pack()

B1=Button(text="Login")
B1.pack()
```



Self-Evaluation

CHECKLIST

After reading the chapter, I know these points:

	Agree	Disagree
I know that for loop is used to repeat a block of statements until there are no items in any sequence.	☐	☐
I know that range() function consists of three parameters – Start, Stop and Steps.	☐	☐
I know that while loop is used to repeat a block of statements for given number of times.	☐	☐
I know that Break statement is used to unconditionally jump out of the loop.	☐	☐
I know that Continue statement tells the program to skip the rest of the statements of current iteration of loop block and move to the next iteration of loop.	☐	☐
I know that Tkinter is the standard library in Python used to create GUI application.	☐	☐
I know that widget is the small part of GUI which provides better control for user.	☐	☐

Exercises

A. Tick [✓] the correct answer.

1. Which of the following is not the type of loop?

   a. Conditional ☐ b. Counter ☐ c. Compute ☐

2. String, list or tuple are termed as ..... .

   a. sequence ☐ b. function ☐ c. loop ☐

3. The while loop is also known as ..... control loop.

   a. empty ☐ b. entry ☐ c. exit ☐

4. ..... statement can be used to unconditionally jump out of the loop.

   a. Break ☐ b. Continue ☐ c. While-else ☐

5. ..... is the smaller part of GUI which provides better control to the user.

   a. Widget ☐ b. Range ☐ c. Continue ☐

B. Write 'T' for True and 'F' for False statements.

1. Sequence is a collection of elements. ☐
2. In operator is used to check existence of value in a sequence. ☐
3. When we use else with for, this structure is known as while-else loop. ☐
4. Range is a pre-defined function of Python. ☐
5. Continue statement is used to unconditionally jump out of the loop. ☐
6. Entry() widget is used to create single line input box. ☐

C. Fill in the blanks.

1. The ..... loop is used to repeat a block of statements until there is no item in any sequence.
2. The range function consists of three parameters — ....., ... and ..... .
3. When we use else with for loop, this structure known as ..... .
4. The ..... loop in Python is used to repeat a block of statements for given number of times until the given condition is false.
5. ..... widget is used to create action button for application.
6. ..... method organizes the widget window in tabular form.

D. Differentiate between the following.

1. While-else loop

   .....

   .....

   .....

   For-else loop

   .....

   .....

   .....

2. Radiobutton() Checkbutton()

.....

.....

.....

.....

.....

.....

E. Answer in 1-2 sentences.

1. What are loops and why are they important in Python program?

.....

.....

2. Define range() function.

.....

.....

3. Name three types of Tkinter layout management methods.

.....

.....

F. Answer briefly.

1. Explain for-loop with example.

.....

.....

.....

2. Explain Break statement and Continue statement with examples.

.....

.....

.....

3. What is widget? Give example.

.....

.....

.....

G. Application-based Question

Your teacher has asked you to write a program in which she wants the statement by which the program jumps out of the loop unconditionally. By which statement can you do so?

.....

Group Discussion

Divide the students into two groups and discuss on the topic — "Best Loop for Programming – For Loop or While Loop".

Online Link

To learn more about looping in Python, visit the website:

https://beginnersbook.com/2018/01/python-for-loop/

Activity Section

Lab Activity

Skill Formation
This activity will enhance the critical thinking skills of the students.

A. Write how many times the loop will execute and what output the following programs will show.

1.
```
for x in range(10):
    print(x)
```

2.
```
a=5
while a!=0:
    print("Run this code")
    a=a-1
```

B. Find the output of the following programs.

Skill Formation
This activity will make the students create GUI interface and enhance their coding skills.

1.
File Edit Format Run Options Window
```
for x in range(6):
    print("@#######@")
    print("@   ##   @")
```

2.
File Edit Format Run Options
```
i=0
while i<=10:
    if i==6:
        break
    print(i)
    i=i+2
```

3.
File Edit Format Run Options Window Help
```
from tkinter import *
t=Tk()

L1=Label(text="User ID")
L1.pack(side=LEFT)
E1=Entry()
E1.pack(side=LEFT)

L2=Label(text="Password")
L2.pack(side=LEFT)
E2=Entry()
E2.pack(side=LEFT)

B1=Button(text="Sign In")
B1.pack(side=LEFT)
```

10 Future Possibilities of AI

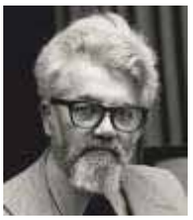
OBJECTIVES

After completing this chapter, you will be able to:

- Learn about the evolution of AI.
- Understand the future prospect of AI in various fields.
- Understand the specific skill set required for future AI careers.
- Learn about the ethical concerns related to the implications of AI.

Evolution of Artificial Intelligence

In the past few years, AI has evolved into a powerful tool that enables specific machines to think and act like humans. The term 'Artificial Intelligence' was coined by John McCarthy at an academic conference he organized in Dartmouth College in 1956 to discuss the subject. He is widely considered as the **Father of Artificial Intelligence** for his pioneer role within the field. Let us learn more about the timeline of innovations and advancements in AI.



John McCarthy

Year	Innovation
1950:	Artificial Intelligence was first conceptualized by Alan Turing to evaluate the intelligence level of machines.
1956:	**John McCarthy** coined the term 'Artificial Intelligence' at Dartmouth Conference.
1964:	A dissertation at MIT took place which showed that computers can understand natural language well enough to solve algebra word problems correctly.
1969:	**Shakey**, a robot, equipped with locomotion, perception, and problem-solving ability was built at Stanford Research Institute.
1973:	A Scottish robot named **Freddy** was built at Edinburgh University which was capable of using vision to locate and assemble models.
1979:	**Stanford Cart**, the first computer-controlled autonomous vehicle, was built.
1997:	Chess playing computer **Deep Blue** developed by **IBM** won against chess world champion **Garry Kasparov**.
2011:	Apple introduced a personal voice assistant **Siri** as a built-in feature for their devices. Super computer **IBM Watson** won against two human contestants in the television quiz show **Jeopardy**!.
2012:	Google's autonomous car passed the first US self-driving car test.
2014:	Amazon launched **Alexa** – an intelligent virtual assistant.
2017:	Google's AI **AlphaGo** beat world champion **Ke Jie** in the board game **Go.**
2018:	**Erica**, a robot, became a news anchor in Japan.
2019:	A gender-neutral voice assistant named **Q** was created.
2020:	Evolution of chatbots to conversational AI bots book place.

FUTURE POSSIBILITIES OF ARTIFICIAL INTELLIGENCE IN VARIOUS FIELDS

We are only at the beginning of AI development. Even then, we are already able to use some apps and devices based on AI. For instance, several voice assistants based on AI technology like Siri, Alice and Microsoft Cortana are found in our devices. The possibilities of AI in various fields are as follows:

a. **AI in Military:** AI provides simulation and training applications to the soldiers which give them a real-time virtual experience of the troubles and problems faced during military operations.

b. **AI in Research:** AI technology plays an important role in the research field because it provides an easy way for scientists to perform various types of experiments in a safe, effective and efficient way.

c. **AI in Healthcare:** The vision of AI technology is vast in the healthcare industry as it aims to improve the quality of life and save people. With the help of AI, doctors can easily analyze X-rays or scans of patients, choose appropriate treatment and give better consultation to the patients.

d. **AI in Entertainment:** AI technology is widely used in the entertainment industry for predicting the taste and preferences of viewers. The various OTT platforms or online music platforms use AI for marketing or trading aspects that include advertising, design, and film promotion.

e. **AI in Coding:** AI technology plays an important role in programming because it enhances the productivity of programmers by suggesting appropriate code syntax at the time of programming. Many programming languages, like Python, have AI-enabled tools which can easily detect bugs while coding.

f. **AI in Transportation/Serveillance:** AI-based applications coupled with cameras installed at the traffic junction aid in identifying the vehicle by detecting and extracting the license plate number; match it with the RTO database; generate an electric challan (e-challan); and send it via mail to the owner of the vehicle.

The place where AI may have the biggest impact in the near future is self-driving vehicles. Many companies like Tesla and Uber are developing autonomous vehicles which will rely heavily on AI to operate automatically and optimally.

In simple words, Artificial Intelligence is very important in the lives of human beings as it will affect the majority of people's activities and professions.

