2023

WWWPCGYAN.COM

GROW YOUR KNOWLEDGE

BASIC FUNDAMENTAL HARDWARE SOFTWARE NETWORK

WRITTER BY
-LUCKY

WWW.PCYGAN.COM

Computer Fundamental

What is Computer

Computer is an electronic device which accepts the data from the user and gives the result according to our desire. Computer has the ability to store, retrieve and process data. With the help of Computer you can type documents, send email, play games, print, browse information on the internet, can calculate, watch movies etc.

What is data?

The collection of facts, figures, objects etc. Ex. 50

What is Information?

The meaningful data or result of data as output is known as information.

Ex. 50 Rs.

Full form of Computer

- **C=Commonly**
- **O=Operating**
- **M=Machine**
- **P=Purposeful**
- **U= Used for**
- **T=Technically**
- **E874=Education**
- **R=Research for**

History of Computer

- **Abacus:** One of the earliest and most well-known devices was an abacus. An abacus is a mechanical device used to aid an individual in performing mathematical calculations.
- **Napier's bones**: Invented by John Napier in1614.Allowed the operator to multiply, divide and calculate square and cube roots by moving the rods around and placing them in specially constructed boards.
- **Slide Rule:** Invented by William Oughtre din 1622. It is based on Napier's ideas about logarithms. Used primarily for multiplication, division, roots, logarithms, Trigonometry. Not normally used for addition or subtraction.
- **Pascalin**

- **2 e:** Invented by Blaise Pascal in1642.It was its limitation to addition and subtraction. It is too expensive.

- **Atanas off-Berry :**Computer (ABC): It was the first electronic digital computing device. Invented by Professor John Atanas off and graduate student Clifford Berry at Iowa State University between 1939 and 1942.
- **ENIAC:** ENIAC stands for Electronic Numerical Integrator and Computer. It was the first electronic general-purpose computer. Completed in 1946.Developed by John Presper Eckert and John Muchly.
- **-UNIVAC 1:** The UNIVAC I (Universal Automatic Computer 1) was the first commercial computer. Designed by John Presper Eckert and JohnMauchly.
- **EDVAC:** EDVAC stands for Electronic Discrete Variable Automatic Computer. It was the First Stored Program Computer designed by Von Neumann in 1952.It has a memory to hold both stored program as well as data.
- **The First Portable Computer:** Osborne 1 – the first portable computer released in 1981 by the Osborne Computer Corporation.
- **The First Computer Company:** The first computer company was the electronic controls, Company. Founded in 1949 by John Presper Eckert and John Mauchly.

Generations of Computer

There are five generations of computers:

FIRST GENERATION -

Introduction:

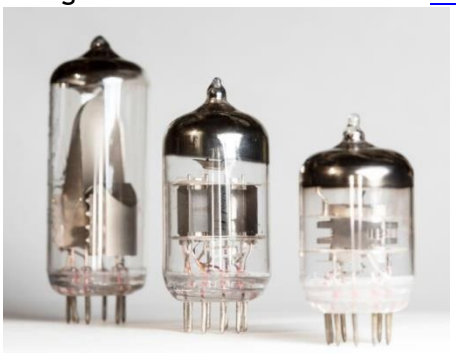
1946-1959 is the period of first generation computer.

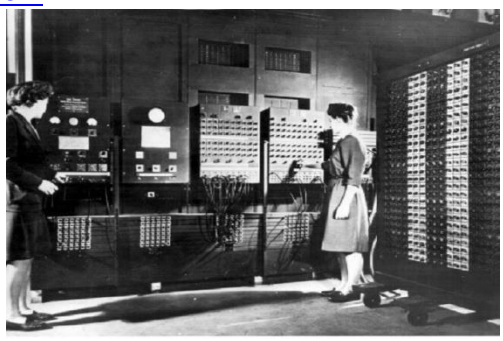
- **J.P.Eckert** and **J.W.Mauchy** invented the first successful electronic computer called ENIAC, ENIAC stands for
- "Electronic Numeric Integrated And Calculator". It made use of vacuumtubes which are the only electronic component available during those days .

Few Examples are:

- **ENIAC:** Electronic Numeric Integrated And Calculator"
- **EDVAC:** Electronic Discrete Variable Automatic Computer
- **UNIVAC:** Universal Automatic Computer

Vacuum Tubes & ENIAC Computer





SECOND GENERATION

Introduction:

- 1959-1965 is the period of second-generation computer.
- Second generation computers were based on Transistor instead of vacuum tubes.

Few Examples are:

- IBM 7094: International Business Machines
- CDC 1604: Control Data Corporation
- CDC 3600: Control Data Corporation
- UNIVAC 1108 : : Universal Automatic Computer

Transistor & IBM 7094

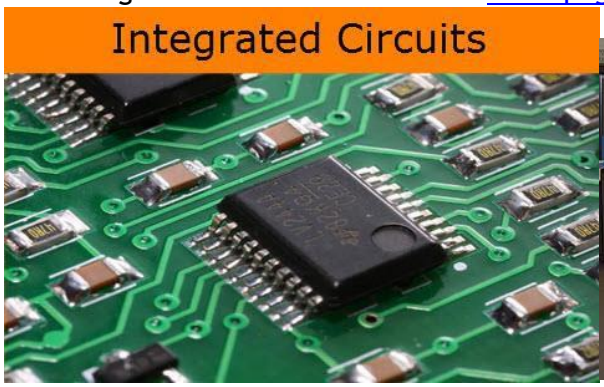
THIRD GENERATION

Introduction: 1965-1971 is the period of third generation computer. These computers were based on Integrated circuits.

Few Examples are:

- IBM 360: International Business Machines
- IBM 370:International Business Machine

Integrated Circuits & IBM 360



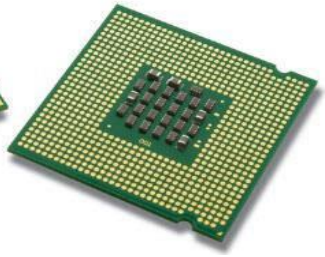
FOURTH GENERATION

Introduction:

- 1971-1980 is the period of fourth generation computer. This technology is based on Microprocessor.
- A microprocessor is used in a computer for any logical and arithmetic function to be performed in any program.
- Graphics User Interface (GUI) technology was exploited to offer more comfort to users.

Few Examples are:

o IBM 4341: International Business Machines
o DEC 10: Digital Equipment Corporation



FIFTH GENERATION

Introduction:

- The period of the fifth generation in 1980-onwards. This generation is based on artificial intelligence.
- This generation is based on ULSI (Ultra Large Scale Integration) technology resulting in the production of microprocessor chips having ten million electronic component.

Few Examples are:

- **Desktop**

- **Laptop**

Artificial Intelligence:

The capacity to given by humans to machines to memorize and learn from experience, to think and create , to speak, to judge and make decisions.

Fifth generation computers are in designing mode with Artificial Intelligence technology.

What Is Data?

Data is defined as a collection of individual facts or statistics. Data is a raw form of knowledge.

Data can come in the form of text, observations, figures, images, numbers, graphs, or symbols. For example, data might include individual prices, weights, addresses, ages, names, temperatures, dates, or distances.

There are two main types of data:

Quantitative data is provided in numerical form, like the weight, volume, or cost of an item.

Qualitative data is descriptive, but non-numerical, like the name, gender, or eye color of a person.

What Is Information?

Information is defined as knowledge gained through study, communication, research, or instruction. information is the result of analyzing and interpreting pieces of data.

Difference between Information and Data:

S.NO	DATA	INFORMATION
1	**Data are the variables that help to develop ideas/conclusions.**	**Information is meaningful data.**

S.NO	DATA	INFORMATION
2	Data are text and numerical values.	Information is refined form of actual data.
3	Data doesn't rely on Information.	While Information relies on Data.
4	Bits and Bytes are the measuring unit of data.	Information is measured in meaningful units like time, quantity, etc.
5	Data can be easily structured as the following: 1.Tabular data 2.Graph 3.Data tree	Information can also be structured as the following: 1. Language 2. Ideas 3. Thoughts
6	Data does not have any specific purpose	Information carries a meaning that has been assigned by interpreting data.
7	It is low-level knowledge.	It is the second level of knowledge.
8	Data does not directly helps in decision making.	Information directly helps in decision making.
9	Data is collection of facts, which it self have no meaning.	Information puts those facts into context.
10	Example of data is student test score.	Example of information is average score of class that is derived from given data.

Characteristics /advantages and features of Computer

- **Speed:** Computers are very fast. They can do a variety of jobs within a few seconds. Computer is an electronic device. It compares speed of the electronic flow.
- **Diligence:** Computers are diligence. They can do the work for very long time without getting tired and without getting bored.

- **Accuracy:** Computer accuracy is high. Computer never make a mistake and even if a mistake is taking place that may be due to human.
- **Versatility**: Computers are versatile. They can do difference type of tasks like play games on computer, graphic designing work and many more like accounting.
- **Storage:** Data in form of files can be stored in computer so that user can use it as per his requirements in future.
- **Automation:** Computer is an automatic machine. Automation is the ability to perform a given task automatically. Once the computer receives a program i.e., the program is stored in the computer memory, then the program and instruction can control the program execution without human interaction.
- **Reduction in Paperwork and Cost:** The use of computers for data processing in an organization leads to reduction in paperwork and results in speeding up the process. As data in electronic files can be retrieved as and when required, the problem of maintenance of large number of paper files gets reduced.

Computer – Applications

- **Banking and Financial Company:** Computers are used in bank for electronic money transfer, voucher, ledger, bank sheet, etc. Different systems are used in Financial Company such as ATM (Automatic Teller Machine), EFTS (Electronic Fund Transfer System) etc which is computer based systems.

- **Education:** Computer is a very effective tool which can be used for teaching and learning, result processing, student data processing, question preparation, handouts and note preparation, etc and also online education.

- **Hospital:** The research in health is done with the help of computer. It is applied to medicine, surgery and research.

- **Offices:** Computers are used in small offices as well as large offices. It is used for preparing reports, storing/deleting reports, updating reports etc. Most of the offices use word processing package, spreadsheet package, graphics package, presentation package, database package etc.

- **Communications:** E-mail, e-fax, internet, etc are computer based communications. The computer and Internet integration is the backbone of recent communication
- . **Marketing: In marketing, uses of the computer are following-**

- ✓ **Advertising -** With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products.
- ✓ **Home Shopping -**Home shopping has been made possible through the use of computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

- **Government**: Computers play an important role in government services. Some major fields in this category are- Budgets, Sales tax department, Income tax department, Computation of male/female ratio, Computerization of voter's lists, Computerization of PAN card, Weather forecasting.

Disadvantages of Computers:

Following are certain disadvantages of computers-

- ➢ A computer is a machine that has no intelligence to perform any task.
- ➢ Each instruction has to be given to the computer.
- ➢ A computer cannot take any decision on its own.
- ➢ It functions as per the user's instruction; thus, it is fully dependent on humans.
- ➢ The operating environment of the computer should be dust free and suitable.
- ➢ Computers have no feelings or emotions.
- ➢ It cannot make judgment based on feeling, taste, experience, and knowledge unlike humans.

Classification of Computers

Computers are broadly classified into purpose, size

❖ **Analog Computer:** Analog Computer is a computer by which physical quantities are measured. They measure temperature, pressure, speed, length and width, etc. These computers are used in the fields of science, engineering, medical, etc. This is done because these are the areas where physical quantities are used the most. Examples of Analog Computer are: thermometer, speedometer, clock etc.

Analog Computer

❖ Digital Computer

Digital Computer is the computer by which the number is calculated. The inputs and outputs of these computers are in the form of binary code (0,1)which is machine language. They are commonly used in all places. Exp: Such as: at home, office, shop, railway, hotel, etc. Examples of Digital Computer: Desktop computers, laptops, tablets, smart phones, digital clock and calculators, etc.

❖ Hybrid Computer

Hybrid Computer is the computer that holds the characteristics of both Analog Computer and Digital Computer. That is, they can also measure physical quantities and can also calculate points.

Example: Hybrid computer installed on a petrol pump also measures the amount of petrol and calculates its value. It is capable of both functions.

On the basic of size:-

The four basic types of computers are as under:

- **Supercomputer :-**The most powerful computers used by large organizations in terms of performance and data processing are the Supercomputers. These computers are used for research and exploration purposes, like NASA uses supercomputers for launching space shuttles, controlling them and for space exploration purpose. The supercomputers are very expensive and very large in size.

Super Computer

- **Mainframe computer :**Although Mainframes are not as powerful as supercomputers, but certainly they are quite expensive, and many large firms & government organizations uses Mainframes to run their business operations. Banks educational institutions & insurance companies use mainframe computers to store data about their customers, students & insurance policy holders.

Mainframe Computer

- **Minicomputer :** Minicomputers are used by small businesses & firms. Minicomputers are also called as "Midrange Computers". These are small machines and can be accommodated on a disk with not as processing and data storage capabilities as super-computers & Mainframes. For example, a production department can use Mini-computers for monitoring certain production process.

Minicomputer

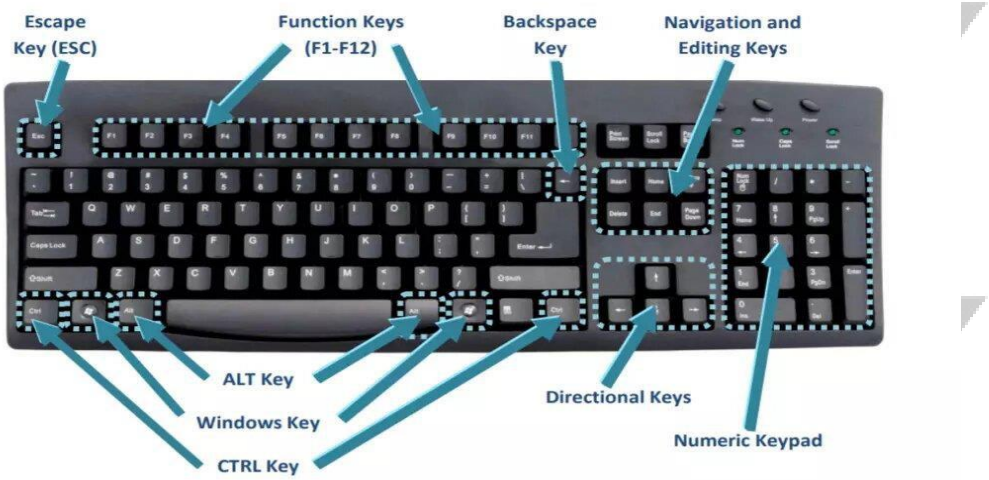
- **Micro computer :** Desktop computers, laptops, personal digital assistant (PDA), tablets & smart phones are all types of microcomputers. The micro-computers are widely used & the fastest growing computers. These computers are the cheapest among the other three types of computers. The Micro-computers are specially designed for general usage like entertainment, education and work purposes. Well known manufacturers of Micro-computer are Dell, Apple, Samsung, Sony & Toshiba.

Components of Computers:

1. Hardware:- Hardware is the collection of physical parts of a computer system. This includes the computer case, monitor, keyboard and mouse. It also includes all the parts inside the computer case, such as the hard disk drive, motherboard and many others.

- **Input Devices**
- **Output Devices**
  - **Input Devices:** The input devices take data into a form of the computer can process. The most common input devices are keyboard, mouse, scanner etc.

✓ **Keyboard:** The keyboard is an input device. Keyboard is look like a typewriter. We can type the text with the help of the keyboard. Keyboard has many keys for example: alphabet keys (a to z), numeric keys (0 to 9), arrow keys (left, right, up, down), adjustment or modifier keys (shift, alt, ctrl), escape keys, enter keys etc. A standard keyboard has 104-105 keys.



✓ **Mouse:** Mouse is also an input device. Mouse is a clicking machine so it is called pointer. Mouse is a hand –held machine. Mouse has three buttons on the top. 1. Left Click 2. Right Click 3. Scroll Key.

1. **Left Click 2. Right Click 3. Scroll Key.**

Full form of Mouse

M=Manually
O=Operating
U=Utility
S=Selected
E=Equipment

Functions of mouse:

- Move the mouse cursor- the primary function is to move the mouse pointer on the screen.
- Open or execute a program- Once you've moved the pointer to an icon, folder, or other object clicking or double clicking that object opens the document or executes the program.

✓ **Scanner:** Scanner is also an input device. It looks like a photo state machine. It is used to make the soft copy.

✓ **Microphone:** Receives sound generated by a user or other source and sends that sound to a computer.

OMR

(Optical Mark Recognition)

- **CPU (central processing unit):** It is the central part of the input and output devices. This is the actual area where the actual processing of data is done. CPU takes data from the input devices process it and transfer it taken output devices. All these processing of CPU is done with the help of its following components.
  - **Arithmetic and Logical Unit (ALU):** This part of CPU is responsible from carrying out the arithmetic operations and logical operations. Arithmetic operations only on the data available with in memory.

- **Control Unit:** This part of CPU is responsible for controlling everything happen on the computer. It is stored within the main memory.

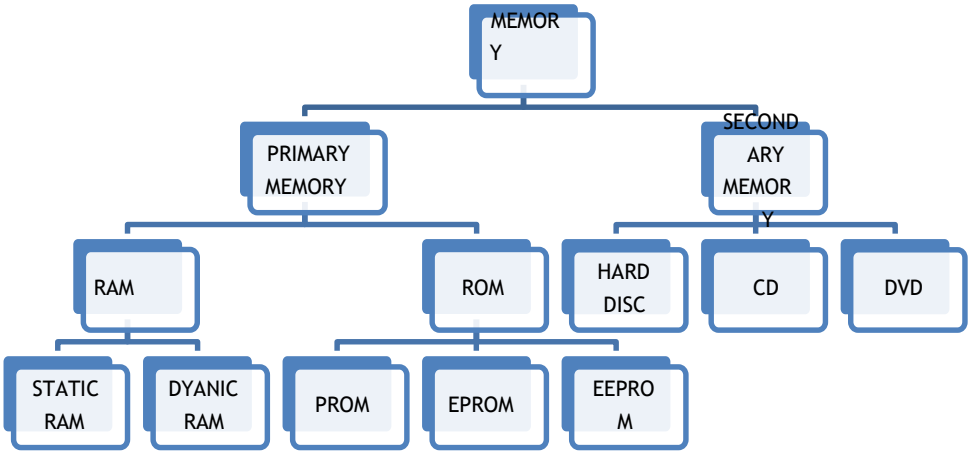
Microprocessor & Motherboard

CPU

Memory And Its Types:

Memory : Memory is also a part of CPU. CPU keeps data before processing and after processing. These are RAM or ROM.

In fact, inside the computer, there are different storage areas where it keeps data or information permanently or temporarily while working. This storage area is known as the Memory of the computer**.**



- **Primary Memory:** This is the main memory of the computer. CPU can directly read or write on this memory. It is fixed on the motherboard of the computer. Primary memory is further divided in two types:
  - **RAM(Random Access Memory)**
  - **ROM(Read Only Memory)**
  - **RAM (Random Access Memory):** RAM is a temporary memory. The information stored in this memory is lost as the power supply to the computer is turned off. That's why it is also called Volatile Memory. It stores the data and instruction given by the user and also the results produced by the computer temporarily.

RAM

Integrated RAM chips are available in two forms:

- **SRAM(Static RAM)**
- **DRAM(Dynamic RAM)**
- **SRAM:** Static random access memory uses multiple transistors, typically four to six, for each memory cell but doesn't have a capacitor in each cell.
- **DRAM:** Dynamic random access memory has memory cells with a paired transistor and capacitor requiring constant refreshing.

- **ROM (Read only Memory):**

  Information stored in ROM is permanent in nature i.e. it holds the data even if the system is switched off. It holds the starting instructions for the computer. ROM cannot be overwritten by the computer. It is also called Non-Volatile Memory.

There are three parts of Rom

- **Programmable Read Only Memory (PROM) :-** A programmable read-only memory is a form of digital memory where the setting of each bit is locked by a fuse or antifuse. It is one type of ROM. The data in them are permanent and cannot be changed.
- **Erasable Programmable Read Only Memory (EPROM)**:- Erasable Programmable Read Only Memory is ROM which can be read from and reprogrammed. This type of ROM can only be reprogrammed using a special type of ultra-violet light, and therefore is only reprogrammed by manufacturers.
- **Electronically Erasable Programmable Read Only Memory (EEPROM):-** EEPROM (pronounce as "E-E-PROM") stands for Electrically Erasable Programmable Read-Only Memory. It is a non-volatile ROM chip which used for storing a small amount of data in computers or some other electronic devices. Through EEPROM, an individual byte of data can erase and reprogrammed entirety.

Secondary Memory:

This memory is permanent in nature. It is used to store the different programs and the information permanently (which were temporarily stored in RAM). It holds the information till we erase it.

Memory Units:

Data in the computer memory is represented by the two digits 0 and 1.These two digits are called Binary Digits or Bits. A bit is the smallest unit of computer memory.

- **Bits=0,1**
- **4bit= 1 Nibbel**
- **1 Byte =8 bits**
- **1 KB (kilobyte) =1024 Bytes**
- **1 MB (megabyte) =1024 KB**
- **1 GB (Gigabyte) =1024 MB**
- **1 TB (Terabyte) = 1024 GB**

Storage devices :

Hard Disc, Compact Disc, DVD, Pen Drive, Flash Drive, etc.

- **Hard Disc:** This is the main storage device of the computer which is fixed inside the CPU box. Its storage capacity is very high that varies from 200 GB to 3 TB. As it is fixed inside the CPU box, it is not easy to move the hard disc from one computer to another.

A hard disc contains a number of metallic discs which are called platters. Information is recorded on the surface of the platters in a series of concentric circles. These circles are called Tracks.

- **Compact Disc (CD):** It is a thin plastic disc coated with metal. Computer can read and write data stored on it. This is an optical storage device with a storage capacity of up to 700 MB and it can store varieties of data like pictures, sounds, movies, texts, etc.

- **DVD:** DVD stands for Digital Versatile Disc. It is an optical storage device which reads data faster than a CD**.**

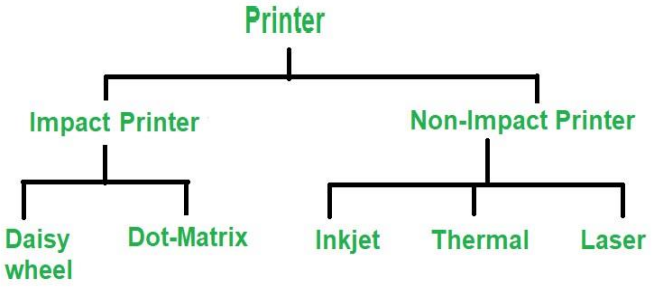
- **Flash Drive**: It is an electronic memory device popularly known as pen drive in which data can be stored permanently and erased when not needed. It is a portable storage device that can be easily connected and removed from the CPU to store data in it. Its capacity can vary from 2 GB to 256 GB.

Hard disk, CD & DVD and flash drive :

- **Output Devices:** These devices take the data from the processor and show the result on the screen. It personal computer system, display screen, printer and speaker are output devices

  - **Monitor:** Monitor is an output device. Its look like a TV. We can see the result of the document on the monitor screen. We can see the image and pictures and video on the screen.

- **Printer:** Printer is also an output device. It is used to make hard copy of the print out document. There are two types of Printer.



Impact and Non-Impact Printer

the

- **Impact Printers:** An Impact printer is a type of printer that operates by striking a metal or plastic head against an ink ribbon. The ink ribbon is pressed against the paper, marking the page with the appropriate character, dot, line or symbol. Following are some examples of impact printers.
  - ✓ **Dot- Matrix Printer :-**Dot matrix printers work by striking a grid of pins against a ribbon. Different characters are printed by using different pin combinations.

  - ✓ **Daisy wheel printer:** The printer uses a metal or plastic disk containing each of the letters, numbers, and other characters it supports. When printing, the printer rotates the disk to each character and then using a hammer strike each character into an ink ribbon to create the character on paper.


Daisy Wheel Printer

- **Non-impact printers**: Non-impact printers are now most common, as they are faster and quieter than impact printers. Non-impact printers form characters and images without direct physical contact between the printing mechanism and the paper. Non-impact printers use a cartridge filled with toner or liquid ink, which allows them to produce fine-quality images quickly and quietly.
  - ✓ **Inkjet printer:** Inkjet printers are similar to dot matrix printers in that the images they create are composed of dots. However, the dots on an inkjet printer are shot onto the page rather than using a ribbon and pins. Furthermore, an inkjet printers dots are much smaller, and their print speed is faster.

- ✓ **Laser printer:** This printer utilizes laser technology to print images on the paper. Laser printers are often used for corporate, school, and other environments that require print jobs to be completed quickly and in large quantities. The HP LaserJet printer is a good example of a laser printer.

- ✓ **Thermal printer:** A thermal printer is non- impact printer or electrothermal printer. These printers are commonly used in fax machines; and although they are inexpensive and print relatively fast.

- ▪ **Speaker:** Speaker is also an output device. It is used to improve the sound quality of the music system. There are many varieties of speakers in the market but it depends on their cost and performance.

Software

Software:-Software is a set of instructions that process the information. A set of instructions is called programmed. Without software, the computer cannot work. Without software, the hardware would be useless.

There are two types of software :

- **Application software:** Application software is a set of program designed for specific uses such as spreadsheet, word processer etc. Normally, to use an application program, we read the information into the computer memory, run the program and then create a file, when we finished our work, then we have to need the save program. If we do not save our work and shut down the computer that is we have lost all the work. It is erased from the memory. Some of application software is Photoshop. Page maker, Ms. Office etc.

- **System software:** System software program coordinate the operations of the various hardware components of the computer. The operating or system software tells the users to that how operate the computer. This is the interface between the user and computer. Most common system software is dos, Os, UNIX. It includes the operating system and language translators.

Number System

Introduction:- Number system plays an important role in the design, organization and understanding of computers. Computers are based in a number systems different form our decimal number system. This is called binary in which digit '1' and digit '0'.

- **Binary number system:-** Binary (or base-2) a numeric system that only uses two digits — 0 and 1. Computers operate in binary, meaning they store data and perform calculations using only zeros and ones. A single binary digit can only represent True (1) or False (0) 0, 1 Base =2

  Ex= (1010)2

- **Octal number system: -** In the octal number system, the base is 8; it will have digits from 0 to 7. This system is necessary because microcomputers use this system for direct input/output operations. 0,1,2,3,4,5,6,7 Base=8 Ex=(257)8.

- **Decimal number system: -** In the decimal number system, there are ten digits and the system is based in 'ten'. 0,1,2,3,4,5,6,7,8,9 Base=10 exp= (389)10

- **Hexadecimal: -** The Hexadecimal number system means a system based on 16 digits. The hexadecimal system has a base of 16 digits to represent all numbers. 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F. Base=16

  Ex= (4B8E) 16.

Number Conversion

Number Conversion:-The number system is a form of expressing the numbers. In number system conversion, we will study to convert a number of one base, to a number of another base. There are a variety of different number systems such as binary numbers, decimal numbers, hexadecimal numbers, octal numbers, which can be exercised.

Here, the following number system conversion methods are explained.

- **Binary to Decimal Number System**
- **Decimal to Binary Number System**
- **Octal to Binary Number System**
- **Binary to Octal Number System**
- **Binary to Hexadecimal Number System**
- **Hexadecimal to Binary Number System**

Other Base System to Decimal Conversion:

- **Decimal Number – Base 10 – N_{10}**
- **Binary Number – Base 2 – N_2**
- **Octal Number – Base 8 – N_8**
- **Hexadecimal Number – Base 16 – N_{16}**

Decimal to Binary Number:

Operation	Output	Remainder
25 ÷ 2	12	1(MSB)
12 ÷ 2 `	6	0
6 ÷ 2	3	0
3 ÷ 2	1	1
1 ÷ 2	0	1(LSB)

Therefore, from the above table, we can write,

$(25)_{10} = (11001)_2$

Note: Here MSB stands for a Most significant bit and LSB stands for a least significant bit.

Decimal to Octal Number:

Example 2: Convert 128_{10} to octal number.

Solution: Let us represent the conversion in tabular form

Operation	Output	Remainder
128/8	16	0(MSB)
16 /8	2	0
2/8	0	2 (LSB)

the equivalent octal number is 200_8

Decimal to Hexadecimal:

Convert 128_{10} to hex.

Operation	Output	Remainder
128/16	8	0(MSB)
8/16	0	8(LSB)

the equivalent hexadecimal number is 80_{16}

Other Base System to Decimal Conversion:

Binary to Decimal:

Convert $(1101)_2$ into decimal number.

Now, multiplying each digit from MSB

to LSB with reducing the power of the base number 2.

$1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$

$= 8 + 4 + 0 + 1$

= 13

Therefore, $(1101)_2 = (13)_{10}$

Octal to Decimal:

Convert 22_8 to decimal number.

Solution: Given, 22_8

$2 \times 8^1 + 2 \times 8^0$

$= 16 + 2$

$= 18$

Therefore, $22_8 = 18_{10}$

Hexadecimal to Decimal:

Convert 121_{16} to decimal number.

Solution: $1 \times 16^2 + 2 \times 16^1 + 1 \times 16^0$

$= 16 \times 16 + 2 \times 16 + 1 \times 1 = 289$

Therefore, $121_{16} = 289_{10}$

Hexadecimal to Binary Shortcut Method

Hexadecimal Number	Binary
0	0000
1	0001

2	**0010**
3	**0011**
4	**0100**
5	**1101**
6	**0110**
7	**0111**
8	**1000**
9	**1001**
A	**1010**
B	**1011**
C	**1100**
D	**1101**
E	**1110**
F	**1111**

Octal to Binary Shortcut Method:

Octal Number	Binary
0	**000**
1	**001**
2	**010**
3	**011**
4	**100**

5	**101**
6	**110**
7	**111**

Convert $(89)_{16}$ into a binary number.

Solution: From the table, we can get the binary value of 8 and 9, hexadecimal base numbers.

8 = 1000 and 9 = 1001

Therefore, $(89)_{16} = (10001001)_2$

Convert $(214)_8$ into a binary number.

Solution: From the table, we know,

2 → 010

1 → 001

4 → 100

Therefore,$(214)_8 = (010001100)_2$

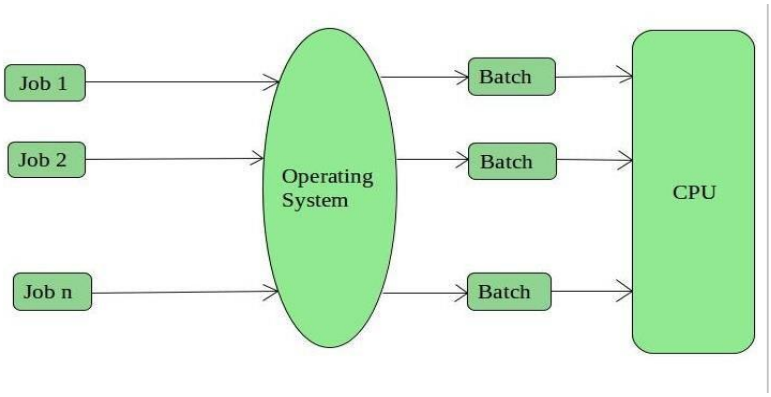
Operating System

Operating System:- An operating system or OS is a software program that enables the computer hardware to communicate and operate with the computer software. It is interface between the user and the computer. Without a computer operating system, a computer and software programs would be useless. An example of Microsoft Windows XP, a popular operating system.

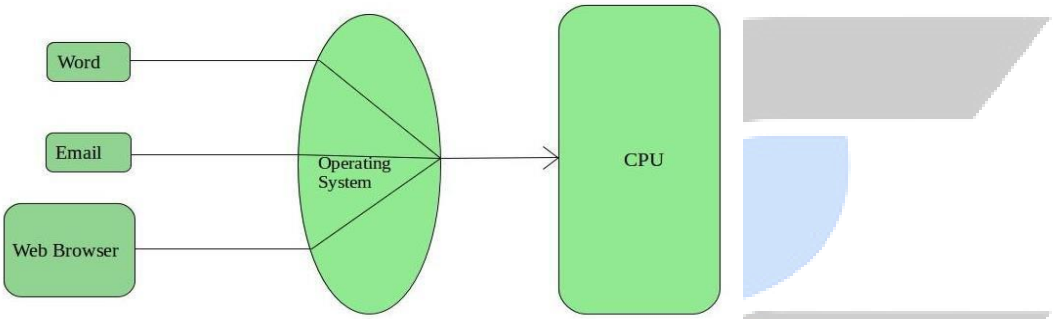
Types of Operating Systems: Some of the widely used operating systems are as follows

- **Batch Operating System :-** The First operating system of the second-generation computer is the batch operating system. Batch operating system took the input on the punch card. Each punch card had the different form of data. Batch operating system takes similar jobs having same requirement and group them into batches. System executed the jobs one

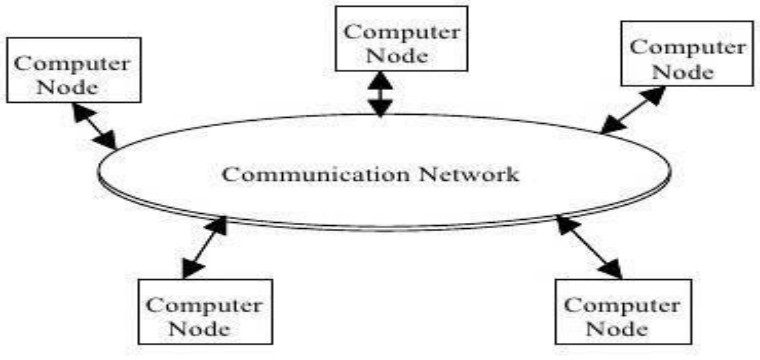
by one in batch. When one job from the batch executed, then the second job has taken from it.