FUTURE AI CAREERS WITH SPECIFIC SKILL SET

You know that specific skills are needed to pursue a career in the development of AI field. Now, we are going to learn about some of the jobs available in AI along with the required skill set.

1. **Data Scientist:** Data scientists are the professionals who make value out of data. They fetch information from large data sets and analyze it for better understanding. The skill sets needed for this job are as follows:
   - Adequate knowledge of Big Data platforms like Hive, MapReduce, etc.
   - Knowledge of modern and statistical programming languages
   - Strong analytical skills
2. **Machine Learning Engineer:** Machine learning engineer is one of the most prominent professions in the field of AI. These engineers are responsible to develop and manage machine learning AI systems. The skill sets required to pursue a career in this field are:
   - Good knowledge of programming languages
   - Good knowledge of data science
   - Strong mathematical skills
3. **Business Intelligence Developer:** Business intelligence developer is also one of the most sought-after careers these days. They are responsible to analyze data for the prediction of present and future market trends. The specific skill sets required for these jobs are:
   - Good knowledge of query tools
   - Knowledge of data modelling and data mining
   - Ability to translate business requirements into technical requirements

Ethical Concerns Related to Implications of AI

AI systems have been raising serious ethical issues all over the world. These issues exist in two forms: **Data for AI systems** and **Implications of AI systems**. We have already discussed the ethical concerns of AI related to data in the previous class. In this class, we will learn about the ethical issues related to the implications of AI systems. These issues can be divided into two categories:

1. **Privacy Concern:** Data collection is one of the most serious implications of AI systems that comes under the category of privacy concern. Let us understand it with the help of an example. **Gmail**, an app of **Google**, helps us to set up an e-mail account for sending e-mails across the world. While creating an account on Gmail, you must have been asked to submit some personal information like your date of birth, phone number, etc. After filling all the information, you are asked to put a **tick mark** in the checkbox of a lengthy **User Agreement**, which most users accept without even realizing the implications of such agreements on our privacy rights. You should remember that the data entered by you is stored somewhere in the large databases. Thus, the information entered by you can be used in any manner wherein the potential risk is incredibly high.

2. **Adoption Concern:** One of the major concerns related to the adoption of AI systems is its impact on employment and the workforce. Let us understand more about adoption concern of AI system through the following points.

a) **Future of Jobs:** Nowadays, there has been notable concern regarding **loss of jobs** in future due to the adoption of AI-enabled systems in various sectors. Different researches on this topic have been published by different organizations, as given below:

*According to **AI Expert** Kai-Fu Lee, Chairman and CEO of Sinovation Ventures and author of the book 'AI Superpowers', "50% of all jobs will be automated by AI within 15 years."*

According to Oxford Economics, "Due to adoption of automated robots, up to 20 million jobs in the manufacturing sector across the world will be lost by 2030."

Thus, job loss is the major concern across the world due to increasing adoption of automated systems in various sectors.

b) **Security:** Like other technologies, AI systems can be used for both constructive as well as destructive purposes. On the bad side, bots can be used by fraudsters to perform automated logins with the goal of compromising user accounts. These systems can also be misused by cyber criminals for hacking data and causing potential damage.

It is a well-known fact that every coin has two sides. Similarly, the use of AI systems can be beneficial as well as destructive. To reduce the risk of any type of potential destruction, all organizations must follows the rules and regulations concerning the use and application of AI systems, so that we could leverage AI optimally.

AI Lab

Skill Formation

This activity enhances the data analysing skills of the students.

PIXEL IT (BASED ON LEARNING APPROACH)

You have already learnt how AI is used in transportation for creating e-challans. Now let us learn how AI system classifies the text, image, etc. and how it reads them. Every image which is being fed to the computer is divided into **pixels**. Each pixel only displays one color, so computers combine thousands of pixels in a grid in order to display complex images. This activity is based on a machine learning approach that is typically used in **'Computer Vision'** application.

***Note:** Machine learning and computer vision has already been discussed in previous classes.*

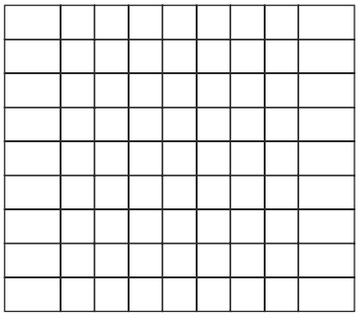


Figure 1

Step 1: Take three paper sheets and draw a table of 9 columns by 9 rows on each paper, as shown in figure 1. (You can also use graph paper or kids' Math notebook sheet.)

Step 2: Put the column values as shown in figure 2.

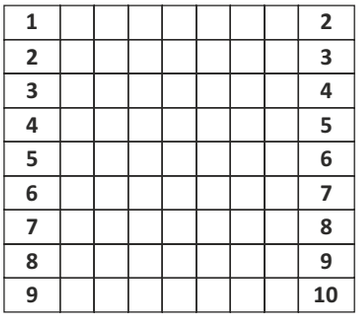


Figure 2

Step 3: Draw the letter 'R' on one of the papers randomly as shown in figure 3. (Touch all the possible edges.)

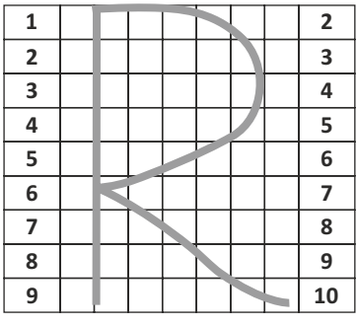


Figure 3

Step 4: Fill each corresponding cell of the letter with red marker or color as shown in figure 4.

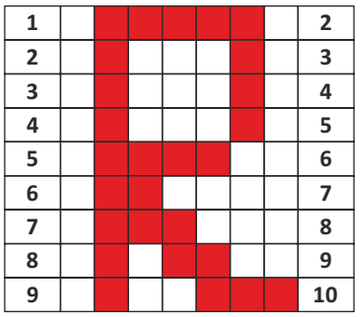


Figure 4

Step 5: Cut the strips of the paper as shown in figure 5.

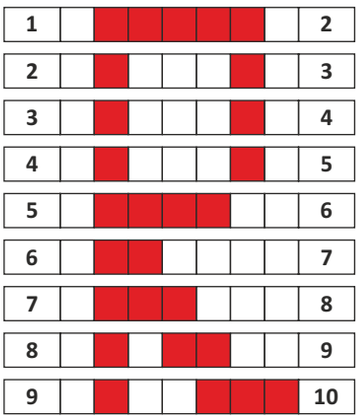
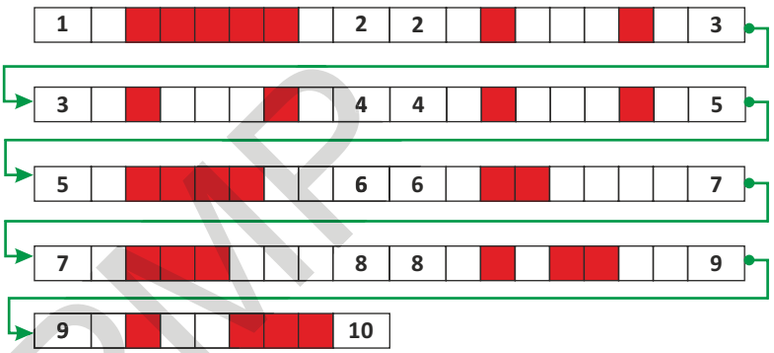
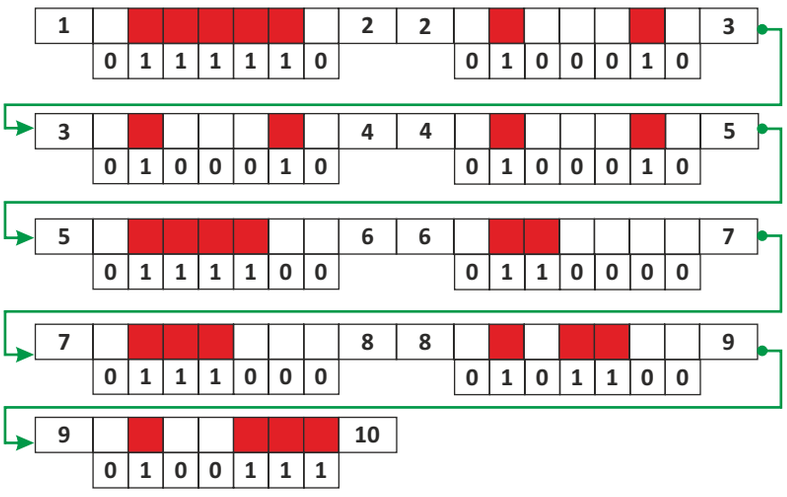


Figure 5

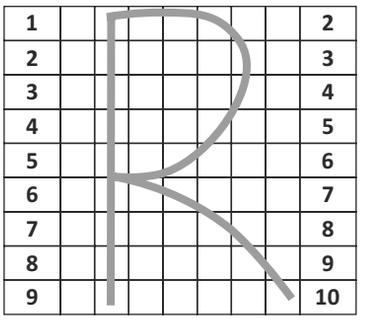
Step 6: Arrange all the cut strips one-by-one in order as shown.