- **Time sharing operating system:** A time sharing operating system is that in which each task is given some time to execute and all tasks are given time so that all processes run seamlessly without any problem. Suppose there are many users attached to a single system then each user has given time of CPU. No user can feel to have trouble in using the system.

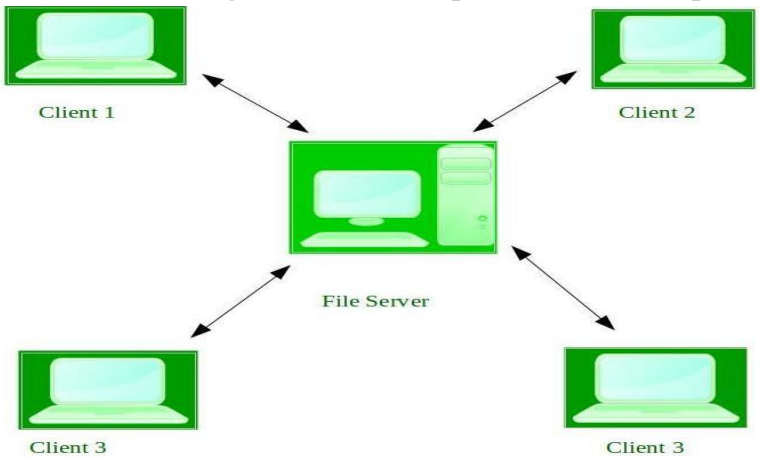


- **Distributed Operating System:** A distributed system is the collection of a computers that are connected using a communication network and they communicate with each other by passing messages. The different processors have their own local memory. They use a distribution middleware. They help in sharing different resources and capabilities to provide users with a single network. Example: WWW, email.



Architecture of a Distributed System

- **Network operating System:** A Network Operating System runs on a server and provides the server the capability to manage data, users, groups, security, applications, and other networking functions. The primary purpose of the network operating system is to allow shared file and printer access among multiple computers in a network.



- **Real-Time Operating System:** These types of OSs serves the real-time systems. The time interval required to process and respond to inputs is very small. Real-time systems are used when there are time requirements are very strict like air traffic control systems, robots etc.

Functions of operating system.

- **Booting:-**Booting is a process of starting the computer operating system starts the computer to work. It checks the computer and makes it ready to work.
- **Two types of booting:-**
- **Warm booting:-** When CTRL, ALT and DEL keys are press simultaneously, and then warm booting is performed. The first step of booting process (memory test 0 is skipped, when this booting is applied. Reset button can also be used for this type of booting. (restart of computer)
- **Cold booting:-** When the power is switched OFF or the computer system OFF or the computer system is shut down and again ON, then cold booting is performed. All steps of booting are performed in this type of booting process
- **Printing controlling :** Operating system also controls printing function. If a user issues two print commands at a time, it does not mix data of these files and prints them separately.

- **Memory Management:-** Different programs and data execute in memory at one time. if there is no operating system, the programs may mix with each other. The system will not work properly.

- **Loading and Execution:** A program is loaded in the memory before it can be executed. Operating system provides the facility to load programs in memory easily and then execute it.

- **Data security:** Data is an important part of computer system. The operating system protects the data stored on the computer from illegal use, modification or deletion.

- **Disk Management :** Operating system manages the disk space. It manages the stored files and folders in a proper way.

- **Process Management :** CPU can perform one task at one time. if there are many tasks, operating system decides which task should get the CPU.

- **Device Controlling :** Operating system also controls all devices attached to computer. The hardware devices are controlled with the help of small software called device drivers.

GUI Operating System:- GUI stands for Graphical User Interface. This type of operating system provide graphical interface to the user to work on it easily. This type of operating system is gives friendly environment. The user can work on it by clicking the icons and open the file etc without write any command. Your Microsoft Windows and Mac OS is the great example of graphical user interface.

Window and its Featurs:

Windows is a graphical operating system developed by Microsoft. It allows users to view and store files, run the software, play games, watch videos, and provides a way to connect to the internet. It was released for both home computing and professional works.

Microsoft introduced the first version as 1.0

It was released for both home computing and professional functions of Windows on 10 November 1983. Later, it was released on many versions of Windows as well as the current version, Windows.

Features of Windows
Microsoft Windows includes a lot of features to help users. Some of its excellent features are as follows:

Control Panel: Windows provides a Control Panel feature that includes many tools to configure and manage the resources on their computer. For example, users can change settings for audio, video, printers, mouse, keyboard, network connections, date and time, power saving options, user accounts, installed applications, etc.

1. **File Explorer:** It is also known as Windows Explorer, which displays your files and folders on the computer. It allows users to browse the data on the hard drive, SSD and other inserted removable disks like pen drives and CDs, and you can manage the content according to the requirements such as delete, rename, search, and transfer the data.
2. **Internet browser:** As the internet browser is very important to search for anything, view pages, online shopping, play games, watch videos, etc. Windows come with a pre-installed internet browser.
3. **Microsoft Paint:** Since November 1985, Microsoft Windows comes with pre-installed Microsoft Paint. It is a simple software to create, view, and edit an image. It offers several tools to draw an image, crop, resize, and save an image with a different file extension.

4. **Taskba**r: Windows comes with a taskbar that displays currently opened programs, it also allows users to access any specific programs. Additionally, it includes the notification area on the right side that shows date and time, battery, network, volume, and other background running applications.

5. **Start menu**: Microsoft Windows contains a start menu to the left side of the taskbar. It displays programs and utilities that are installed on the computer. It can be simply opened by clicking on the Start menu button or pressing the start key on the keyboard.
6. **Task Manage**r**:** Windows includes the task manager feature that provides detail of the running applications or programs on the computer. You can also check how much of the system resources, such as RAM, CPU, disk I/O, are being used by each of the applications.
7. **Disk Cleanup:** It is used to free up disk space with the help of deleting temporary or unnecessary files. It also helps to enhance the performance of the computer, and boost storage space to download the programs and documents.

Components of Window:

Desktop:- The desktop is the primary user interface of a computer. ... It includes the desktop background (or wallpaper) and icons of files and folders you may have saved to the desktop. In Windows, the desktop includes a task bar, which is located at the bottom of the screen by default.

Icon: An icon is a small graphical representation of a program, feature, or file. When you click or double-click an icon, the associated file or program opens or an action is performed. For example, if you were to double-click My Computer icon, it would open Windows Explorer.

Start Button: The Start button is a small button that displays the Windows logo and is always displayed at the left end of the Taskbar in Windows 10. To display the Start menu or the Start screen within Windows 10, click the Start button.

Managing files and folders: File management is organizing and keeping track of files and folders, helping you stay organized, so information is easily located. A folder is a container for storing programs and files. You can also search for a file when you cannot remember where you stored it. A folder can hold different types of files, such as text, spreadsheets, and presentations.
.

Managing files and folders: File management is organizing and keeping track of files and folders, helping you stay organized, so information is easily located. A folder is a container for storing programs and files. You can also search for a file when you cannot remember where you stored it. A folder can hold different types of files, such as text, spreadsheets, and presentations.

Copying and Moving Files and Folders :

Sometimes you will need to move a file from one folder to another, or copy a file from one folder to another.

Copy a File or Folder

- Open the drive or folder containing the file or folder you want to copy.
- Select the files or folders you want to copy
- Click the Organize button on the toolbar, and then click Copy.

◦ Display the destination folder where you want to copy the files or folder.
◦ Click the Organize button on the toolbar, and then click Paste.

Deleting and Restoring Files and Folders:

You can delete the files or remove them from the disk. If you delete a file or folder from the desktop or from the hard disk, it goes into the Recycle Bin. The Recycle Bin, located on your desktop is a temporary storage area for deleted files.

- **Delete Files and Folders**

◦ Select the files and folders you want to delete.
◦ Click the Organize button on the toolbar, and then click Delete.
◦ Click yes to confirm the deletion and place the items in the Recycle Bin.
◦ On the desktop, right-click the Recycle Bin icon, and then click Empty Recycle Bin.
◦ Your computer permanently removes the items.

Restore Files and Folders :

◦ **Select the item or items you want to restore.**
◦ **Click the Restore this item or Restore all items button on the toolbar.**
◦ **Click yes to confirm the restore or click No to cancel it.**

Create a Simple Search by Type :

◦ Start the default search application using any of the following:
◦ Press Windows logo+F.
◦ Click in the Search box or press Ctrl+F.
◦ A search menu appears. Disregard the menu for a simple search.
◦ Type a word or part of a word**.**

Personalizing window:

- In all other editions of Windows 7, you can easily personalize your computer by simply right-clicking on the desktop and selecting Personalize. This gives you a wide range of options to change, including themes, background, sounds, screensaver, mouse pointers, and desktop icons.

Screen Saver: A screensaver (or screen saver) is a computer program that blanks the screen or fills it with moving images or patterns when the computer has been idle for a long time.

Control Panel:- Control panel is a component that provides the ability to view and change the system setting. It consists a set of applets that include adding or removing hardware and software, controlling user a account, changing accessibility options and accessing network settings. This includes keyboard and mouse function, passwords and users, network settings, power management, desktop backgrounds, sounds, hardware, program installation and removal etc.

- **Date and Time:** The Date and Time Control Panel applet is used to configure the system time and date.

- **Desktop Gadgets:** The Desktop Gadgets Control Panel applet is used to add an installed Windows gadget to your desktop. The Desktop Gadgets applet can also be used to uninstall a gadget.

- **Devices and Printers:** The Devices and Printers Control Panel applet is used to install, manage and view information about devices and printers connected to your computer.

- **Display:** The Display Control Panel applet is used to adjust display settings like screen resolution, multiple monitor arrangement, and text size.

- **Fonts:** The Fonts Control Panel applet is used to add, remove, and configure the fonts available to Windows and the other programs on your computer.

- **Internet Options:** The Internet Options Control Panel applet opens the Internet Properties window for the current version of Internet Explorer installed on your computer.

- **Keyboard & Mouse:** The Keyboard Control Panel applet is used to make keyboard changes character. The Mouse Control Panel applet is used to make mouse changes like doubleclicks speed, pointer speed and visibility, button and wheel configuration, and more.

- **Printers:** The Printers Control Panel applet is used to add, remove and manage the printers installed in Windows.

- **Programs and Features:** The Programs and Features Control Panel applet is used to uninstall, change, or repair an installed program. Programs and Features can also be used to view installed Windows Updates or turn optional Windows features on or off.

- **Sounds and Audio Devices:** The Sounds and Audio Devices Control Panel applet is used to manage sound, voice, and other audio settings in Windows.

- **Troubleshooting:** The Troubleshooting Control Panel applet is a centralized place to access troubleshooting wizards that can help fix problems with software, sound playback, network and Internet connections, display problems, and more.

Window accessories:-

Window Accessories Group is a very important part of the window, very important tools are available inside Window Accessories, which we can use according to our need. Inside the Window Accessories Group, a list of many facilities is displayed so that we can do Simple Type.

Calculator:-We use this tool available in Window Accessories to do arithmetic and scientific calculations. To run the calculator, a normal calculator is displayed on the screen, which we run with the help of a mouse so that we can do Mathematical Sums very easily. This is an important tool of our Windows

Start button→ All program→ Window accessories→ calculator

NotePad:-NotePad is the Window's Text Editor Program, we use it to create a text file in the window, the extension (.txt) of the file created inside it is that there is some limit to the text in this text editor, in this we are in some limited size. This is a very important tool for Windows accessories. Click Here to more Info

Start button→ All programs→ Window accessories→ notepad

Word Pad:-Word Pad is also called a Word Processor, it is also a text editor program, it is an advanced form of note pad. You can change the size of the font in it, we can fix the date and time, it is an important tool of Window Accessories. Click Here to More Info for Wordpad

Start button→ All program→ Window accessories→ word pad

Paint:-The Paint Tool present in the Window Accessories Group is very important, with the help of this tool we can make pictures, sketches and maps etc. In this, with the help of many tools, we can paint a good type.

Start button→ All program→ Window accessories→ paint

Disk cleanup:-Disk cleanup is one of the most important tools of window accessories, with the help of this we can clean many things like junk files, cookies from our PC, due to this the performance of our computer becomes faster.

Start button→ All program→ Window accessories→ System tool→ disk cleanup

Sticky Notes:-With Sticky Notes, you can create notes, type or add a picture, add text formatting, stick them to the desktop, move them around there freely, close them to the Notes list,

Compression utilities:-A compression program or compression utility is a software program that compresses and decompresses various file types.Most operating systems include tools for compressing and uncompressing files. For example, latest versions of Microsoft Windows include a compression utility for creating and extracting .zip files and Linux has tools for both .tar.gz and .zip. Other compressed files, like .7z and .rar, require a third-party compression utility to be installed, such as the ones listed below.

Example of compression utilities

- 7-Zip
- Bzip
- PKZIP
- WinAce
- WinZip
- WinRAR

- **WinRAR:-** WinRAR automatically recognizes and selects the best compression method. The special compression algorithm compresses multimedia files, executables and object libraries particularly well. WinRAR allows you to split archives into separate volumes easily, making it possible to save them on several disks.
- **WinZip:-** WinZip is a Windows program that lets you archive and compress files so that you can store or distribute them more efficiently. WinZip is a more capable and easier-to-use Windows equivalent of two earlier programs commonly used in the DOS operating system, PKZIP and PKUNZIP.

What Is Multimedia?

Multimedia is the use of a computer to present and combine text, graphics, audio, and video with links and tools that let the user navigate, interact, create, and communicate.

Elements of Multimedia

- **Text** :Text is the basis for word processing programs and is still the fundamental information used in many multimedia programs. A multimedia programmer,you can choose what font to display text in ,how big (or small) it should be ,and what color it should be displayed in .

• **Audio**: Sound The integration of audio sound into a multimedia application can provide the user with information not possible through any other method of communication . Audio sound can also reinforce the user's understanding of information presented in another type of media.
Different format
MP3. MP3 (MPEG-1 Audio Layer III) is the most popular of the lossy formats. ...
AAC. Advanced Audio Coding, or AAC files (also known as MPEG-4 AAC), take up very little space and are good for streaming, especially over mobile devices. ...
WAV. ...

• **lmages** : Images are an important part of multimedia because humans are visually oriented Images have a number of formats and can be created in a number of different ways.Different format

Abbreviation	File format	File extension(s)
JPEG	Joint Photographic Expert Group image	.jpg , .jpeg , .jfif , .pjpeg , .pjp
PNG	Portable Network Graphics	.png
SVG	Scalable Vector Graphics	.svg
WebP	Web Picture format	.webp

• **Video**: video ,such as the images portrayed in a television ,can add even more to a multimedia application. video may sound like an ideal way to add a powerful message to a multimedia application. The quality you would expect after watching television. video is still in its beginning stages on PCs ,and it is limited in resolution and size. Different format
MP4. MP4 (MPEG-4 Part 14) is the most common type of video file format. ...
MOV. MOV (QuickTime Film) stores high-quality video, audio and effects, but these files tend to be quite large. ...
WMV. ...
AVI. ...

External devices

An external storage device can be removable or non-removable, temporary or permanent, and accessible over a wired or wireless network. External storage enables users to store data separately from a computer's main or primary storage and memory at a relatively low cost.

Pen drive: Pen drive is a external storage device. The pen drive has a USB (Universal Serial Bus) port so that you can connect the pen drive to any laptop or desktop computer. Due to the USB port in the pen drive, you can connect and disconnect it from any device. USB pen drive is capable of storing more data than a compact disc and is also smaller in size than a pen drive compact disc.

Copying files from computer to pen drive:

Insert the USB or flash drive into the USB port on the computer. From your computer, select the folder you want to transfer. If you wish to select multiple folders, hold down the Control or Command key as you click to select items. When folders are selected, right-click and select "Copy"

Copying files from pen drive to computer:

Insert the USB or flash drive into the USB port on the computer. From pen drive, select the folder you want to transfer. If you wish to select multiple folders, hold down the Control or Command key as you click to select items. When folders are selected, right-click and select "Copy"

USB: Universal serial bus, USB is a plug and play interface that allows a computer to communicate with peripheral and other devices. USB-connected devices cover a broad range; anything from keyboards and mice to music players and flash drives.

DVDs are widely used for storing and viewing movies and other data. The picture of the Matrix DVD movie disc is an example of a DVD movie.

Compact discs: Compact discs store data to be retrieved or executed at a later date. CDs can store software programs to install onto your computer. They save files for backup or transfer to another computer and hold music to play in a CD player.

Burning a CD/DVD in computer

When you copy music, pictures, and videos from your PC to a blank CD or DVD, it's called "burning." When you copy music, pictures, and videos from a CD or DVD to your PC, it's called "ripping." You can use Windows Media Player to do both.

Read and Write in CD?

CD–Read Writable (CD-RW) refers to an optical CD that may be written and rewritten multiple times. CD-RW allows for data erasing during each rewritable session.

Things to know before Buying a computer like processor, operating system etc.

1.Processor: The computer's processor like a brain – a computer with a strong processor will boot up in a flash, run programs no problem, and won't keep you waiting. basic terms, processor specs are labeled in terms of the number of cores, and the speed (in GHz or gigahertz). The speed of the processor chip indicates how much data can be processed in a specific amount of time – the bigger the number, the better. The cores act as multipliers. For example, a 2GHz processor with a single-core is four times slower than a four-core 2GHz processor.

2. RAM (Computer Memory)

Essentially, the more rams you have, the more browsers and applications you can open. 4Gb is the most basic nowadays. 8GB is the sweet spot for most people. If you are a gamer, photo or video editor, or planning to do CAD/CAM work, you need at least 16GB of Ram. Make sure you get windows vista 64bit as your operating system.

3. Hard Drive

This is the next piece you should tackle. Computers today usually come with 250GB and 750GB of space in the hard drive. As more people are storing their information online on cloud storage, you may want to rethink of buying a huge hard drive space.

4. Graphics

Now all computers come with some form of graphics built in. But my recommendation is to go with something a little better possibly from NVIDIA or AMD. They make your computer resolution better. AMD cards are good for mining while NVidia is good for Adobe programs.

5. Anti-Virus Software

The last thing to do with the actual computer is a good virus and spy ware package. Don't be under any illusion this is possibly the most important part of protecting your computer. It will get attacked at some point be prepared when it does.

6. Operating System

The next thing to consider when buying a computer is the operating system. The Windows operating system always is sold in different types. The more advanced and expensive operating system enjoys more features. The Windows 10 operating system includes the Home, Pro, Enterprise and Education. Each of them has different features so make sure do some researches before purchasing.

7.Price

Another factor to consider when purchasing a computer is the price. If you don't have enough budget to buy an expensive one, you should take the price into consideration and choose the affordable one.

What are peripheral devices in computer?

Peripheral device, also known as peripheral, computer peripheral, input-output device, or input/output device, any of various devices (including sensors) used to enter information and instructions into a computer for storage or processing and to deliver the processed data to a human operator.

Solution for common computer issues:

- **General Slowdown:-**One of the most common problems users have with their computer is that it is "running slow." This can be caused by many different things. However, typically it is referring to the time it takes to turn on the PC, open programs, or do just about

anything. In some extreme cases, this can even mean input lag from your keyboard to what appears on the screen. This issue can be incredibly frustrating, because it can affect multiple programs or areas on your computer and seriously reduce productivity.

Solution: The main reason for general PC slowdown is a lack of—or the improper distribution of—hardware resources. this means is that specific programs or processes are using too much of your RAM, hard drive, or CPU.Just running your operating system takes a base amount of resources, so if you have a pesky program using too much of your computer, it can struggle to run the OS.To do this, right-click your taskbar and click Task Manager. On the top of the Task Manager window, you will see a tab that reads "Performance." You can click this tab to see how much of your computer resources are being used at one time.

- **PC Will Not Turn On:-**Pressing the power button on your computer and having nothing happen. power issues do not necessarily mean the entire PC is broken or that data has been lost.

Solution: Desktop computers will not power unless the power switch in the back is turned on, and the button in the front is pressed. This is always the first thing you should check when experiencing power issues on a desktop PC. If this does not solve your problem, you can carefully open your case when the computer is powered off to see if your power supply is connected properly to your other computer components. It is safe to reseat connections and remove any excess dust or debris in the case. However, it is not recommended for average users to remove or change internal power supply connections.

- **Peripherals Not Working:-**Keyboards and mice see a tremendous amount of daily use, so it is not uncommon for them to fail on occasion. Other devices such as microphones or presentation-based remotes can have complicated setup processes that can create potential issues later down the road. When any of these devices fail to work properly, they can create costly and annoying downtime that is not ideal for any user.

Solution: When an external device is not working is its connection to the computer. Cables can easily break, or ports can be obstructed. Before getting into any more serious solutions, it is always best practice to try using different cables or connections on your machine to see if a device will begin working again.A quick way to see if you are having driver issues is to check Device Manager. This is an area of your settings you can get to by searching or right clicking your start menu. Once in Device Manager, you will see a list of all the hardware

connected to your computer. This means the device is detected by your computer but not working as intended.

There are two solutions you can try from here to get your device up and running again:

- First, you can right-click and update the drivers for the device. This will require a restart but can be a quick and easy way to implement this fix.
- If updating does not work, you can also try reinstalling the drivers. To do this, right-click the device again, but this time click "Uninstall Drivers" and then restart your PC. This removes the current drivers from your machine and then reinstalls the proper drivers once the computer restarts.

- **Audio Issues:-** Microphones can get accidentally muted, or audio sources can switch within different programs. Hardware can fail, but it is uncommon. sound issues can be resolved from within the operating system. However, there are multiple ways to access and change sound settings, so troubleshooting issues can be frustrating when waiting for a virtual meeting or video call to start.

Solution: Most keyboards, headsets, or microphones come with a dedicated mute button. When dealing with sound issues, it is always best practice to check these functions and buttons first. Accidental button or key presses can sometimes mute audio sources in programs or your entire PC audio.By right clicking your speaker icon, you can bring up your audio settings, which will show you a list of available audio devices. You can then test each one with the press of a button and ensure the proper device is selected for your PC.

Handling issues related to Printer

1. Paper Jams
Tearing the paper out can just make the problem worse or damage a part of the printer. When removing the paper we recommend referring to the troubleshooting section of the printers manual. The most common cause of a paper jam is misaligned paper. Be sure that you are squaring off the paper when you load it into the tray and that you are using the right kind and quality of paper for your printer.

2. Poor Print Quality
When it comes to smudges, faded type and poor image quality, there are a couple of issues that could be going on. Sometimes these problems are related to the print settings you have selected. First, check that you have the correct media selected and that the paper in the tray matches the type selected in the print driver. If that doesn't solve the problem you can take a look at the ink cartridges to make sure there isn't any damage to or issue with the cartridge. If smudges are the problem, try printing several sheets in black and white, which should do the trick.

3. Nothing is Printing

If you're standing in front of a printer that is not spitting out your documents, where should you start the troubleshooting process? First, if you have multiple known printers, make sure that you've selected the right one for the job. Second, be sure that your printer is still connected to the correct WiFi network, USB or Ethernet connection. An empty paper tray is often an issue as well. If none of these solve the problem, try shutting down the printer, waiting a few minutes, and then turning it back on. Lastly, if your printer is still not working, it could be an issue of a corrupted driver that needs to be reinstalled on your computer.

4. WiFi Printing Takes too Long

The truth of the matter is, while WiFi printing is oftentimes more convenient, it can be slower and present more problems. Slow print jobs on a WiFi connection could simply be a problem of printer placement. Make sure your WiFi router is close to your printer and that there aren't big objects obstructing your connection, and this should help increase throughput and performance. Sometimes printer speed and performance are impacted by the amount of network traffic. If it's possible, try manually switching the channel of your wireless router.

Handling issues related to scanner

1) Issues Fixed With the Oldest Tricks In the Book

Restarting your scanner can magically resolve issues you're having.For a scanner, the same logic can apply. Software may malfunction when it is overused, overloaded or otherwise interfered with.After you power down your device, wait a few minutes before you press the restart button. When you let your scanner rest in the off position for a couple of minutes, it'll have time to power off completely. Then, give your device time to power up before you try to use it again. Trying to use the device as it's powering up may slow it down or cause another error, so you want to give it time to turn back on before you give it any commands.

2) Improper Connection

If there is problem in scanner make sure everything is connected properly. Is your scanner connected to your computer? Is there a missing power supply connection that's required for the scanner to operate?

If possible, switch to a different USB or connection cable to see if the issue lies in the connector you're using. Another option is to change the USB ports you're using to see if a faulty port is the cause of your issues. As you unplug and replug your devices, it's also good to remove accessories. If you're using other ports to update your phone, stream visual via HDMI, etc., stop these other processes momentarily by disconnecting to see if your scanner works better.

3) Scanner Won't Scan

Sometimes, your device may not scan when you tell it to do so. There are a few things that can cause a scanner to not operate correctly. First, make sure your scanner is ready. Flatbed scanner users can clean off their glass and make sure the document is positioned correctly.

Sheet-fed scanner users look for a paper jam in their scanner and check to see if the document is in the feeder correctly.
Someone's hand reaching to remove jammed paper from a jam in a printer/scanner

4) An Update Or Reinstallation Is Required
Your scanner may not work properly because an update is required. Many scanners require occasional updates. A new software version can improve your device's security, enhance its features and keep it compatible with different applications.
Windows users should navigate to the Windows' icon, hit "Control Panel" and "System and Security." Under "Windows Update," check for possible updates and manually install any available releases. Next, open "Device Manager" on your computer. Under the "Printers" section, right click on the name of the printer you're using. If there's an option for "Update Driver," you'll want to select it.

5) Paper Problems
Another common issue users see with scanners is paper jams. When paper jams, there is likely an issue with the path the paper follows. Often, you'll have to physically remove the jammed paper to proceed. Look up your specific scanner's make and model online to get specific information about how you can open your device and remove the jammed paper. Again, it's also smart to check the paper type you're using to make sure it's compatible with your device.

COMMON PROJECTOR ISSUES

1. PROJECTOR NOT TURNING ON
There are a number of reasons that a projector may not be turning on. If your projector doesn't power on, try the following:

- Ensure the projector is properly plugged into a working outlet.
- Check the temperature lights to make sure the device hasn't overheated and shut down.
- If you are using a remote control to turn on the projector, check the batteries.
- Be sure all of the projector latches are closed.
- Try resetting the lamp timer.
- Ensure the projector is not in standby mode.

2. PROJECTOR IS OVERHEATING

It is natural for projectors to become hot as they are in use, but sometimes projectors overheat when they need cleaning, maintenance or better air circulation. If your projector is randomly shutting down or displaying a warning message, utilize the following tips to resolve the overheating:

- Clear the area around the projector.

- Ensure there is nothing blocking the projector vents.
- Clean the filter and vent of any dust.

3. LIGHT ON PROJECTOR IS BLINKING

There are countless makes and models of projectors –all with different parts and pieces– so it's generally best to refer to the owner's manual to determine the meaning of a blinking projector light. However, these are the most common reasons and solutions to blinking lights on your projector:

- **Power Light:** If the power button light is green or flashing green, the projector is likely on or warming up. If the power light is orange or flashing orange, the projector might be in standby mode or turning off.

- **Lamp Light**: If the lamp light is flashing orange or red, this usually means the lamp light is going to burn out soon or needs to be replaced.

- **Temperature Light:** If the temperature light is flashing orange or red, this typically means your projector is overheating or in need of cleaning. Be sure to clear any clutter from around the projector and to remove any items that may be blocking its vents.

4. PROJECTOR IMAGE IS DISCOLORED

Projector discoloration can occur for a number of reasons. Below are several of the most common reasons for discoloration and how to fix them.

  - Inspect the condition of your VGA cable. If you notice any bent prongs, the VGA cable likely needs to be replaced.
  - Optimize the display and color settings for the lighting in the classroom.
  - Check if your projector is in need of a lamp replacement.
- If none of the above suggestions help with the discoloration, the problem could be more serious. Contact a professional projector repair service to inspect the color wheel or polarizing plates.

Microsoft Word 2007

Word 2007 is the word processing software in the Microsoft 2007 Office suite that allows you to easily create a variety of professional-looking documents using features such as themes, styles, and Smart Art.

The Office Logo

The office logo offers options to make a new file, open file, save, save as file etc. On right side of office logo, there is quick access toolbar to quickly open, save, undo, redo file.

The Home Tab

The home tab the basic formatting tools found in Word 2007. You will find five sections, Clipboard, Font, Paragraph, Styles and Editing. Each section also contains an arrow in the bottom right corner which will open a window containing the options found in that section.

Clipboard

The Clipboard allows you to cut, copy, paste and format painter (copy formatting from one place to another and double click this button to apply formatting on multiple places).

Font

Font styles are bold, italic, underline, strikethrough, highlight and font type, font family, font size can be changed here.

Paragraph

The paragraph section provides icons for bullets, lists, **Text alignment**: Text alignment is a word processing software feature that allows users to horizontally align text on a page/document.
(left, right, center, justify), line spacing, indents and borders.

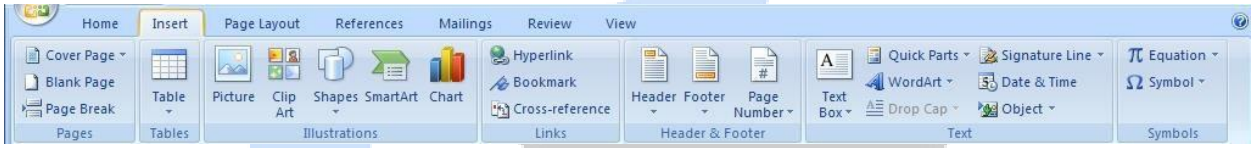
Styles

The styles section allows you to quickly change the formatting of a section of text by choosing one of the predefined styles.

Editing

The Editing section of the toolbar allows you to find, replace and select items. The select option gives you the ability to select all, select objects or select text with similar formatting.

Insert Tab



The insert tab has seven sections for inserting most types of objects. The sections are pages, tables, illustrations, links, header and footer, text and symbols.

Pages

The pages section is where you can go to insert a cover page, blank page or page break. The cover page drop down offers a selection of predefined cover pages for your document that have sections for title, date and author.

Table

The table section only has a drop down menu which offers a grid to create a new table, insert table, draw table, convert text to table for selected text, Excel spreadsheet, and some predefined "Quick Tables" that have formatting already

setup for you. When working on a table you will have two additional tabs along the top of the ribbon, the design and layout tabs.

Illustrations

The Illustrations section allows you to insert pictures, clipart is collection of pictures, shapes, Smart Art and charts.

Links

The links section provides options for inserting hyperlinks, bookmarks and cross-references. **Crossreferences** can link to figures, tables, equations, endnotes, footnotes, headers and numbered items. **Hyperlinks** are used to make link between the files. **Bookmark** is used to directly jump to specific location in document.

Header & Footer

Header is shown on top of page and **Footer** is shown on bottom of page. **Page number** is given in document using page number option.

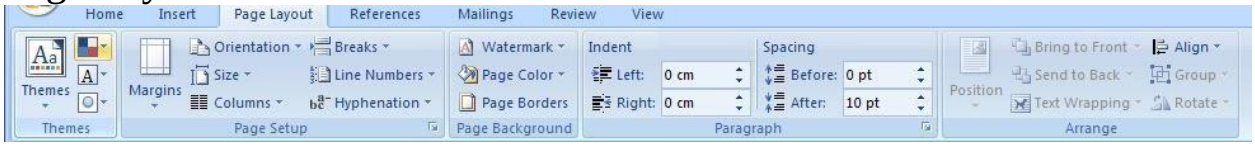
Text

Options in the text section include text box, drop cap, WordArt is decorative text and a number of predefined text blocks like a signature line the date and time and document properties like abstract, author and title.

Symbols

The last option in the insert toolbar is symbols. Here you can insert a large number of special characters and symbols.

Page Layout Tab



The page layout tab has five sections, Themes, Page Setup, Page Background, Paragraph, and Arrange.

Themes

The themes section provides a quick way to format your document. By choosing a theme you will have a set colour scheme, font combinations, and effects.

Page Setup

Page setup provides you with the tools to change margins, size, orientation, columns, breaks, line numbers and hyphenation in the document.

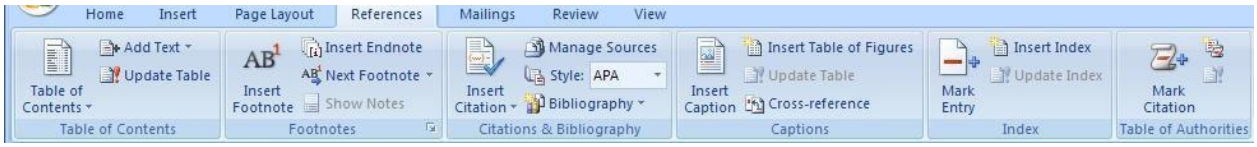
Page Background

The page background section allows you to change the background colour of the document, watermark and draft or confidential document or add borders to your document.

Paragraph

The paragraph section in the page layout tab allows changes to a paragraphs spacing and indentation.

References Tab



The references tab contains six sections, Table of Contents, Footnotes, Citations & Bibliography, Captions, Indexes and Table of Authorities.

Table of Contents

The table of contents section allows you to insert and modify the table of contents. You can insert automatic or manual table of contents and change what styles will be included in the table of contents, if any. You can also add text to the table and update the table of contents after adding or removing items from your document.

Footnotes

This section allows you to insert footnotes and endnotes and move through your existing footnotes quickly. Endnotes are inserted at end of document. Footnotes insert notes at bottom of page.