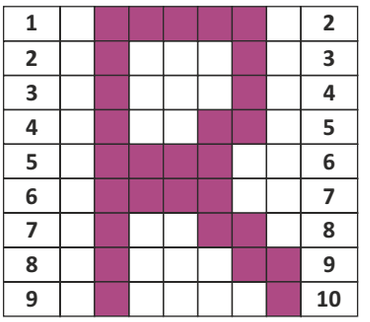


Step 7: Take the value '1' of the box or cell color which is red and '0' where the box or cell color is empty as shown.

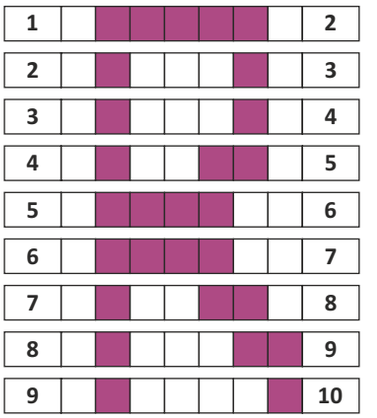


Step 8: Take the second paper and draw the letter 'R' again randomly as done in steps 3 and 4, as shown in the figure. (You can take any color to fill the cells or boxes.)

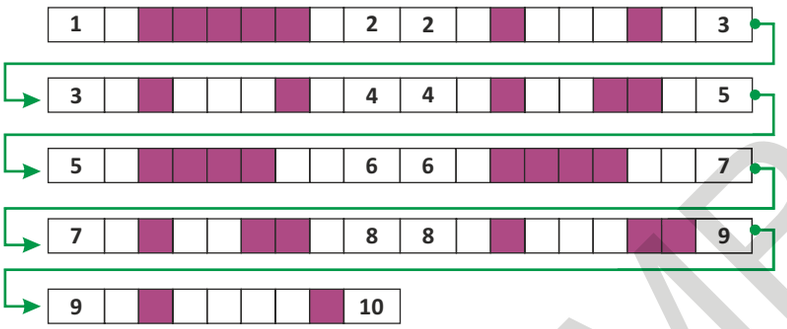




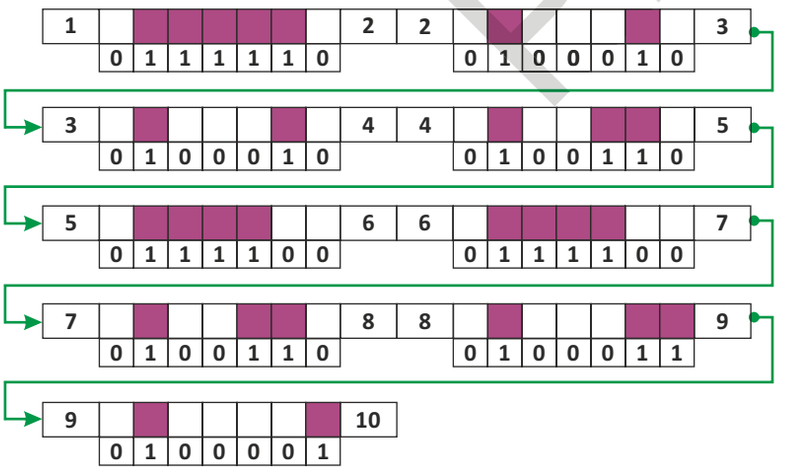
Step 9: Cut the strips as done previously in step 5.



Step 10: Arrange the strips as done in step 6.



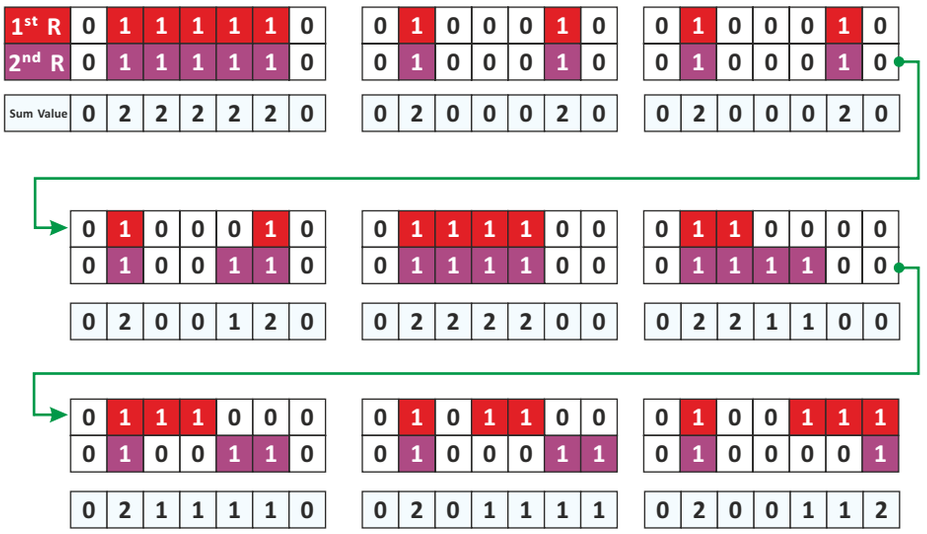
Step 11: Take values 1 or 0 as done in step 7.



Do You Know?

- The images saved in the computer are divided into pixels.
- Machine learning also uses the same approach for its applications.
- The computer analyses each pixel; whenever any comparison is required, it compares these pixels. If pixels are identical, this means that the images are the same.

Step 12: Now take both letters' values and add them in a sequence as shown.



Step 13: Now take the sum value of the first and second letter and place its value in table cells on the third paper as shown in figure.

1	0	2	2	2	2	2	0	2
2	0	2	0	0	0	2	0	3
3	0	2	0	0	0	2	0	4
4	0	2	0	0	1	2	0	5
5	0	2	2	2	2	0	0	6
6	0	2	2	1	1	0	0	7
7	0	2	1	1	1	1	0	8
8	0	2	0	1	1	1	1	9
9	0	2	0	0	1	1	2	10

Step 14: Fill any color where the table cell values have '1' or '2' and leave those cells empty whose value is '0' as shown in figure.

1	0	2	2	2	2	2	0	2
2	0	2	0	0	0	2	0	3
3	0	2	0	0	0	2	0	4
4	0	2	0	0	1	2	0	5
5	0	2	2	2	2	0	0	6
6	0	2	2	1	1	0	0	7
7	0	2	1	1	1	1	0	8
8	0	2	0	1	1	1	1	9
9	0	2	0	0	1	1	2	10

You have created an intelligent model which can recognize whether an alphabet you wrote is similar to the data you entered previously or not. Also, train the model with the data sets of the same alphabet that you used in the above activity but take different shapes of boxes. The model would see if the colored blocks are aligned or not. If they are, then there exists a maximum probability that the alphabet is same.