Citations & Bibliography

This section provides tools to insert citations, manage sources, citation style and bibliography.

Captions

Insert captions, table of figures, or cross-references in this section. Once you have created a table of figures you can also update the table at the click of a button.

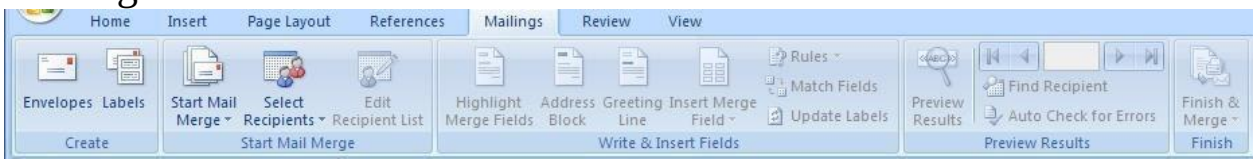
Index

This section allows you to create an index, update the index and mark and item for inclusion in the index.

Table of Authority

This section allows you to create a table of authorities, update the table and mark and citations for inclusion in the table of authorities.

Mailings Tab



The mailings tab contains five sections, create, start mail merge, write & insert fields, preview results and finish.

Create

The create section provides a window to create envelopes or labels. This is mostly for creating single envelopes, labels or a sheet of the same label.

Start Mail Merge

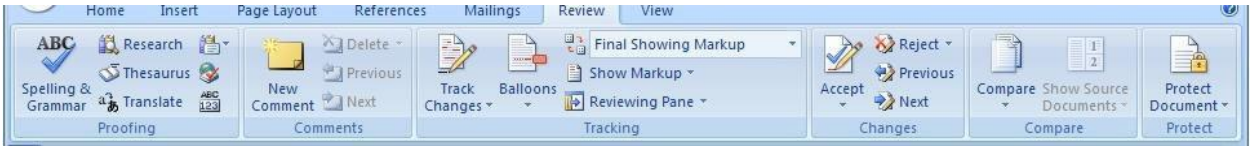
Mail Merge is most often used to print or email form letters to multiple recipients. The method most people will likely use to create a mail merge in Word 2007 is the step by step mail merge wizard found in the start mail merge drop down list.

How to Use Mail Merge in Microsoft Word

- ✓ In a blank Microsoft Word document, click on the Mailings tab, and in the Start Mail Merge group, click Start Mail Merge.
- ✓ Click Step-by-Step Mail Merge Wizard
- ✓ Select your document type. We will select **Letters**. Click Next: Starting document.
- ✓ Select recipients. We will create a new list, so select **Type a new list** and then click Create. Create a list by adding data in the New Address List dialog box and clicking OK
- ✓ Save the list.
- ✓ Selecting Edit recipient list opens up the Mail Merge Recipients dialog box, where you can edit the list and select or unselect records. Click OK to accept the list as is.
- ✓ Click Next: Write your letter.
- ✓ Write the letter and add custom fields.
- ✓ Click Address block to add the recipients' addresses at the top of the document.
- ✓ In the Insert Address Block dialog box, check or uncheck boxes and select options on the left until the address appears the way you want it to.
- ✓ Press Enter on your keyboard and click Greeting line... to enter a greeting
- ✓ In the Insert Greeting Line dialog box, choose the greeting line format by clicking the drop-down arrows and selecting the options of your choice, and then click OK.
- ✓ Note that the address block and greeting line are surrounded by chevrons (« »). Write a short letter and click Next: Preview your letters
- ✓ Preview your letter and click Next: Complete the merge.

- ✓ Click Print to print your letters or Edit individual letters to further personalize some or all of the letters.

Review Tab



The review tab offers six sections which include proofing, comments, tracking, and changes, compare and protect.

Proofing

The proofing section provides the standard spelling and grammar check, a thesaurus, word count, research tools. You will also find translation tools to help with single words or the whole document.

Comments

The comments section allows you to add comments to a document.

Tracking

You can track the changes made, who made them and show the changes in balloons off to the side. Be aware that you must turn this on before it will start to work. Tracking changes does not occur on every document automatically.

Changes

The changes section allows you to accept or reject changes made to the document and tracked using the track changes feature.

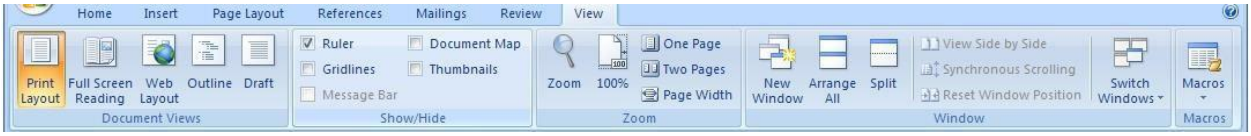
Compare

This section can be used to compare two versions or a document or help you combine two versions of a document. You can take the two documents and step through them combining them instead of redoing work that was already done.

Protect

The protect section gives you options to add a password and protect the document. You can restrict changes to formatting and editing or the whole document.

View Tab



The view tab offers five sections which include document views, show/hide, zoom, window and macros.

Document Views

The document views section switches you between print layout, full screen reading, web layout, outline and draft views. **Print layout** is the default view. **Full screen** view removes all but a couple of tools from the top of the screen and the rest of the screen is your document. **Web layout** will take away the empty space on either side of the document if there is any and fill the window as if it were a web page. **Outline view** changes the look of your document into an almost point form style which may help with reviewing main points. **Draft view** takes away most of your formatting and images and just shows the text.

Show/Hide

The show/hide section will toggle certain tools on or off the screen including rulers, gridlines, message bar, document map and thumbnails.

Zoom

The zoom section provides tools to zoom into or out of the document. You can choose your own zoom factor or use one of the predefined zoom factors of 100%, one page, two pages(side by side), or page width which causes the document to zoom in or out so it fills your window. Zoom highest percentage is 200% and minimum is 75%.

Window

The **new window** button will open your current document in a new window. The **arrange all** button will take your currently open windows and stack them one on top of the other. The **split** button will take your current document and show it in two frames within the window one on top of the other. This will allow you to look at something you wrote on page one while working on page twenty. **View side by side** allows you to view two windows side by side, once in side by side view you can turn on synchronous scrolling so both side scroll at the same time. The **switch window** drop down will allow you to switch between open windows.

Macros

The macros section provides the tools required to work with and create basic macros. You can view existing macros or record your own. Choose record macro from the drop down and then perform the functions you do often, like change the page layout, and style of the document. Once you have done those tasks then stop recording. You will be able to use that **macro** over again to shorten the steps you need to take every time you need to perform that set of tasks.

CTRL Shortcuts from A-Z:

CTRL + A = Select text
CTRL + B = **Bold** text
CTRL + C = Copy text
CTRL + D = Open font formatting window
CTRL + E = Center text
CTRL + F = Find a phrase
CTRL + G = Go To a specific page or bookmark
CTRL + H = Replace text with another text or replace text with different formatting
CTRL + I = Italicize text
CTRL + J = Justify text
CTRL + K = Open **Insert Hyperlink** window
CTRL + L = Left align text
CTRL + M = Indent a paragraph from the left
CTRL + N = Open new Word document
CTRL + O = Open an existing Word document
CTRL + P = Print Word document
CTRL + Q = Remove paragraph formatting
CTRL + R = Right align text

CTRL + S = Save Word document
CTRL + T = Create a hanging indent
CTRL + U = Underline text
CTRL + V = Paste text
CTRL + W = Close Word document
CTRL + X = Cut text
CTRL + Y = Redo an action previously undone OR repeat an action
CTRL + Z = Undo a previous action
F12 = Save As
F7 = Spelling and Grammar Alt + F8 = Macro

MS EXCEL - 2007

Microsoft Excel is a spreadsheet application program offered in the Microsoft office software package. This program allows you to perform calculations and use graphics tools, pivot tables. In addition, Excel can also be used to create charts and graphs.

RIBBON

The ribbon, a panel that houses the command buttons and icons, organizes commands as a set of tabs, each grouping relevant commands.

WORKBOOK

While opening MS excel the application screen that appears with some tools and 3 sheets by default to perform different calculations.

WORKSHEET

The sheet in a workbook from in combination with rows and columns to perform differently. We can insert maximum 255 sheets in excel.

COLUMN

The vertical lines in a sheet are known as a column. There is a total column in a sheet is 16384. The default width of a column is 8.43 point.

ROW

The horizontal lines in a sheet are known as a row. There are total 1048576 rows in a column. The height of a row by default is 15 point.

CELL

Intersection of row and column is called the cell.

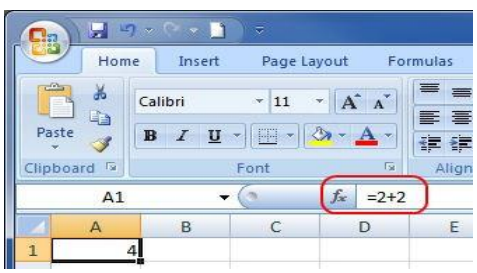
Cell = Column*Row

Grid Lines

The line which separate rows and columns are called grid lines. It is a nonprintable area by default.

Formula Bar

The Formula Bar is an area to display a cell's data. If the cell uses a formula, it will display the formula; if not, it will show the

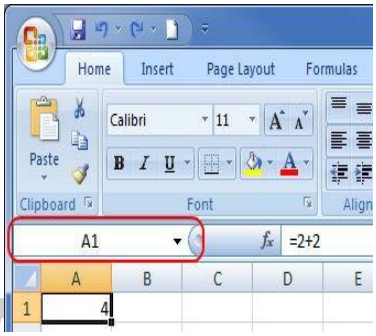


value. The cell A1 is selected, but the formula bar shows a formula.

Auto Calculate

Excel will automatically perform the calculation on a set of cells that you select and display the results on the status bar in the bottom right of your window. The default calculation is the sum function, but you can change the calculation by right-clicking on the auto calculate the result.

Name Box

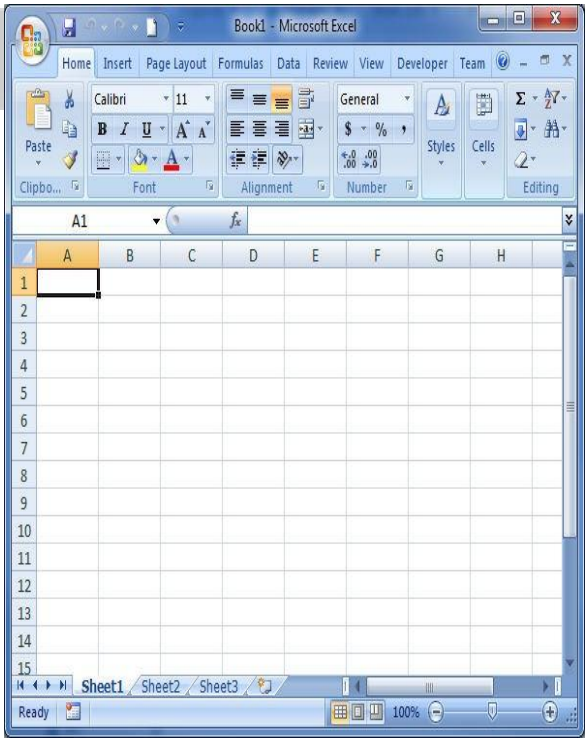


Located just to the left of the Formula Bar, the Name Box displays a reference to the selected cell. The Name Box will also display a "Named Range" if a cell range was given a name. The little arrow to the right will display all Named Ranges in the current workbook which, when selected, will highlight the cells in the Named Range.

AUTO FILL

Auto fill is an option which helps the user to automatically fill the above data underneath.

Home tab



Aligning Text

Top Align – this command aligns text to the top of the cell.

Middle Align – this tool will align text such that it will be centered towards the top and bottom of the cell.

Bottom Align – use this command to align text to the bottom of the cell.

Align Text Left – this tool lets you align text to the left of the cell.

Center – this command is for centering text in the cell.

Align Text Right – this one is for aligning text to the right of the cell.

Decrease Indent – this command decreases the margin between the cell border and the text in the cell.

Increase Indent – this tool increases the margin between the cell border and the text in the cell.

Wrap Text – this command makes all content visible within a cell by displaying it on multiple lines.

Merge and Center – this command joins the selected cells into one larger cell and centers the contents in the new cell.

Number Formats

General – this command helps to choose how the values in a cell are displayed. This could be general, number, currency, the percentage among others.

Accounting Number Format – use this command to set the alternate currency format you want for the selected cell. Open drop down button for more currencies.

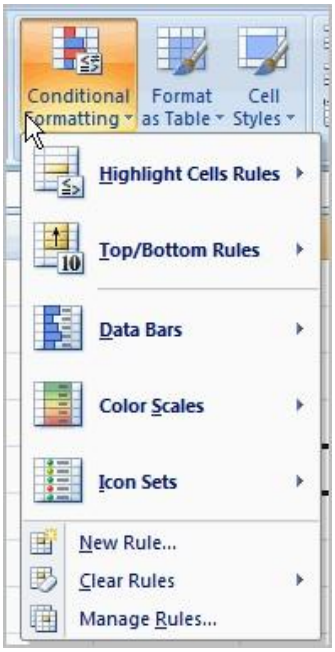
Percentage Style – use this command to apply the percentage format to selected cell(s).

Comma Style – this displays the contents of the cell with a thousand separators.

Increase Decimal – show more precise values by showing more decimal places.

Decrease Decimal - show less precise values by showing fewer decimal places.

Using Conditional Formatting



With conditional formatting, you can apply formatting to one or more cells based on the value of the cell.

To apply conditional formatting:

- Select the cells you would like to format.
- Select the Home tab.
- Locate the Styles group.
- Click the Conditional Formatting command. A menu will appear with your formatting options.

To remove conditional formatting rules:

- Click the Conditional Formatting command.
- Select Clear Rules.

Choose to clear rules from the entire worksheet or the selected cells**.**

Format as Table – this tool formats a range of cells and converts them to a table by choosing a pre-defined table style.

Cell Styles – use this to apply a cell formatting by choosing from pre-defined styles.

To insert- rows, column, cell, **sheet**:

- Select the row (below) and column where you want the new row and column to appear.
- Click the Insert command in the Cells group on the Home tab. The row and column will appear.
- Select the cell where you want new cell to appear.
- Click the Insert sheet command in the Cells group on the Home tab. The new sheet will appear.

To delete rows and columns:

- Select the row or column you'd like to delete.

- Click the Delete command in the Cells group on the Home tab.

Format rows, column, and cell:

When you open a new blank workbook, the cells, columns, and rows are set to a default size. You have the ability to change the size of each, as well as to insert new columns, rows, and cells as needed.

- Click the Format command in the Cells group on the Home tab. A menu will appear.
- Select Column Width to enter a specific column measurement.
- Select AutoFit Column Width to adjust the column so all of the text will fit.
- Select Row Height to enter a specific row measurement.
- Select AutoFit Row Height to adjust the row so all of the text will fit.

Auto sum

The auto sum button allows you to quickly insert the sum function. It is located in two places on the ribbon. On the right end of the "HOME" tab in the editing section, and on the far left of the "FORMULA" tab.

Fill – distribute a pattern into one or more adjacent (up,left,right,down) cells. This can be done in any direction and in any range of adjacent cells.

Clear – this command clears everything from the cell, or selectively removes the formatting, the contents, or the comments.

Sorting

Sorting lists is a common spreadsheet task that allows you to easily reorder your data. The most common type of sorting is alphabetical ordering, which you can do in ascending or descending order.

Filtering cells

Filtering, or temporarily hiding, data in a spreadsheet is simple. This allows you to focus on specific spreadsheet entries.

Filter

A Filter is an option through which we can sort out the value depending on criteria given by the user.

Insert tab:

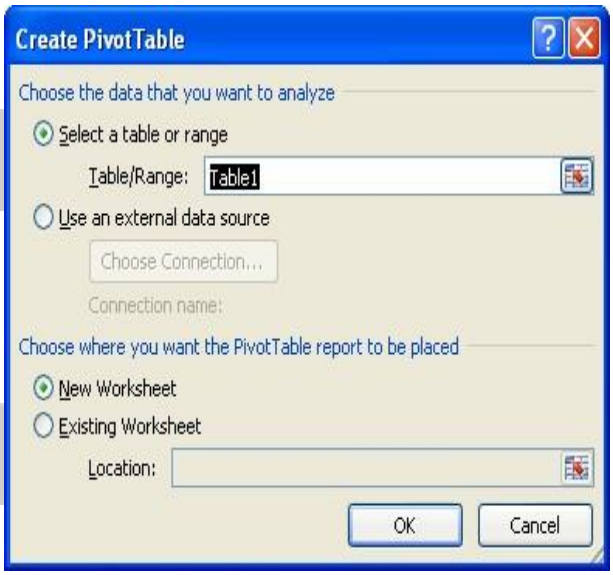
Creating PivotTables

Why are they named PivotTables?

Basically, PivotTables allow you to pivot, or move, data so you can produce answers to questions. It is an interactive representation of a data table. One can rearrange the data and choose what to display and what to hide.

To create a PivotTable report (Part I):

- Select the cells in your spreadsheet that you want to use in the PivotTable report.
- Select the **Insert** tab.
- Click the **PivotTable** command.
- Click **PivotTable** again. Excel selects cells in the actual spreadsheet, and the **Create PivotTable** dialog box opens.
    - **Select a table or range** is already selected, and the **Table/Range** field shows the range of the selected data. **New Worksheet** is also selected by default as the place where the report will be placed.



- Click **Existing Worksheet**, then select a worksheet if you do not want the PivotTable to appear in a new worksheet.
- Click **OK**.

Working with Charts

A **chart** is a tool you can use in Excel to communicate your **data graphically**. For example:- Column chart, bar chart, pie chart, line chart, area chart etc.

Creating a chart

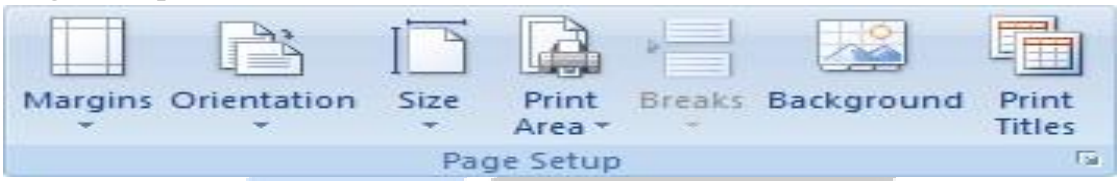
Click the Insert tab. Select one of the Chart options.

Hyperlink - Create a link to a Web page, a picture, an e-mail address or a program. You can also use the keyboard shortcut Ctrl + K to create a hyperlink.

Header & Footer - Edit the Header or Footer of the document. The information in the Header or Footer will appear at the top or bottom of each printed page.

Page Layout

Page Setup



Margins - Select the margin sizes for the entire document or the current selection.

Orientation - Switch the pages between portrait and landscape layouts.

Size - Choose a paper size for the current section. To apply a specific paper size to all sections of the document, click on More Paper Sizes.

Print Area - Mark a specific area of the sheet for printing.

Breaks - Specify where a new page will begin in the printed copy. Page breaks are inserted above and to the left of the selection.

Background - Choose an image to display as the background of a sheet.

Print Titles - Specify rows and columns to repeat on each printed page.

Scale to Fit:-

Width - Shrink the width of printed output to fit a maximum number of pages.

Height - Shrink the height of printed output to fit a maximum number of pages. Scale - Stretch or shrink the printed output to a percentage of its actual size. The maximum width and height must be set to "Automatic" to use this feature.

Sheet Options:-

Gridlines - Show, or hide, the lines between rows and columns in the sheet. These lines will not print unless the Print box is checked.

Headings - Show row and column headings. Row headings are the row numbers on the side of the sheet that range from 1 to 1,048,576. Column headings are the letters that appear above the columns on a sheet that range from A to XFD. This is also found on the View tab of an Excel Workbook. These headings will not print unless the Print box is checked.

Formula

Functions

Excel has created hundreds of functions that prevent you from having to write out complex or repetitive formula yourself. Functions can be inserted by clicking on the function symbol to the left of the formula bar.

Name manager

You can use name manager to name a group of cells, and therefore only type one name when you want to perform a calculation with that group. This can be useful when you are performing many different calculations on the same set of numbers, especially when you want to perform these calculations across multiple sheets.

Defined Names: - We use this option to define the name of a cell, range and the list of the already defined name can be viewed in Name manager and we can edit it if we want to change the range or cell reference of any defined name. Also, we can use the defined name in Formulas.

Formula Auditing: - This option helps us to identify the relation of formulas. By using **Trace precedent**, we get to know on which cell formula cell is based. **Trace dependents** are used to know if active cell is being used in any formula. When we use trace precedent and trace dependents the arrows get inserted automatically and, to remove the arrows, we use **Remove Arrows**. **Show formula** is a self-explained word; it is used to show the formula in the sheet. **Error checking** is used to check the error in the sheet. **Evaluate formula** option is used to evaluate the formula step by step.

Data tab

FILTER

A Filter is an option through which we can sort out the value depending on criteria given by the user.

Text to Columns

To separate the contents of one Excel cell into separate columns, you can use the 'Convert Text to Columns Wizard'. For example, when you want to separate a list of full names into last and first names.

Remove Duplicates

Use the Remove Duplicates command in the Data Tools group on the Data, to filter for unique values and remove duplicate values.

Data Validation

Use data validation in Excel to make sure that users enter certain values into a cell.

Consolidate

To summarize and report results from data on separate worksheets, you can consolidate the data from each separate worksheet into one worksheet. The worksheets you consolidate can be in the same workbook or in other workbooks.

What if analysis

What-If Analysis is the process of changing the values in cells to see how those changes will affect the outcome of formulas on the worksheet. Three kinds of What-If Analysis tools come with Excel: Scenarios, Goal Seek, and Data Tables.

Goal seek

Goal seek is useful if you know the needed result but need to find the input value that will give you the desired result.

Scenario

A Scenario is a set of values that Excel saves and can substitute automatically on your worksheet. You can create and save different groups of values as scenarios and then switch between these scenarios to view the different results.

Data tables

Data tables are defined as a range of cells that are used for testing and analyzing outcomes on a large scale. It is a way to see how altering the values in a formula affect the results.

Group and Ungroup

Tie a group of cells together and ungroup is used to separate them.

Subtotal

The Microsoft Excel SUBTOTAL function returns the subtotal of the numbers in a column in a list or database.

Review tab

Protect Sheet

Protect Sheet command that prevents others from making changes to the layout of the worksheet in a workbook. You can assign a password when you protect a worksheet so that only those who know the password can unprotect the worksheet and make changes to the layout of the worksheet.

Protect Workbook

If you protect the workbook structure, users cannot insert, delete, rename, move, copy, hide or unhide worksheets anymore.

Share Workbooks

If you share a workbook, you can work with other people on the same workbook at the same time. The workbook should be saved to a network location where other people can open it. You can keep track of the changes other people make and accept or reject those changes.

Allow specific users to edit ranges in a protected spreadsheet

Excel offers you an ability to assign user-level permissions to different areas on a protected spreadsheet. You can specify which users can edit a particular range while the spreadsheet is protected.

Track Changes in Excel

Microsoft's Track Changes function allows revisions to be made to a document and keeps a complete record of all changes.

View Tab

View tab contains 5 groups:-

a) **Workbook Views**: -Excel offers 4 types of workbook views: – Normal, Page break preview, Page layout & Custom View. We use “Normal” option to see the normal view of Excel. We use Page break preview option to see that where the page-breaks appear when we print the document.

Through “Page layout” option, we can check from where does the page begin and end as well as to see any header / footer on the page. We use Custom View option to save the current display and setting as a custom view which we can apply in future.

b) **Show**: – We use this option to show and hide the Excel’s view. Ruler is used to show the rulers next to our documents. Grid lines option is used to show the lines between rows and columns in the sheet to make the sheet easier to read. Through Formula bar, we can obtain the formula for the active cell. Heading is used to show the heading of columns and rows number.

c) **Zoom**: -We can adjust the view as per our convenience. Zoom 100% is the standard view for viewing the Excel file. We use Zoom to selection to zoom the sheet so the selected range of cells fills the entire window.

d) **Window**: -We use this option to access the window options. **New window** is used to open the same document in the new window, and we can perform in the both windows and thus both documents will get updated. **Arrange all** option helps us to stack the already opened window so that we can see all of them at once. **Freeze Panes** option is very useful for viewing vast data with the headers or we can use it to mark the comparison. Its usage always depends on requirement. **Split** option is used to divide the window into different panes such that each scrolls separately. **Hide** option is used to hide the current window.

e) **Macros**: Macro is often used for repetitive perform in Microsoft Excel.

Shortcut Keys

ALT+F1 - This creates a chart out of the data in the current range (selected cells). This is the most well known feature of Excel, and now you know a new way to use it!

ALT+SHIFT+F1 - This inserts a new worksheet into the workbook.

CTRL+F6 - This switches to the next workbook window when multiple workbook windows are open.

CTRL+SHIFT+# - This applies the date format with a default order of day, month, and year.

CTRL+ ; - This enters the current date in the selected cells.

CTRL+SHIFT+: - This enters the current time in the selected cells.

CTRL+D - This uses the fill down command on the selected cells. Fill down copies the content and format of the topmost cell into the cells below.

CTRL + T – Insert table.

CTRL + SHIFT + L – This is used to insert filter.
CTRL+R - This uses the fill right command on the selected cells. Fill right copies the content and format of the leftmost cell to the cells to the right.

MS Power Point

What is MS Power Point?

Microsoft PowerPoint is powerful presentation software developed by **Microsoft**. The program uses slides to convey information rich in multimedia.

What is the use of Microsoft Power Point?
Microsoft PowerPoint, usually just called PowerPoint, is a commercial presentation program developed by Microsoft. It is part of the Microsoft Office suite and generally uses a graphical approach to presentations in the form of slide shows.

Home tab

New Slide:-

Open the presentation that you want to add a slide to. In the pane that contains the Outline and Slides tabs, click Slides, and then click where you want to add a slide.
Insert a new slide - **Ctrl + M**
Duplicate slide **– Ctrl + D**

Insert tab

Links

If you want to insert the Link in PowerPoint presentations. You can Insert 2 types of links in PowerPoint presentations. Simple links (Hyperlink), second Action Link. Slides through action Link is define to Mouse Click and Mouse Hover over a specific word of action.

Media Clips

Media clip groups contain two commands. Clip Arts animated by first Command Movie are inserted into PowerPoint presentations. And another Command Sound the Audio File.

Design Tab

The Design Tab contains a total of 3 groups. The names of these groups are respectively, Page Setup, themes, and Background.

Page Setup

You want to create Slide in Paper Size. You can Set the Page to Margin. You can also Change the Orientation of Presentation. There are two Orientation.- first, portrait and second, is the landscaping orient.

Themes

This Group is used to use the different themes in PowerPoint presentations. From here you can use any themes in your slides as per your preference. And you can also Customize your colours, fonts, effects according to your own.

Background

The background Command is used by a Particular to Change the background style in the theme. You can use that theme specific to the **Background style** according to your usage. If you do not want the background for this theme, you can **Hide** the background Graphics.

Animations Tab

Animations Tab contains a total of 3 groups. The names of these groups are respectively previewed, animations and transition to this slide.

Preview

The Preview command is used to view animations and Slide transits created for PowerPoint presentations. You created the Animation for your Presentation. And you want to see the Slide in the transition. This command is used to view its preview.

Animations

The Animation is Set for Text or objects (shapes, clip-arts, pictures, etc.) available in Slide by this command. You want to Set the Animation for the Object or Text. Select it first. And then set the Animation for it. You can do individual Animation settings for each Object. You can also Setting entrance, Exit etc. Call it **Custom Animation.**

Transition to This Slide

This command is Set to Slide transit. You can apply it to the Object by choosing a useful transition from here. and can see his preview. If you need to add Sound with this transit, you can also add it through the Transit Sound command. And transit Speed can also be Set according to you.

Slide Show Tab

Slide Show Tab contains a total of 3 groups. The names of these groups are the Start Slide Show, Set Up, and monitors respectively.

Start Slide Show

Commands available in this Group control the Slide Show. This Group mainly contains 3 commands. The first **from beginning** command Slide Show starts with the first Slide. The second command starts with the **Current Slide** command from the Slide Show that Slide. The Slide we are currently working

on. if you don't want to run your Slide Show. You can also Set the **Custom Slide Show** by choosing the slides as you want. If you don't want to show a Slide in the Slide show, you can also Hide that Slide. Slide show – F5

Set Up

This Group contains 5 commands. The first command **Set Up** Slide show Advance settings related to the Slide show. The second command is used to hide the selected Slide by the **Hide Slide** from the Slide Show. Narration record is performed for a Particular Slide via the third command **Record narration**. If you have microphone, you can Record your own voice narration. The fourth command is rehearsal of the Slide Show by **rehearse timings**. Slide Show Time, slides, etc. The last command **use rehearsed timings** is used only to timings show the time that it takes during the rehearse Slide of the Slide show. If you want to use this timings – Check and if you don't want to use this timings - Unchecked it.

Review Tab

The review Tab of PowerPoint has a total of 2 groups. The names of these groups are proofing and comments.

Proofing

The proofing Group contains a lot of work commands related to PowerPoint presentations. This Group primarily contains spelling, research, thesaurus, Translate, Language, etc. commands. The most important Command is spelling. **Spelling and grammar** related errors that occur in any Text written in PowerPoint Slide can be corrected. Contains **a thesaurus** Command to find synonyms for a word. You can also **Translate** the Document in different languages in MS PowerPoint through the Translate Command. The **language** Command is Set by the language. The language for which you want to spelling & grammar Check.

Comments

If you want to type something extra about a specific word or word group, available in a PowerPoint presentations. Then it is used to Command the Comment. You can write New comments from here. Previous Comment can also Edit, Delete.

View Tab

The View Tab contains a total of 6 groups. The names of these groups Presentation views, Show/name respectively Hide, Zoom, Color/Gray scale, Window and macros.

Presentation Views

You can view a PowerPoint presentations in different ways before you Print or before you Publish it in MS PowerPoint. There are 4 types of Presentation

views available in Document views. The Presentation in **normal view** is displayed in normal view. This will look like after Presentation is Print. All slides available in a Presentation at **Slide Sorter View** are shown together on Computer Screen. The slides in the **Notes Page view** is displayed in Notes view. And last, but most importantly, all slides available in Presentation in the **Slide show View** are shown in Slide show. This way slides is shown on the entire computer Screen. You can Control the Slide Show through Mouse Click or Auto Time.

Show/Hide

Show/Hide Group has several tools related to Presentation. You'll find 2 tools primarily. **Ruler** the first tool. You can view and change the Slide of the margins. The second tool contains **Grid lines**. It can be used when you Insert objects in PowerPoint slides. Enable this is divided into full Page Grid lines.

Zoom

The available commands in Zoom Group are used to view the slides on individual Zoom levels. You can view the slides by making them larger or smaller by using the available commands. Or you can also view the slides in **Fit to Window**. The **maximum** zoom percentage is **400%** and **minimum** is **33%**.

Colour/Greyscale

If you want to see Presentation in colour, use the colour Command. And if you don't want to see Presentation in Colour, use the grey scale Command.

Window

If you work on more than one PowerPoint presentations at a time. The Window Group is built for you. You hereby control Open PowerPoint Windows. You can go to another Window by working in a Presentation. And that can go in any other Presentation or two presentations can be shown simultaneously on Desktop.

MS ACCESS

Ms Access definition: It is a part of ms office. It is a programme to maintain the database. It was created by ms corporation ltd. Ms access is a database management system programme. We can use this programme to manage the record in our computer. For example - name, add, employee.

Features: -

- Access provides a user-friendly forms interface that allows users to enter information in a graphical form.
- It allows us to create forms, tables and so on for storing information in a database.
- Microsoft Access forms provide a quick and easy way to modify and insert records into your databases.
- Microsoft Access has capabilities to answer more complex requests or queries.
- Access queries provide the capability to combine data from multiple tables and place specific conditions on the data retrieved.

Use of Ms Access:

Access is a flexible and relatively simple way to create databases to store, manage and enter data. It even exceeds the capabilities of Excel.

Primary Key:

A primary key, also called a primary keyword, is a key in a relational database that is unique for each record. It is a unique identifier, such as a driver license number, telephone number (including area code), or vehicle identification number (VIN). A relational database must always have one and only one primary key.

Objects of Ms Access:

An Access database contains objects such as tables, queries, forms, reports, pages, macros, and modules.

Table:

The combination of row and column is called table. Tables are main objects in a database because they hold all the information or data. A table has records (rows) and fields (columns). Fields have different types of data, such as text, numbers, dates, and hyperlinks. For example, a database for a business can

have a Contacts table that stores the names of their suppliers, e-mail addresses, and telephone numbers.

Form:

A form in Access is a database object that you can use to create a user interface for a database application. Forms are much like paper forms: you can use them to enter, edit, or display data. They are based on tables. When using a form, you can choose the format, the arrangement, and which fields you want to display.

Query:

A query is a request for data results, and for action on data. You can use a query to answer a simple question. It is not only able to display records, but also able to perform specific tasks and actions based on user defined criteria. A Make Table Query creates a new table in your database based on the results of a query.

Report:

A report is an object in Microsoft Access that is used to display and print your data in an organized manner. A database report is the formatted result of database queries and contains useful data for decision-making and analysis.

What are relationships in Microsoft Access?

In a relational database (Access), the data in one table is related to the data in other tables. In general, tables can be related in one of three different ways: one-to-one, one-to-many or many-to-many.