Self-Evaluation

CHECKLIST

After reading the chapter, I know these points:

	Agree	Disagree
I know that John McCarthy is widely considered as the Father of Artificial Intelligence for his pioneer role within the field.	☐	☐
I know that there are many future possibilities of AI in various fields such as in military, research, healthcare, entertainment and transportation.	☐	☐
I know that the specific skills are needed to pursue a career in the AI field such as Data Scientist, Machine Learning Engineer and Business Intelligence Developer.	☐	☐
I know that data collection is one of the most serious implications of AI systems.	☐	☐
I know that job loss is the major concern across the world due to adoption of automation system in various sectors.	☐	☐

Exercises

A. Tick [✓] the correct answer.

1. Who is considered as the Father of Artificial Intelligence?
   a. Alan Turing ☐ b. John McCarthy ☐ c. Paul McCartney ☐
2. In 2017, Google's AI ..... beat world champion Ke Jie in the board game Go.
   a. IBM Watson ☐ b. Standard Cart ☐ c. AlphaGo ☐
3. ..... was the first computer-controlled autonomous vehicle.
   a. Standard Cart ☐ b. AlphaGo ☐ c. IBM Watson ☐
4. ..... is the professional who make value of data.
   a. Data Scientist ☐ b. Data Analyst ☐ c. Data Developer ☐
5. Which of the following is not the adoption concern related to implication of AI system?
   a. Future jobs ☐ b. Pollution ☐ c. Security ☐

B. Write 'T' for True and 'F' for False statements.

1. In 1969, Chess playing computer Deep Blue by IBM won against chess world champion Garry Kasparov. ☐
2. Alexa was created by Google in 2014. ☐
3. AI can be used to provide simulation and training applications to the soldiers. ☐
4. Data Scientists are responsible to analyze data for prediction of future market trends. ☐
5. Data collection is one of the most serious implications of AI system. ☐

C. Fill in the blanks.

1. ....., a famous Scottish robot, was built in 1973.
2. In ....., Erica, a robot, became a news anchor in Japan.
3. Companies like Tesla and Uber are developing ....., which will rely heavily on AI to operate automatically.
4. Strong ..... skills are required for pursuing career in Data Science.
5. ..... and ..... are ethical concerns related to the implication of AI systems.

D. Differentiate between the following.

Machine Learning Engineer	Business Intelligence Developer
.....	.....
.....	.....
.....	.....
.....	.....

E. Answer in 1-2 sentences.

1. Explain the role of AI in entertainment?

   .....

   .....

2. List the career opportunities available in the fields of AI system.

.....

.....

3. Write any two skill sets required for the job of Machine Learning Engineer.

.....

.....

F. Answer briefly.

1. Explain the role of AI in healthcare.

.....

.....

.....

2. "AI bots can pose a serious threat." Explain.

.....

.....

.....

3. Explain the ethical concern related to the implication of AI.

.....

.....

.....

G. Application-based Question

Rishabh has strong mathematical skills and a good knowledge of programming languages. Which career in the field of the Artificial intelligence should he choose to pursue?

.....

Group Discussion

Divide the students into two groups and discuss — 'Artificial Intelligence: A threat to Future Employment'.

Activity Section

Creative Writing

Using your imagination and creativity, create a future-ready AI job advertisement for a business firm using the following points and save it in your 'Lab Activity' folder.

a. Nature of job

b. Set of specific skills required

Subject Integration

English

This integration will enhance the writing skills of the students.

Lab Activity

Future Wearables (Smart Clothing)

Skill Formation

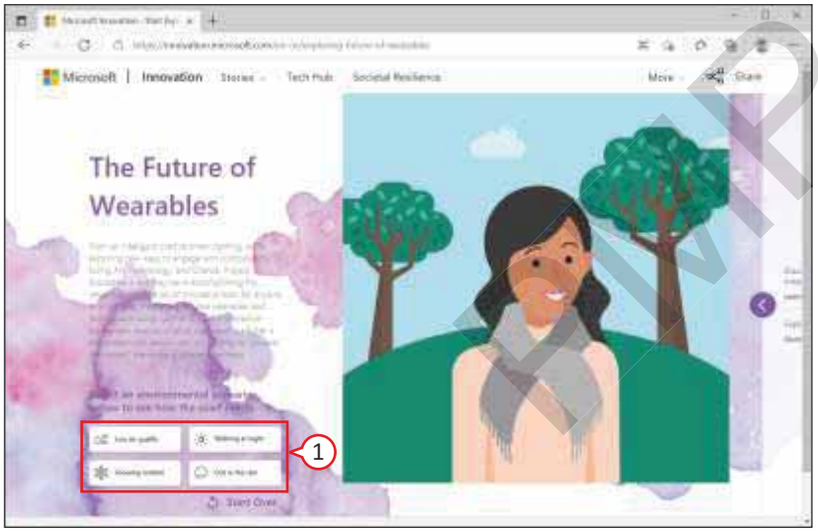
This activity would help students in developing their vision regarding the futuristic innovation in the field of AI.

The pace with which AI is progressing, one can hardly contemplate the change it could bring with time.

The idea of smart clothing has floated around for a few years. Little has come of it. Big companies like **Samsung**, **Google**, **OMSignal**, **Hexo Skin**, and **Under Armour** have begun thinking about ways to make the clothes as smart as the phone in your pocket. Since most wearables are fitness-focused, many companies are beginning to think beyond this, and the smart clothes they are working on may be the future of wearable tech.

Let us explore the future of clothing with an interactive experiment which explores what an **intelligent scarf** that is embedded with sensors can do, helping to uncover the hidden elements of your environment.

To do this activity, open the web browser and type the following URL in the address bar: **https://innovation.microsoft.com/en-us/exploring-future-of-wearables** and press **Enter** key. After doing this, you will get the following screen.



1. Click on any of the following environmental Conditional to see how the smart scarf reacts to.
   - Low air quality
   - Walking at night
   - Snowing outside
   - Out in the rain

Low air quality

In this scenario, the scarf would emit different color tones based on the air quality.

Walking at night

In this scenario, the scarf would start to emit brighter light after the sun goes down.

Snowing outside

In this scenario, the scarf would emit warmer light to inform the user to wear more warm clothes.

Out in the rain

In this scenario, the scarf would emit specific striped lights to inform the user that rain is about to come.

Worksheet-II

Chapters 6 - 10

A. Tick [✓] the correct answer.

1. A customer enters his/her personal and financial information through a ..... connection.
   a. Secure ☐ b. Insecure ☐ c. Common ☐
2. ..... is an Indian e-commerce company based in Bengaluru, India.
   a. Snapdeal ☐ b. Flipkart ☐ c. Amazon ☐
3. To add media to a website, ... attribute is used to identify the media source.
   a. IMG ☐ b. HREF ☐ c. SRC ☐
4. ..... control limits the web page visitor to only one choice from a list of choices.
   a. Radio ☐ b. Checkbox ☐ c. Select ☐
5. ..... is used for instructing the components what to do and when to do it.
   a. Blocks Editor ☐ b. Properties ☐ c. Viewer ☐
6. ..... apps are developed for a particular platform or iOS and Android devices.
   a. Web ☐ b. Hybrid ☐ c. Native ☐
7. String, list or tuple are termed as ..... .
   a. sequence ☐ b. function ☐ c loop ☐
8. Which of the following is not a type of loop?
   a. Conditional ☐ b. Counter ☐ c. Compute ☐
9. ..... is not the adoption concern related to implication of AI system?
   a. Future jobs ☐ b. Pollution ☐ c. Security ☐
10. In 1997, Chess playing computer ..... developed by IBM won against chess world champion Garry Kasparov.
    a. Deep Blue ☐ b. AlphaGo ☐ c. Standard Cart ☐

B. Write 'T' for True and 'F' for False statements.

1. The blog that contains video is sometimes called video blog or vlog. ☐
2. Before purchasing online, there is no need of doing research about that product. ☐
3. External style sheets define formatting and layout instructions. ☐
4. A password text box displays the characters entered by a user as asterisks (*). ☐
5. Utility app is not used by everyone of us on a daily basis. ☐
6. Backpack retains a copy of our blocks even when we exit App Inventor. ☐
7. Continue statement is used to unconditionally jump out of the loop. ☐
8. In operator is used to check existence of value in a sequence. ☐
9. Data scientists are responsible to analyze data for prediction of future market trends. ☐
10. Data collection is one of the most serious implications of AI system. ☐

C. Fill in the blanks.

1. In the web browser, look for a ..... icon for security concern.
2. The e-commerce that takes place using mobile device is called ..... .
3. ..... style sheet is used to apply a unique style to a single HTML element.
4. The ..... tag is used for linking current document to multiple documents.
5. ..... app enables us to connect with people who share similar personal or professional interests.
6. After creating, we can ..... our app in Android device or in emulator.
7. The ..... is used to repeat a block of statements until there is no item in any sequence.
8. The ..... loop in Python is used to repeat a block of statements for given number of times until the given condition is false.
9. Companies like Tesla and Uber are developing ..... which will rely heavily on AI to operate optimally.
10. ..... and ..... are ethical concerns related to the implication of AI systems.