One to One:-

In a one-to-one relationship each record in one table has at most one related record in another table.

In a one-to-one relationship, each record in Table A can have only one matching record in Table B, and each record in Table B can have only one matching record in Table A. You might use a one-to-one relationship to divide a table with many fields.

One to Many:-

A one-to-many relationship often referred to as "parent-child" relationship.

A one-to-many relationship is the most common type of relationship. In a one-tomany relationship, a record in Table A can have many matching records in Table B, but a record in Table B has only one matching record in Table A.

Many to Many:-

In a many-to-many relationship, a record in Table A can have many matching records in Table B, and a record in Table B can have many matching records in Table A. This type of relationship is only possible by defining a third table (called a junction table). A many-to-many relationship is really two one-to-many relationships with a third table.

Ms Access - Data Types

A field's data type determines what kind of data it can store**.**

Type of Data	Description	Size
Text	**Text or combinations of text and numbers, including numbers that do not require calculating (e.g. phone numbers).**	**Up to 255 characters.**
Memo	**Lengthy text or combinations of text and numbers.**	**Up to 63, 999 characters.**
Number	**Numeric data used in mathematical calculations.**	**1, 2, 4, or 8 bytes (16 bytes if set to Replication ID).**
Date/Time	**Date and time values for the years 100 through 9999.**	**8 bytes**
Currency	**Currency values and numeric data used in mathematical calculations involving data with one to four decimal places.**	**8 bytes**
AutoNumber	**A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table.**	**4 bytes (16 bytes if set to Replication ID).**

Yes/No	**Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off).**	**1 bit.**
Attachment	**Files, such as digital photos. Multiple files can be attached per record. This data type is not available in earlier versions of Access.**	**Up to about 2 GB.**
OLE objects	**OLE objects can store pictures, audio, video, or other BLOBs (Binary Large Objects)**	**Up to about 2 GB.**
Hyperlink	**Text or combinations of text and numbers stored as text and used as a hyperlink address.**	**Up to 8,192 (each part of a Hyperlink data type can contain up to 2048 characters).**
Lookup Wizard	**The Lookup Wizard entry in the Data Type column in the Design**	**Dependent on the data type of the lookup field.**
	view is not actually a data type. When you choose this entry, a wizard starts to help you define either a simple or complex lookup field.	

Extension name:

Ms Paint - .bmp
Notepad - .txt
Wordpad - .rtf

Ms word - .docx
Ms Excel - .xlsx
Ms powerpoint - .pptx
Ms access - .accdb

Full forms:

www – World Wide Web
isp – Internet service provider
url – Uniform resource locator
ip – Internet protocol
cmos – Complementary metal oxide semiconductor
ftp – File transfer protocol
gif – Graphical interchange format
gui – Graphic user interface
bmp – Bitmap image
http – Hyper text transfer protocol
tcp – Transmission control protocol
modem – Modulator demodulator
usb – Universal serial bus
ups – Uninterrupted power supply

Shortcut Key

Minimize : Window+m
Maximize: Window+shift +m
Shut down : ctrl+alt+del
Refresh: F5
Full Screen: alt+enter

Definition:-

Desktop: A desktop computer is a personal computer that fits on or under a desk. It has a monitor or another display, keyboard, mouse, and either a horizontal or vertical (tower) form factor. Unlike a laptop, which is portable, a desktop computer is meant to stay at one location.

Screen Saver: A screen saver or screensaver is a software program that becomes activated after the computer is inactive for a specified amount of time. Screensavers were originally designed to help prevent images or text from being burned into older monitors.

Printer: A printer is an external hardware output device that takes the electronic data stored on a computer or other device and generates a hard copy of it. For example, if you created a report on your computer, you could print several copies to hand out at a staff meeting. Printers are commonly used to print text and photos

Upload: Transfer of data from client computer to server computer. Uploading means sent data from computer to the internet.

Download: Downloading means your computer is receiving data from the internet.

Chat: Talk in friendly and informal way. Communication to have a conversion with another person or other people on the internet.

Search Engine: Search Engine is a service that allows internet users to search for content via the World Wide Web. A users enters the keywords into a search engine and receives a list of web content results in the form of websites, image.

Clipboard: - A clipboard is a temporary storage area for data that the user wants to copy from one place to another. In a word processor application, for example, the user might want to cut text from one part of a document and paste it in another part of the document or somewhere else.

Recycle bin: - Recycle bin is used by windows computes to store deleted items. You can open recycle bin by double- clicking the icon on the windows desktop.

When you delete items from the recycle bin the items are permanently delete.

With the recycle bin, you can restore items, which are deleted by mistake.

My Computer: My Computer is a section of Microsoft Windows first found in Windows 95 and included with all later versions that allows you to explore and manage the contents of your computer drives.

Word Wrap: Word wrapping is when a line of text automatically "wraps" to the next line when it gets to the end of a page or text field.

Slide: A slide is a single page of a presentation. Collectively, a group of slides may be known as a slide deck. ... In the digital age, a slide most commonly refers to a single page developed using a presentation program such as Microsoft PowerPoint, Apple Keynote, Apache OpenOffice or LibreOffice.

Worksheet: A worksheet or sheet is a single page in a file created with an electronic spreadsheet program such as Microsoft Excel or Google Sheets.

Workbook: A workbook is the name given to an Excel file and contains one or more worksheets. So, when you open an electronic spreadsheet program it loads an empty workbook file consisting of one or more blank worksheets for you to use. Each workbook maintains a collection of worksheets that allows you to add and delete worksheets.

Define the following functions in excel

Sum(): This function is most used function in excel . This function used to adds all numbers is a range.

Syntax

=Sum (number1,number2,.....)

Average: This function is used for find the average value in a range of cells.

syntax

=Average (number1,number2,.....)

Count:

The count function is used to count the number of cells in a range of cells.

syntax

=count (number1,number2,.....)

Today():

The TODAY function is useful when you need to have the current date displayed on a worksheet.

Syntax: =TODAY ()

IF Function

The if function is one of the most popular function in excel and if allows you to make logical comparisons between a value and what you expect.

Syntax:

=IF(logical test,[value if true],[value if false])

SumIf Function

The sum if function is a worksheet function that adds all numbers is range of cells based on one criteria.

Syntax:

=Sum If(range,criteria,[sum range])

CountIf

Excel countif function is used for counting cells within a specified range that meet a certain criteria or condition. For example, you can write a countif formula to find out how many cells in your worksheets contain a number greater than or less than the number you specify.

syntax = countif(range, criteria)

Clip Art:

Clip art is a collection of pictures that can be imported into a document or another program. You can copy and paste any image into your document.

Smart Art:

Create a smart art graphics to quickly and easily make a visual representation of your information. You can choose from among many different layouts to effectively communicate your message or ideas.

Hyperlink:

A hyperlink or simply a link is reference to data that the reader can directly follow either by clicking or tapping. A hyperlink points to a whole document or to a specific element with in a document.

Header and Footer:

The header is a section of the document that appears in the top margin, while the footer is a section of the document that appears in the bottom margin. Headers and footer generally contain information such as page number, date and document name.

Quick Part:

You can use the quick part gallery to create, store and reuse pieces of content, including auto text, document properties and fields. These reusable block of content are also called building blocks.

Word Art:

Word Art is a text modifying feature in Microsoft word, a popular word processing program. It includes effect such as shadows, outlines, colors, and 3D effects that can be added to a word or phrase.

Drop-Cap:

A drop cap is a large capital letter at the beginning of a text block that has the depth of two or more lines of regular text.

Water mark:

A water mark is a graphic or word displayed as the background to a written document .Typically a water mark appears in a light gray, large font. So, it can be easily seen by readers of the document.

Indent:

In word processing, the word indent is used to describe the distance, or number of blank spaces used to separate a paragraph from the left or right margins.

Footnote:

A footnote is additional information that is located at the bottom of a page in document.

Endnote:

An endnote is reference, explanation or comment placed at the end of an article, research paper, chapter.

Mail Merge:

Mail Merge means is a features with most data processing applications that enables users to send a single and similar letter to multiple recipients. It enables connecting a single form template with a data source that contains information about the recipient's name, address and other predefined data.

Thesaurus:

Suggest other word with similar meaning to the word you have selected.

Macro:

A Macro is a series of commands and instructions that you group together as a single command to do a task automatically.

Question: What is Ms-Word? What are its features?

Answer: Microsoft word is used to create various types of official documents that you can print and publish when you open a Microsoft word. It contains default documents like a paper.

Features of ms word

Spelling Check

Mail Merge

Find and Replace

Clip Art

Word Art

Question: What is Text Alignment and its types:

Answer: Text Alignment is a word processing software features that allows users to horizontally align text in a page.

- **Right Alignment:**

  This starts each new line of the document on the right-most margin of the page.

- **Left Alignment:**

  As the default alignment is most processing software, it starts each line on the left-most margin.

- **Center Alignment:**

  This position and starts each new line in the center margin on the page.

- **Justified Alignment**:

  This Align text with right and left margins and tries to fill as much empty space as possible. It enables a straight margin on both of the pages horizontal edges.

Question: What are the different views in Power Point?

Answer: The views in Power Point that you can use to edit, print and deliver your presentation.

Normal View: - This is the default view in Power Point. It is used to display a single slide at a time. This is good for editing individual slide.

Slide Sorter View:- Slide Sorter view display thumbnail size representation of all slides in your presentation. This view also allows you to reorder, delete your slides.

Notes Page View:- This is a speaker notes. This view display notes in a page view.

Slide view:- In this view we can view the slide in full screen resolution. Remember that this is purely a display view and no editing can be done on slide.

Slide Master View:- This view used to change in the entire presentation. From there, you can edit the slide master, which will affect every slide in the presentation.

Question: What are the different way to create a Power Point Presentation?

Answer: 1. Create a Power Point presentation using a Template.

Microsoft offers many free presentation templates that you can use to create professional slide shows. Click the "Office Button" in Power Point , Click "New" and then click "Installed Templates" or "My Template". Select a template you would like to use form the gallery.

2. Create a Power Point Presentation from Blank Presentation.

Open a "Blank Presentation" from by clicking "New" from the "Office Button" and selecting "Blank Presentation" or use the keyboard shortcut "ctrl+N" . Go to the "Design" tab and select a theme from the gallery.

Question. What is the difference between animation and transition?

Answer: 1) Slide transition are the animation effects that are applied to whole slide whereas Animation effects are applied to objects (text, shape etc) on a slide.

2) You can apply only one transition effect on a slide while each object on the slide can have multiple animation effects.

Question: What is the difference between a file and a folder?

Ans.

Files	**Folder**

It is a collection of different kind off data like text files, document, workbook, pictures etc.	It is used to store different files and sub folders.
Files are taking spaces on computer memory.	Folders are not taking spaces on computer memory.
You can easily move or copy data from one file to another.	You can copy or move files from one folder to another.
Each file has its own extension.	A folder does not have any extension.

Question: **Differentiate between window operating system and DOS.**

Answer:

Window operating system	Disk operating system
Window is a range of graphical interface operating systems that are developed by Microsoft.	Disk operating system are simply text command operating systems.
Windows use graphics, images and	Dos used a text based interface
text.	that required text and codes to operate.

Windows is multitasking operating system, allowing more than one process to work quickly.	Dos is unable to run multiple process at same time.

.

Question: What is spreadsheet? What are its uses?

Answer: A spreadsheet also known as a worksheet contains rows and columns and is used to record, compare and process data.

Use of Spreadsheet:

- Spreadsheets are ideal for financial data, such as your checking account information, taxes, billing and any payment.
- Teachers can use spreadsheet to track students, calculate grades, average.
- Graphing or charting data to assist users in identifying data trends.
- Sorting and filtering data to find specific information.

Question: What is the difference between header and footer?

Answer: 1) Header is a text that is printed at the top of each page in Document whereas footer is printed at the bottom of each pages.

2) BY default, headers are printed 0.5 inches from the top of the Page and footers printed 0.5 inches from the bottom of the page**..**

Question: What is Ms Excel?

Answer: Ms Excel is a spreadsheet application program offered in the Microsoft office software package. This application allows you to perform calculation and use graphics tools, pivot tables.

Features of ms excel

Pivot table
Filter
Chart
Data validation

NETWORK

A network is a collection of computers, servers, mainframes, network devices, peripherals, or other devices connected to one another to allow the sharing of data. An example of a network is the Internet, which connects millions of people all over the world.

All networks consist of following components:-

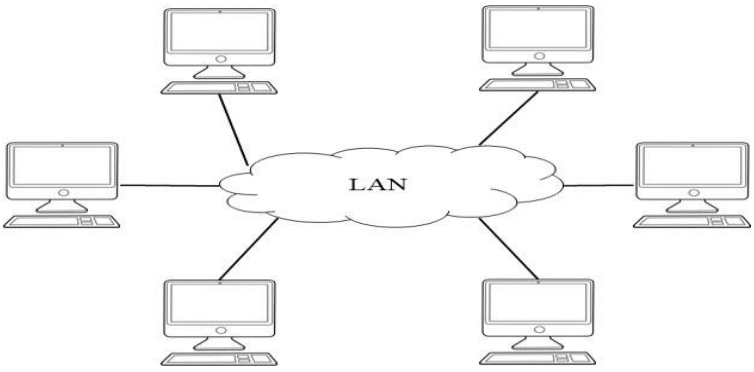
1. **Server: -** A server is a computer that provides resources to the other computers present on the network.
2. **Client: -** Clients are the set of computers that access shared network resources provided by the server.
3. **Media: -** Media is the way in which the computers are connected.
4. **Resources: -** Resources are files, printers, etc. used by network users.

Types of Computer Network:-

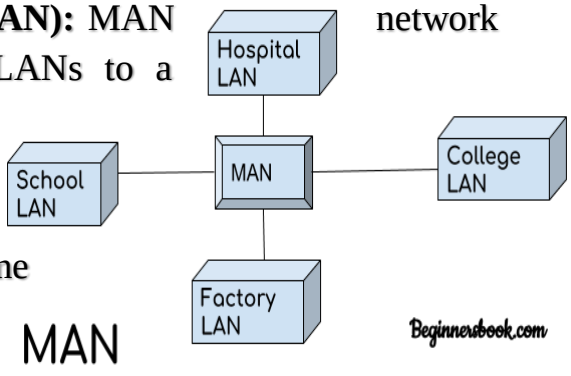
These are divided into three main categories. Difference is in their geographical range: -

- LAN (Local Area Network)
- WAN (Wide Area Network)
- MAN (Metropolitan Area Network)

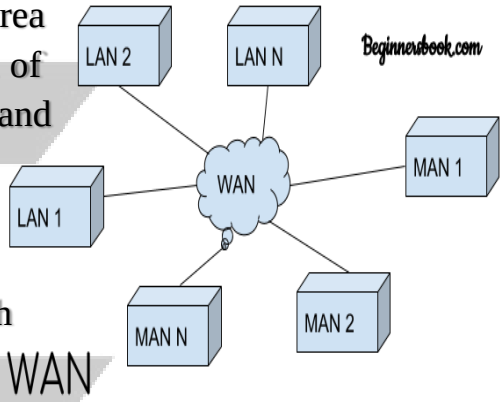
1. **LAN (Local Area Network):** Local area network is a group of computers connected with each other in a small places such as school, hospital, apartment etc.. LAN is secure because there is no outside connection with the local area network thus the data which is shared is safe on the local area network and can't be accessed outside.LAN due to their small size are considerably faster, their speed can range anywhere from 100 to 100Mbps. LANs are not limited to wire connection, there is a new evolution to the LANs that allows local area network to work on a wireless connection.



2. Metropolitan Area Network (MAN): MAN network covers larger area by connections LANs to a larger network of computers. In Metropolitan area network various Local area networks are connected with each other through telephone lines. The size of the Metropolitan area network is larger than LANs and smaller than WANs (wide area networks), a MANs covers the larger area of a city or town.