D. Define the following.

1. COD
2. Shopping Cart
3. Text Box
4. Password Box
5. Education Apps
6. Range()
7. Grid()
8. Pack()
9. Data Scientist

E. Differentiate between the following.

1. B2C and B2C
2. Checkbox and Radiobutton in HTML
3. Native App and Web App
4. While-else loop and For-else loop
5. Break and Continue Statement
6. Machine Learning Engineer and Business Intelligence Developer

F. Answer the following questions.

1. What do you mean by blogging?
2. What are the security concerns one should consider while doing e-commerce?
3. Name the various input controls of a form.
4. What are the benefits of using CSS with HTML documents?
5. Name the areas of Component Designer window.
6. What is an App Store?
7. What are loops and why are they important in Python program?
8. Explain for-loop with example.
9. Explain the role of AI in entertainment?
10. Explain the ethical concern related to the implication of AI.

Project Work

Project Access

A. Create a database named 'Customer' and design two tables in it containing the following fields:

Table 1 : Customer

Fields: Customer_ID *(Primary Key)*, Customer_Name, Address, City, Phone, Email_ID

Table 2 : Invoice

Fields: Customer_ID *(Primary Key)*, Invoice_No, Date, Invoice_Amount

a. Create two forms for the above two tables using Form Wizard, which include all the fields of both the tables. Save them as the table names.

b. Using these two forms, enter five records in both the tables.

c. Close the forms and open both tables to view the records entered in the tables.

d. Close the tables, database, and Access.

B. You and two of your friends have started a small business. You provide help to big companies in the field of computer expertize. You have a small clientele and now you realize that you need to computerize your business. You have gathered some information as shown below:

Field Name	*Data Type*	*Field Size*	*Primary Key*	*Description*
Customer_ID	Short Text	4	Yes	Number of Customer ID
Name	Short Text	40		Name of the customer
Address	Short Text	40		Address of customer
Telephone	Number			Phone number of customer
Balance	Currency			Balance amount of customer
Amount_Paid	Currency			Amount paid by the customer
Amount_Due	Currency			Amount due from customer

Customer_ID	*Name*	*Address*	*Telephone*	*Balance*	*Amount _Paid*	*Amount_Due*
0ASD	Sunil	31, Dilshad Gdn	23000000	5000	3000	2000
0QWE	Kamal	34, Kirti Nagar	22220000	7000	6000	1000
0POI	Akash	1/3, Noida	56560000	9000	3000	6000
0LKJ	Sameer	24, Okhla	76540000	7000	6000	1000
0MNB	Tony	B-1, Karol Bagh	27500000	6000	6000	0
0ZXC	Ashok	19, Dilshad Gdn	88880000	9000	5000	4000
0ASD	Kunal	22/1, Noida	34570000	7000	6000	1000
0DFG	Rajesh	23, Faridabad	44540000	8000	2000	6000

Design and create a database in Access to store the data related to your business. Then create a table, enter data from the information given above and print the table.

C. Create a database 'Final Result', containing the following tables:

Table 1 : **Student** *(Master Table)*

Fields: Roll_No *(Primary Key)*, Name, Class, Section

Table 2 : **Unit Test 1** *(Contains the details of marks in Unit Test 1)*

Fields: Roll_No, Science, Maths, English, Hindi, SSt

Table 3 : **Unit Test 2** *(Contains the details of marks in Unit Test 2)*

Fields: Roll_No, Science, Maths, English, Hindi, SSt

Table 4 : **Final Exams** *(Contains the details of marks in the final exams)*

Fields: Roll_No, Science, Maths, English, Hindi, SSt

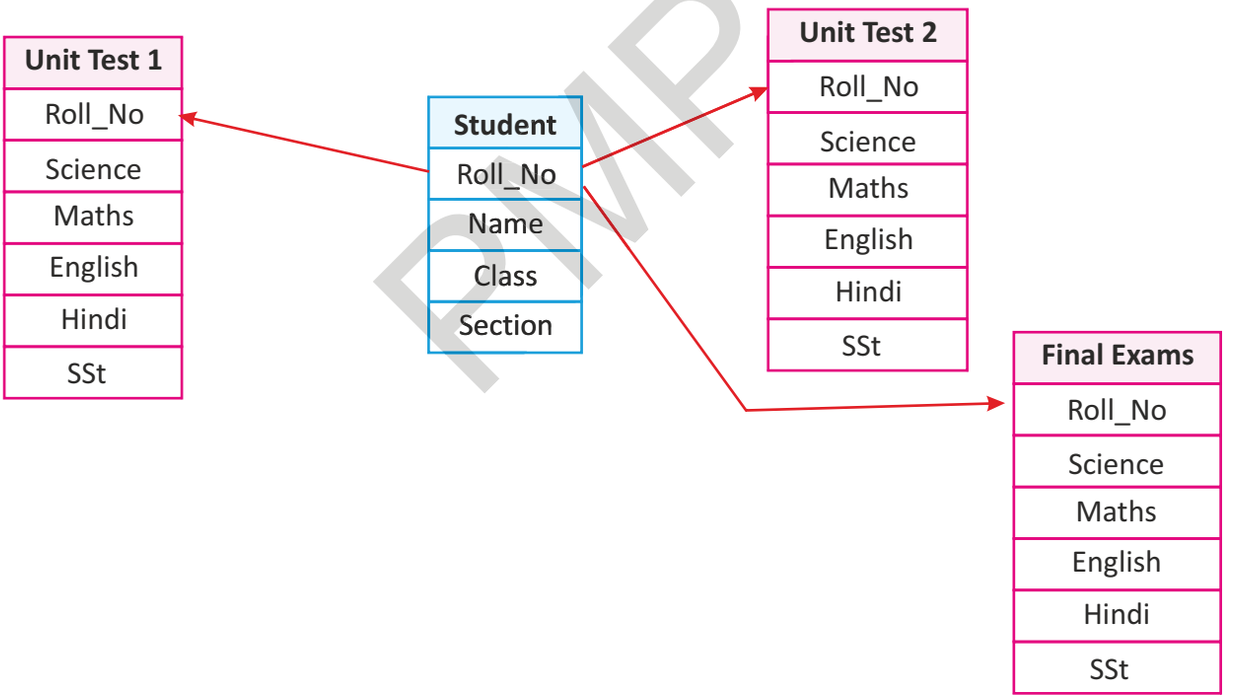
a. Create the tables in Design view and assign appropriate Data Type and description for the fields.

b. Assign the Roll_No field in the 'Student' table as the Primary key.

c. Click on the Relationship button after creating all the four tables.

d. Add all the tables selecting the table names one at a time and clicking on the Add button each time.

e. Click and drag the 'Roll_No' field in the 'Student' table and place it on the 'Roll_No' field of 'Unit Test 1' table. In the same way, define relationship as shown below:



f. Save the relationship.

g. Close the window.

h. Click on the 'Student' table name in the database window and enter four sets of records in it.

i. Enter records in Unit Test 1, Unit Test 2 and Final Exams table.

j. Close the window.

k. Click on the Relationship button and view the defined relationship.

D. Create a database named 'School' and design a table in it containing the following fields:

Field Name	*Data Type*	*Description*
S_No	Number	
Book_Name	Short Text	
Author_Name	Short Text	
Book_No	Number	
Issued_to	Short Text	
Date_of_Issuing	Date	
Data_of_Return	Date	

Now, follow these steps to create the table in Design view.

a. Type the appropriate description for each field and save the table as 'Library'.

b. Open the table 'Library' in Design view.

c. Position the cursor in the field S_No and set it as the Primary Key.

d. Enter the record for each field by positioning the cursor in each cell.

e. After completing the record entries, press Ctrl + S to save the table.

f. Click (x) to close the Table design window.

Project Python

A. Create programs for print the following sequences using for loop.

a. 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

b. 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11

c. -1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, -15

B. Create programs for calculate sum of following sequences using while loop.

a. 4+8+12+16+20+24+28+32+36+40

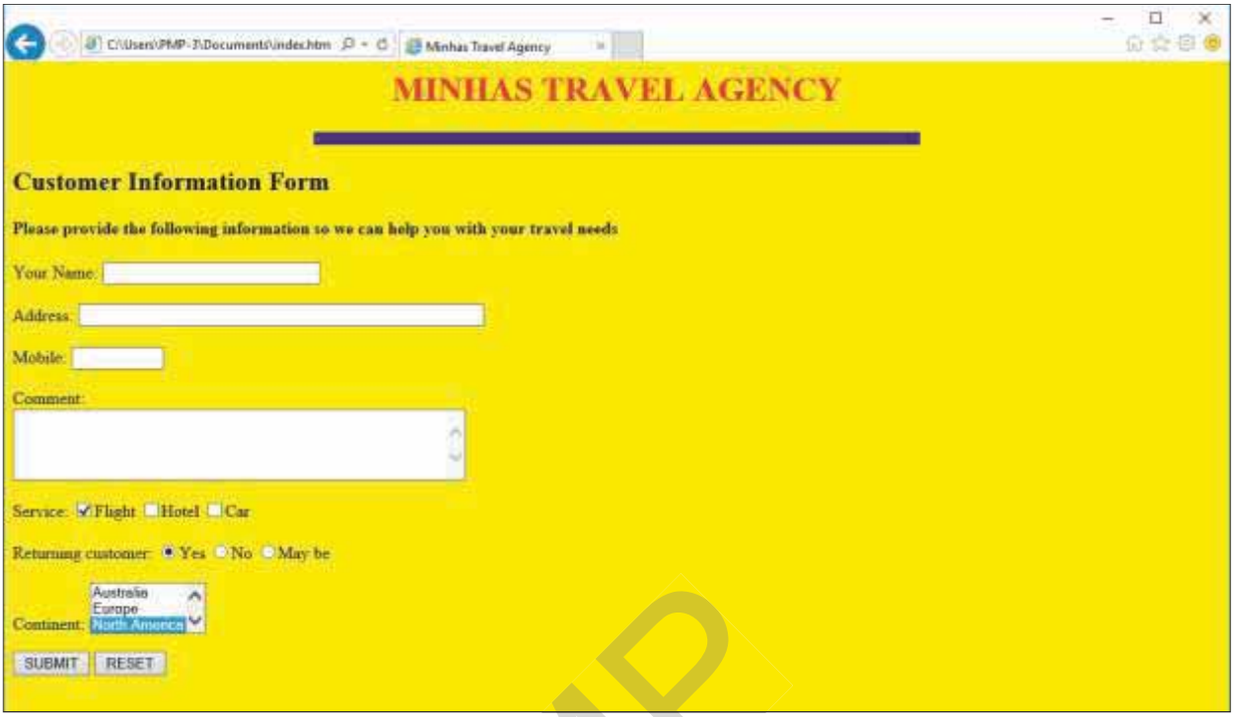
b. 1+3+5+7+9+11+13+15+17+19+21

c. 10+20+30+40+50+60+70+80+90

C. Write the code for the following GUI application using Grid() method in Python.

Project HTML

A. Create a web page to display form in the format shown below.



Now, perform the following tasks:

a. Set background color yellow, text color red, heading size H1, center aligned. Insert HR in Blue color, size 10, width 50%.

b. Set text color of sub-heading as blue and heading size H2.

c. Set text color of next heading blue and heading size H4.

d. Add your name, address, mobile, comment, checkbox for service, radio button for returning costumer, list box for continent.

e. Add SUBMIT and RESET buttons.

B. Your computer teacher has asked you to create a website for the school.

The site should have:

a. four pages including a home page.

b. relevant pictures in all the pages.

c. homepage giving general introduction of the school with links to reach other pages such as school infrastructure, sports and recreation facilities, teacher and staff and academics.

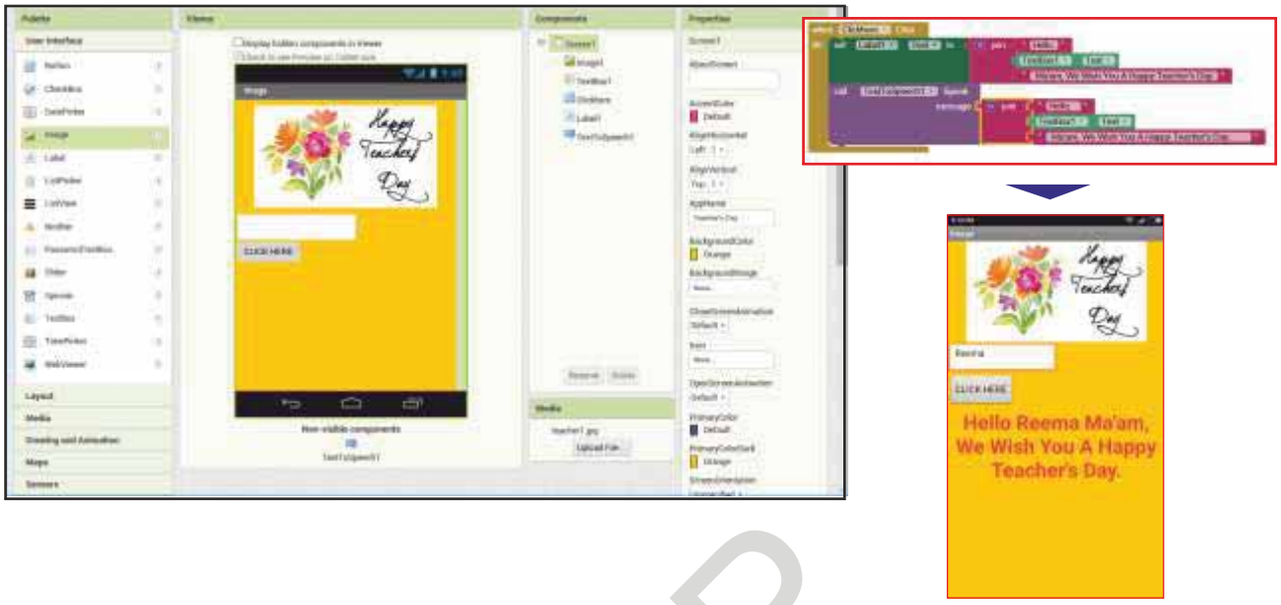
d. a separate page on infrastructure giving details such as number of classrooms, library, labs, swimming pool and computer room; it should also contain a link to reach back to the home page.

e. a dedicated page on sports and recreation giving information on sports facilities like basketball, cricket, table tennis, football and recreation facilities like media room, library, computer room, etc. A link connecting to the home page is a must.

f. a page on staff giving information like name of teachers, their role, their contribution, etc. and a link to home page.

Project MIT App Inventor

Create an app on Teacher's Day. Add four components on the screen—Image, TextBox, Button, label and TextToSpeech.



Steps to Create an App

***** Creating an App*****

a. Open MIT App Inventor and create New App Inventor Project and name the project.

b. Change the screen appearance using different formatting options given in the Properties palette.

c. Upload an image for the Teacher's Day.

Note: *Your image may vary and it should be of small size.*

d. From Component Palette, drag the Image, Textbox, Button, and Label option to viewer palette.

e. Rename the Button option as "**Click Here**". (Here you can use different formatting options for each from the Properties palette.)

f. Open **Media** Drawer from the palette and drag "Text to Speech" to viewer palette.

***** Component Designing*****

a. Click on **Blocks** button.

b. Click on **CLICK HERE** button component and then choose **"When click here button. click do"** block.

c. Click on **Label 1** component and choose "**Set Label 1 . text to**" block.

d. Drag and snap the Label block to **Click Here** button block.

e. Click the **Text** block and then drag the **Join Block** and snap it into **Label Block**.

f. Add **Strings** to the Join block by right clicking on the settings. (on the top left corner of the Join block)

g. Click **Text** in Built in area, choose the **string** block and snap it in first and third place holders of Join string block.

h. Type the Text "**Hello** " in first string and "**, Ma'am, We Wish You A Happy Teacher's Day.**" in second string block.

i. Click on the **Text box 1** component, drag and snap Text box1 . text block in middle placeholder .

j. Click on **Text to Speech1**, drag and snap **Call to Speech1. Speak message** block inside "Click Here" button block under the **Label1** block.

k. Duplicate the Join block and drag and snap the duplicate Join block in text to speech block.

l. Run the app.

Additional Information

Cybercrime

Any illegal act involving the use of Internet or related services generally is referred to as **cybercrime**. In another words, the term **cybercrime** refers to Internet-based illegal acts such as distributing malicious software or committing identity theft. Today, fighting cybercrime is one of the government's top priorities.

Perpetrators of cybercrime typically fall into one of these basic categories:

CYBERSTALKER: It is a crime in which the attacker harasses a specific individual (victim) using electronic communication, such as e-mail or instant messaging (IM), or messages posted to a website. There are several forms of cyberstalking that can take place including:

- placing orders for delivery in someone else's name
- gathering personal information on the victim and spreading false rumors
- encouraging others to join in the harassment
- threatening to cause harm through email

CYBERBULLY: It is a harassment using technology, often involving teens and preteens. Unlike verbal bullying, the perpetrators hide behind the anonymity of the Internet and can reach a wide audience quickly. Victims usually fall in trap that comes in the form of text messages, email, or online social network posts. The examples of cyberbullying are sending or forwarding threatening text messages, posting embarrassing or altered pictures of someone without his or her permission, or setting up a fake online social network page where others make objectionable comments and spread rumors about someone.

CYBEREXTORTIONIST: It is someone who demands payment to stop an attack on an organization's technology infrastructure. These perpetrators threaten to expose confidential information, exploit a security flaw, or launch an attack that will compromise the organization's network — if they are not paid a sum of money.

CYBERTERRORIST: It is someone who uses the Internet or network to destroy or damage computers for political reasons. The cyberterrorist might target the nation's air traffic control system, electricity-suppliying companies, or telecommunications infrastructure.

CYBERSPY: It is a form of cybercrime in which hackers target computer networks in order to gain access to classified or other information that may be profitable or advantageous for them. This can be disastrous for companies if the attackers use stolen information to manufacture duplicate products and gain market share.

CYBERWARFARE: It refers to the use of digital attacks– like computer viruses and hacking– by one country to disrupt the vital computer systems of another, with the aim of causing damage, death or destruction.

Blockchain Technology

The **blockchain** is a decentralized ledger of all the transactions across a P2P (peer-to-peer) network. Using this technology, participants can confirm transactions without the need of a central certifying authority such as a bank. Its applications include fund transfer, setting trades and voting, among others.

Blockchain Technology Uses


DIGITAL CURRENCY


FINANCE


IOT


DATA STORAGE


ONLINE VOTING


GOVERNANCE


HEALTHCARE


INSURANCE

Benefits

TRANSPARENCY AND TRACKING

SIMPLER AND FASTER

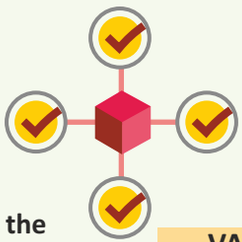
REDUCED COSTS

INCREASED TRUST

Working of Blockchain Technology


Someone requests a transaction.


The requested transaction is **broadcasted to a P2P network consisting of computers**, known as **nodes**.


The network of nodes **validates the transaction and the user's status** using a known algorithm.

VALIDATION MAY INCLUDE

- CONTRACTS
- CRYPTOCURRENCY
- OTHER RECORDS


Once verified, the transaction is combined with other transactions **to create a new block of data for the ledger**.


The new block is then added to the existing blockchain, in a way that is permanent and unalterable.


The transaction is complete.

Cryptocurrency

Cryptocurrency is a medium of exchange created and stored electronically in blockchain, using encryption techniques to control the creation of monetary units and to verify the transfer of funds. The best example of cryptocurrency is **Bitcoin**.

IT Careers

In today's technology-rich world, the technology industry is a major source of career opportunities worldwide. This industry has created thousands of high-tech career opportunities. As technology changes, so do the available careers and requirements. New careers available in social media and mobile technologies did not even exist a few years ago. For this reason, you should stay up to date with technological developments.

There are many types of fields in which computer professionals are required. **Computer professionals** are those who deal with computer industry to develop something. They may design, build, sell, lease, or repair hardware, or they may sell, market, or write software.

MANAGEMENT

In management, the role of computer professional includes directing the planning, research, development, evaluation, and integration of technology. Following are the jobs available in it under the management field.

Jobs	Functions
Chief Information Officer (CIO)	Directs company's information service and communication functions
E-commerce Director	Supervises the development and execution of Internet or e-commerce systems; works with the company's marketing divisions
Network or Wireless Network Manager	Installs, configures, and maintains company's administrator network and Internet systems; identifies and resolves connectivity issues
Project Manager	Oversees all assigned projects, allocates resources, selects teams, performs system analysis and programming tasks

SYSTEM DEVELOPMENT AND PROGRAMMING

In system development and programming, the role of computer professional includes analyzing, designing, developing, and implementing new information technology, and maintaining and improving existing systems. Following are the jobs available and their functions under the System Development and Research field.

Jobs	Functions
Computer Programmer	Writes program in a variety of computer languages, such as Visual Basic, Java, C#, F#, and C++, Updates and expands existing programs; debugs program by testing and fixing error
Computer Scientist	Researches, invents, and develops innovative solutions to complex software requirements or problems
Database Analyst	Uses data modeling techniques and tools to analyze, tune, and specify data usage within an application area
Software Engineer	Specifies, designs, implements, tests, and documents high-quality software in a variety of fields, including robotics, operating systems, animation, and applications
System Analyst	Works closely with users to analyze their requirements, designs and develops new information systems, and incorporates new technologies
System Programmer	Installs and maintains operating system software, and provides technical support to the programming staff

Technical Leader	Guides design, development, and maintenance tasks; serves as interface between programmer/developer and management
Technical Writer	Works with the analyst, programmer, and user to create system documentation and user materials
Web Software Developer	Analyzes, designs, implements, and supports web applications; works with HTML, Ajax, JavaScript, and multimedia

TECHNICAL SERVICES

In technical services, the role of computer professional includes evaluating and integrating new technologies, administering the organization's data resources, and supporting the centralized computer operating system and servers. Following are the jobs available and their functions under the Technical Services.

Jobs	Functions
Computer Technician	Installs, maintains, and repairs hardware; installs, upgrades, and configures software; troubleshoots hardware problems
Database Administrator	Creates and maintains the data dictionary; monitors database performance
Graphic Designer	Develops visual impressions of products for advertisements and marketing materials
Quality Assurance Specialist	Reviews programs and documentation to ensure they meet the organizational standards
Storage Administrator	Installs, maintains, and upgrades storage systems; analyzes the storage needs of organization
Web Designer	Develops graphical content using Photoshop, Flash, and other multimedia tools
Web Administrator	Maintains website of an organization; creates web pages; oversees website performance

OPERATIONS

In operations, the role of computer professional involves operating the centralized computer equipment and administering the network, including both data and voice communications. Following are the jobs available and their functions under the Operations.

Jobs	Functions
Computer Operator	Performs equipment-related activities such as monitoring performance, running jobs, backup, and restoring
Data Communication Analyst	Installs and monitors communications equipment and software; maintains Internet / WAN connections

TRAINING

In training, the role of computer professional includes teaching employees how to use components of the information system or answering specific user questions. Following are the jobs available and their functions under the Training.

Jobs	Functions
Computer Instructor	Teaches students computer science and information technology skills
Corporate Trainer	Teaches employees how to use software, design and develop systems, program, and perform other computer-related activities
Help Desk Specialist	Answers computer-related questions on the phone or in a chat room.

SECURITY

In security, the role of computer professional includes developing and enforcing policies that are designed to safeguard data and information of an organization from unauthorized users. Following are the jobs available and their functions under the Security.

Jobs	Functions
Chief Security Officer (CSO)	Responsible for physical security of organization property and people; in charge of securing computing resources
Computer Security Specialist	Responsible for the security of data and information stored on computers and mobile devices within an organization
Network Security Administrator	Configures routers and firewalls; specifies web protocols and enterprise technologies
Security Administrator	Administers network security access; monitors and protects against unauthorized access

WEB MARKETING AND SOCIAL MEDIA

Careers in web marketing and social media require you to be knowledgeable about web-based development platforms, social media apps, and marketing strategies.

Jobs	Functions
Customer Relationship (CRM) Management Specialist	Integrates apps and data related to customer inquiries, purchases, support requests, and behaviors in order to provide a complete application that manages a company's relationships with its customers
Internet/Social Media Marketing Specialist	Directs and implements an organization's usage of Internet and social media marketing, including Facebook pages, Twitter feeds, blogs, and online advertisements
Search Engine Optimization (SEO) Expert	Writes and develops web content and website layouts so that they appear at the beginning of search results when users search for content
User Experience (UX) Designer	Plans and designs software and apps that consider a user's reaction to a program and its interface, including its efficiency, effectiveness, and ease of use

APP DEVELOPMENT AND MOBILE TECHNOLOGIES

Careers in app development and mobile technologies require you to have knowledge about trends in the desktop and mobile app market, as well as the ability to develop secure apps for a variety of computers and mobile devices.

Jobs	Functions
Desktop or Mobile App Developer	Converts the system design into the appropriate application development language, such as Visual Basic, Java, C#, and Objective C and develops toolkits for various platforms
Games Designer/Programmer	Designs games and translates designs into a program or app using an appropriate application development language

NATIONAL CYBER OLYMPIAD
SAMPLE PAPER — SYLLABUS 2021-22

CLASS 8

SYLLABUS

Section – 1 : Verbal and Non-Verbal Reasoning.

Section – 2 : Fundamentals of Computers, Internet & Viruses, HTML-[Html, Head, Title, Body (Attributes: Background, Bgcolor, Text, Link, Alink, Vlink), Font (Attributes: Color, Size, Face), Center, BR, HR (Attributes: Size, Width, Align, Noshade, Color), Comment tag(<!---->), <H1>..<H6>, <P>, <B>, <I>, <U>, <IMG>, Html Elements: A, Ul and Ol (Attributes: Type, Start), Li], Flash CS6, MS-Access, Networking, MS-Word (Exploring File tab, Language and Translate options, Tracking features -Comments, Reviewing Pane, Tracking Changes, Comparing, Combining and Protecting documents, Working with References), MS-PowerPoint (Exploring File tab and Slide Show tab, Comparing, Combining and Protecting presentations), MS-Excel(Exploring File tab, Useful Formulas and Functions - IF,Even, Odd, LCM, GCD, Power, Product, Round, Sqrt, Sum, Min, Max, Average, Count, Upper, Lower And Replace, Cell referencing, Using Defined Names group), Memory & Storage Devices, Basics of Cyber Crimes, Cyber Laws, Operating Systems(Introduction, Features, Types-single user and multi-user), Latest Developments in the field of IT.

Section – 3 : Higher Order Thinking Questions - Syllabus as per Section – 2.

Questions are based on Windows 7 and MS-Office 2010. **Total Questions: 50** **Time: 1 hr.**

PATTERN & MARKING SCHEME			
Section	**(1) Logical Reasoning**	**(2) Computers & IT**	**(3) Achievers Section**
No. of Questions	**10**	**35**	**5**
Marks per Ques.	**1**	**1**	**3**

LOGICAL REASONING

1. If in a certain code language, SAND is written as VDQG and BIRD is written as ELUG, then how will LOVE be written in the same language?

(A) PRYG (B) ORTG (C) NPUH (D) ORYH

2. Which of the following Venn diagrams best represents the relationship among "tennis fans, cricket players and students"?

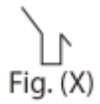
(A)  (B)  (C)  (D) 

3. A, B, C, D, E and F, not necessarily in that order, are sitting on six chairs regularly placed around a round table facing inside. It is observed that A is between D and F, C is opposite to D, D and E are not on neighbouring chairs. The person sitting opposite to B is _____.

(A) A (B) D (C) E (D) F

4. In which of the following figures, Fig. (X) is exactly embedded as one of its parts?

(A)  (B)  (C)  (D) 



5. Find the missing term in the given series. **DMP**, **FLN**, **HKL**, **JJJ**, ?

(A) MII (B) LIH (C) III (D) MIF

COMPUTERS AND INFORMATION TECHNOLOGY

6. Which of the following is NOT available as a category in Control Panel of Windows 7?

(A) System and Security (B) Programs (C) Bluetooth settings (D) Ease of Access

7. Which of the following will you use to convert the selected text into a hyperlink in MS-Word 2010?

(A)  (B)  (C)  (D) 

8. Which of the following is CORRECT in HTML?

(A) <hr> (B) <HR> (C) <B> Bold Text </B> (D) All of these

9. Computers use the seven digit code called ASCII. What does ASCII stand for?

(A) American Standard Code for Information Interchange (B) Association of Software Coding and Information Institute
(C) American Standard Computing and Information Institute (D) American Scientists Convention for Information Interchange

10. Which of the following is NOT a valid function of MS-Excel 2010?

(A) COUNTIF (B) SUMIF (C) COUNTA (D) COUNTUP

11. In Flash CS6,  is called ____ tool.

(A) Fill color (B) Paint bucket (C) Ink bottle (D) Lasso

12. In MS-PowerPoint 2010, Format Painter is used to _____.

(A) Copy formatting from one place and apply it to another (B) Reset the position, size and formatting of the slide
(C) Format text to the left (D) Increase the indent level

13. Which of the following statements is INCORRECT about memory and storage devices?

(A) Cache memory makes memory transfer rates higher and thus raises the speed of the processor.

(B) A storage device is a hardware component that writes data to and reads data from a storage medium.

(C) ROM loses its data when you turn off the computer.

(D) Hard disks can be divided into one or more logical disks called partitions.

ACHIEVERS SECTION

14. Rearrange the steps given below to insert a motion tween in Flash CS6, first and last steps are given for you.

First : Draw a shape at Frame 1

(i) Drag the playhead to a new frame and reposition your object

(ii) Select the shape and convert it to a symbol

(iii) Go to Insert tab → Motion tween

Last: Press Ctrl + Enter ↵ to play the tween.

(A) (ii) → (iii) → (i) (B) (i) → (iii) → (ii) (C) (iii) → (i) → (ii) (D) (iii) → (ii) → (i)

15. Which of the following statements is CORRECT about 'Sneakernet'?

(A) Transferring computer files between computers by physically moving removable media such as CDs, flash drives.

(B) Unauthorised access of information from a wireless device.

(C) The process of converting data in a form so that an unauthorised person cannot understand it.

(D) A private computer network in which multiple PCs are connected to each other.

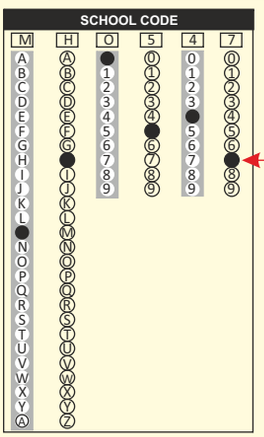
SAMPLE ANSWER SHEET

1. Name: If your name is SAURAV GUPTA. then you should write as follows:

S	A	U	R	A	V		G	U	P	T	A												

2. Father's Name: If your father's name is DINESH GUPTA then you should write as follows:

D	I	N	E	S	H		G	U	P	T	A												

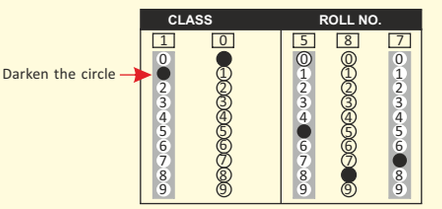


3. SCHOOL CODE
Write your school code i.e. if your school code is MH0547 darken as follows:

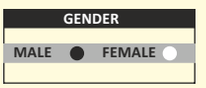
Darken the circle

4. CLASS
If you are in Class 10 then you should darken as follows:

5. ROLL NO.
If your roll no. is 587, then you should write and darken the circles as follows:



6. GENDER
If you are a boy then darken **Male** circle



7. If your choice for Answer 1 is C, then you should darken the circle as follows: 1. Ⓐ Ⓑ ● Ⓓ

MARK YOUR ANSWERS WITH HB PENCIL/BALL POINT PEN (BLUE/BLACK)

National Cyber Olympiad

1. Ⓐ Ⓑ Ⓒ Ⓓ	**4.** Ⓐ Ⓑ Ⓒ Ⓓ	**7.** Ⓐ Ⓑ Ⓒ Ⓓ	**10.** Ⓐ Ⓑ Ⓒ Ⓓ	**13.** Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ	**5.** Ⓐ Ⓑ Ⓒ Ⓓ	**8.** Ⓐ Ⓑ Ⓒ Ⓓ	**11.** Ⓐ Ⓑ Ⓒ Ⓓ	**14.** Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ	**6.** Ⓐ Ⓑ Ⓒ Ⓓ	**9.** Ⓐ Ⓑ Ⓒ Ⓓ	**12.** Ⓐ Ⓑ Ⓒ Ⓓ	**15.** Ⓐ Ⓑ Ⓒ Ⓓ

ANSWERS

1. (D)	2. (A)	3. (D)	4. (A)	5. (B)	6. (C)	7. (A)	8. (D)	9. (A)	10.(D)
11. (B)	12. (A)	13. (C)	14. (A)	15. (A)					

SPACE FOR ROUGH WORK