3. Wide area network (WAN): Wide area network provides long distance transmission of data. The size of the WAN is larger than LAN and MAN. A WAN can cover country, continent or even a whole world. Internet connection is an example of WAN. Other examples of WAN are mobile broadband connections such as 3G, 4G etc. It contains collection of machines called hosts



BASIS OF COMPARISON	LAN	MAN	WAN
Stands For	Local Area Network	Metropolitan Area Network	Wide Area Network

Definition	LAN (Local Area Network) is a computer network covering a small geographic area, like a home, office, school, or group of buildings.	A metropolitan area network (MAN) is a network with a size between a LAN and a WAN. It normally covers the area inside a town or a city.	WAN (Wide Area Network) is a computer network that covers a broad area (e.g., any network whose communications links cross metropolitan, regional, or national boundaries over a long distance).
Covers	Local areas only(e.g., homes, offices, schools)	covers the area inside a town or a city.	Large geographic areas (e.g., cities, states, nations)
Ownership of Network	Private	Private or Public	Private or Public
Speed	High speed (1000 Mbps)	moderate speed(44 to 155 Mbps)	Less speed (150 Mbps)
Maintenance	Easy	Difficult	Difficult
Example	The network in house .	The network in city building can be a MAN	The Internet is a good example of a WAN

Client-Server Model

The Client-server model is a distributed application structure that partitions task or workload between the providers of a resource or service, called servers, and service

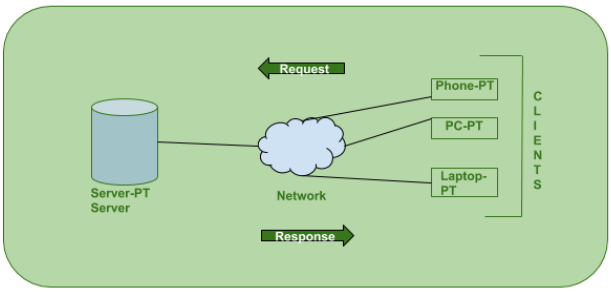
requesters called clients. client-server architecture, when the client computer sends a request for data to the server through the internet, the server accepts the requested process and deliver the data packets requested back to the client. Clients do not share any of their resources. Examples of Client-Server Model are Email, World Wide Web, etc.

How the Client-Server Model works ?

In this article we are going to take a dive into the **Client-Server** model and have a look at how the **Internet** works via, web browsers. This article will help us in having a solid foundation of the WEB and help in working with WEB technologies with ease.

- **Client:** When we talk the word **Client**, it mean to talk of a person or an organization using a particular service. Similarly in the digital world a **Client** is a computer (**Host**) i.e. capable of receiving information or using a particular service from the service providers (**Servers**).
- **Servers:** Similarly, when we talk the word **Servers**, It mean a person or medium that serves something. Similarly in this digital world a **Server** is a remote computer which provides information (data) or access to particular services.

So, its basically the **Client** requesting something and the **Server** serving it as long as its present in the database.

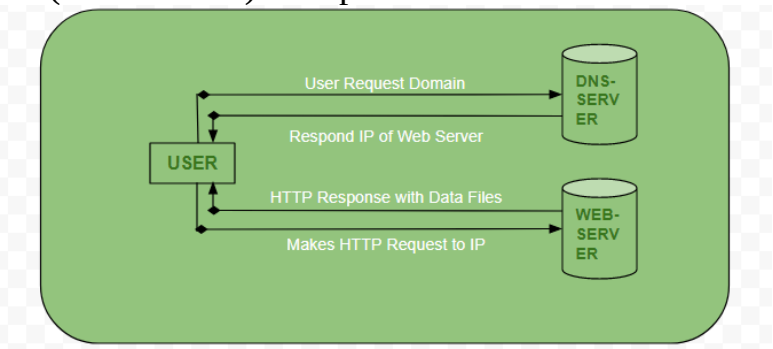


How the browser interacts with the servers ?

There are few steps to follow to interacts with the servers a client.

- User enters the **URL**(Uniform Resource Locator) of the website or file. The Browser then requests the **DNS**(DOMAIN NAME SYSTEM) Server.
- **DNS Server** lookup for the address of the **WEB Server**.
- **DNS Server** responds with the **IP address** of the **WEB Server**.
- Browser sends over an **HTTP/HTTPS** request to **WEB Server's IP** (provided by **DNS server**).

- Server sends over the necessary files of the website.
- Browser then renders the files and the website is displayed. This rendering is done with the help of **DOM** (Document Object Model) interpreter, **CSS** interpreter and **JS Engine** collectively known as the **JIT** or (Just in Time) Compilers.



Advantages of Client-Server model:

- Centralized system with all data in a single place.
- Cost efficient requires less maintenance cost and Data recovery is possible.
- The capacity of the Client and Servers can be changed separately.

Disadvantages of Client-Server model:

- Clients are prone to viruses, Trojans and worms if present in the Server or uploaded into the Server.
- Server are prone to Denial of Service (DOS) attacks.
- Data packets may be spoofed or modified during transmission.
- Phishing or capturing login credentials or other useful information of the user are common and MITM(Man in the Middle) attacks are common.

Authentication

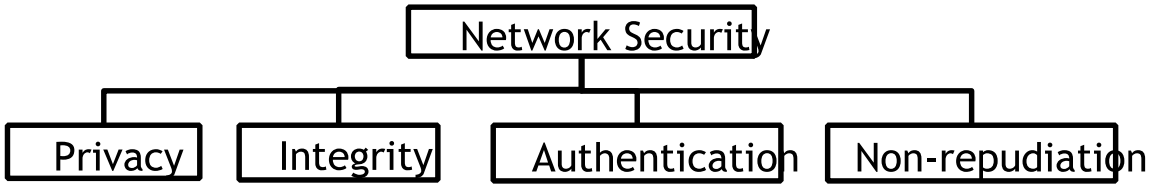
It means the receiver must be sure about the sender' s identity.

Non-repudiation

It means that a receiver must be able to prove that the received

Network Security Concepts

Network security is becoming more and more crucial as a result of increase in volume of data and number of Internet users all over the world. Each use expects confidentiality and data integrity, sender identification. The security involves four aspects as follows:



Privacy:- It means that the sender and the receiver expect confidentiality. The transmitted message should be received by the intended receiver. The message should be unintelligible to others.

Integrity:- It means that the data must be received exactly as it was sent by the receiver, i.e., there must be no changes during the transmission, either intentionally or accidentally. The integrity of the message must be retained.

Web Surfing:- Alternatively referred to as web surfing, surfing describes the act of browsing the Internet by going from one web page to another web page using hyperlinks in an Internet browser. The term "surfing" was first coined by Mark McCahill.

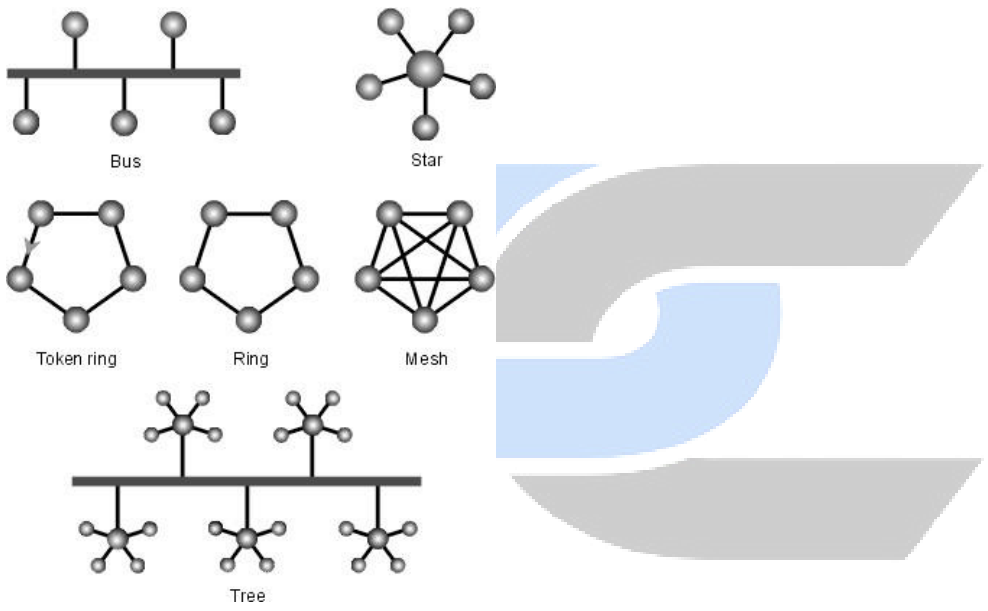
Cookies :Cookies are small pieces of data sent from a website and stored on the users computer by the web browser while the users is browsing. Cookies were designed to be reliable mechanism for websites to record users browsing activity.

Search Engine

A search engine is software accessed on the Internet that searches a database of information according to the user's query. The engine provides a list of results that best match what the user is trying to find. **Example:-**Google, yahoo etc

Topology:-

The physical layout or the way in network communication are made is known as topology. There are several common physical topologies, as described.



Types of physical topologies:

BUS Topology

In the bus network topology, every workstation is connected to a main cable called the bus. Therefore, in effect, each workstation is directly connected to every other workstation in the network.

Features of Bus Topology

1. It transmits data only in one direction.
2. Every device is connected to a single cable

Advantages of Bus Topology

1. It is cost effective.
2. Used in small networks.
3. It is easy to understand

Disadvantages of Bus Topology

1. Cables fails then whole network fails.
2. Cable has a limited length.

RING Topology

It is called ring topology because it forms a ring as each computer is connected to another computer, with the last one connected to the first.

A number of repeaters are used for Ring topology with large number of nodes, because if someone wants to send some data to the last node in the ring topology with 100 nodes, then the data will have to pass through 99 nodes to reach the 100th node. Hence to prevent data loss repeaters are used in the network

Features of Ring Topology:-

1. In Dual Ring Topology, two ring networks are formed, and data flow is in opposite direction in them. Also, if one ring fails, the second ring can act as a backup, to keep the network up.

Advantages of Ring Topology

1. Transmitting network is not affected by high traffic or by adding more nodes.
2. Cheap to install and expand.

Disadvantages of Ring Topology

1. Troubleshooting is difficult in ring topology.
2. Adding or deleting the computers disturbs the network activity.
3. Failure of one computer disturbs the whole network.
4. Adding or deleting the computers disturbs the network activity.
5. Failure of one computer disturbs the whole network.

Star topology:

Star topology is one of the most common network setups. Every node connects to a central network device in this configuration, like a hub, switch, or computer. The central network device acts as a server, and the peripheral devices act as clients.

Features of Star Topology

1. Every node has its own dedicated connection to the hub.
2. Can be used with twisted pair, Optical Fiber or coaxial cable.

Advantages of Star Topology

1. Fast performance with few nodes and low network traffic.
2. Hub can be upgraded easily.
3. Easy to troubleshoot.

Disadvantages of Star Topology

1. Cost of installation is high.
2. Expensive to use.
3. If the hub fails then the whole network is stopped because all the nodes depend on the hub.

MESH Topology

It is a point-to-point connection to other nodes or devices. All the network nodes are connected to each other.

Types of Mesh Topology

1.Partial Mesh Topology: In this topology some of the systems are connected in the same fashion as mesh topology but some devices are only connected to two or three devices.

2.Full Mesh Topology: Each and every nodes or devices are connected to each other.

Features of Mesh Topology

1. Fully connected.
2. Not flexible.

Disadvantages of Mesh Topology

1. Installation and configuration is difficult.
2. Cabling cost is more.

TREE Topology:

The tree network topology uses two or more star networks connected together. The central computers of the star networks are connected to a main bus. Thus, a tree network is a bus network of star networks.

Features of Tree Topology

1. Ideal if workstations are located in groups.
2. Used in Wide Area Network.

Advantages of Tree Topology

1. Extension of bus and star topologies.
2. Expansion of nodes is possible and easy.
3. Easily managed and maintained.
4. Error detection is easily done.

Disadvantages of Tree Topology

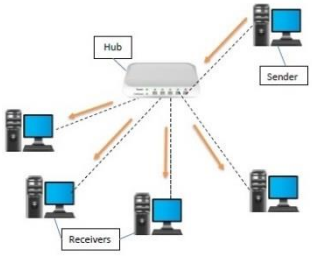
1. Heavily cabled.
2. Costly.
3. If more nodes are added maintenance is difficult.
4. Central hub fails, network fails

NIC: A network interface card (NIC) is a hardware component, typically a circuit board or chip, which is installed on a computer so it can connect to a network.

Hubs

A hub is a networking device which is used to connect multiple devices in a network. They are generally used to connect computers in a LAN.

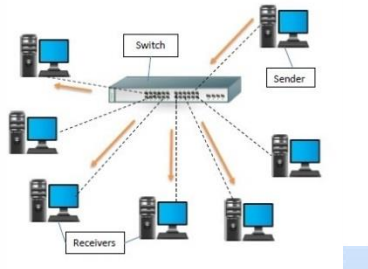
A hub has many ports in it. A computer which intends to be connected to the network is plugged in to one of these ports. When a data frame arrives at a port, it is broadcast to every other port, without considering whether it is destined for a particular destination or not.



Switches

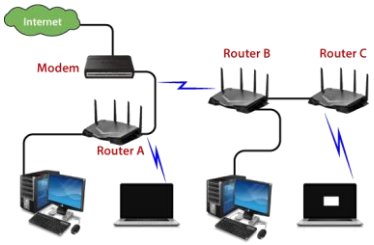
A switch is a networking device which connects devices in a network and uses packet switching to send and receive data over the network.

Like a hub, a switch also has many ports, to which computers are plugged in. However, when a data frame arrives at any port of a network switch, it examines the destination address and sends the frame to the corresponding device(s).



Modem:- Modem is a device that enables a computer to send or receive data over telephone or cable lines. ... The modulator converts digital data into analog data when the data is being sent by the computer. The demodulator converts analog data signals into digital data when it is being received by the computer.

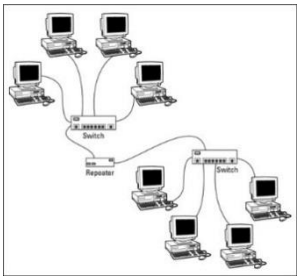
Router:- A router[a] is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet.



Data sent through the internet, such as a web page or email, is in the form of data packets. A packet is typically forwarded from one router to another router through the networks that constitute an internetwork (e.g. the Internet) until it reaches its destination node.[2]

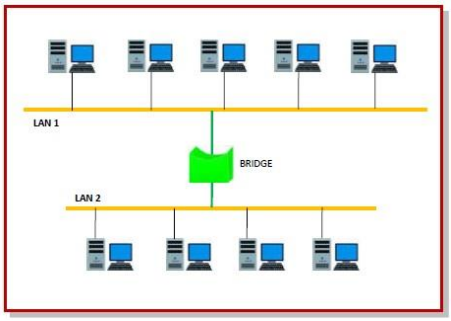
A router is connected to two or more data lines from different IP networks.[b] When a data packet comes in on one of the lines, the router reads the network address information in the packet header to determine the ultimate destination. Then, using information in its routing table , it directs the packet to the next network on its journey.

Repeater:- A repeater is an electronic device in a communication channel that increases the power of a signal and retransmits it, allowing it to travel further. Repeaters are used to extend transmissions so that the signal can cover longer distances.



Gateway:- A gateway is a network used to connects two networks with different transmission protocols together. It also acts as "gate" between two networks. Gateways serve as an entry and exit point for a network as all data must pass through or communicate with the gateway prior to being routed.

Bridge:- A bridge is a network device that connects multiple LANs (local area networks) together to form a larger LAN. The process of gathering networks is called network bridging. A bridge connects the different components so that they appear as parts of a single network.



What is a Computer Virus?

A computer virus is a program which can harm our device and files and infect them for no further use. When a virus program is executed, it replicates itself by modifying other computer programs and instead enters its own coding. This code infects a file or program and if it spreads massively, it may ultimately result in crashing of the device.

Types of Computer Virus

Discussed below are the different types of computer viruses:

- **Boot Sector Virus –** It is a type of virus that infects the boot sector of floppy disks or the Master Boot Record (MBR) of hard disks. The Boot sector comprises all the files which are required to start the Operating system of the computer. The virus either overwrites the existing program or copies itself to another part of the disk.

- **Direct Action Virus –** When a virus attaches itself directly to a .exe or .com file and enters the device while its execution is called a Direct Action Virus. If it gets installed in the memory, it keeps itself hidden. It is also known as Non-Resident Virus.
- **Multipartite Virus –** A virus which can attack both, the boot sector and the executable files of an already infected computer is called a multipartite virus. If a multipartite virus attacks your system, you are at risk of cyber threat.
- **Overwrite Virus –** One of the most harmful viruses, the overwrite virus can completely remove the existing program and replace it with the malicious code by overwriting it. Slowly-slowly it can completely replace the host's programming code with the harmful code.
- **Polymorphic Virus –** Spread through spam and infected websites, the polymorphic virus are file infectors which are complex and are tough to detect. They create a modified version of the existing program and infect the system and retain the original code.
- **File Infector Virus –** As the name suggests, it first infects a single file and then later spreads itself to other executable files and programs. The main source of this virus are games and word processors.

What is malware? What are its types?

Malware is a malicious software. Malware is disturbing software that is designed to damage and destroy computers and computer systems. Different types of Malware:

Viruses: Virus is a piece of software that can be attached to another program of file. Much like a human virus infects the body by attaching itself to a cell, a computer virus may attach itself to a file that is downloaded and installed on your computer. The virus spreads when the infected file is passed from system to system.

Worm: A computer worm is very similar to virus. Worm is capable of moving from system to system without any human action. Worms replicate themselves on your

system, attaching themselves to different files and looking for pathways between computers, such as a computer network that shares common file storage areas.

Spyware: Spyware may be spread like a virus or a worm, but spyware has a special classification because its purpose is to steal private information from your computer for a third party, like a spy. Spyware works in a number of different ways.

Adware: Adware is like the other forms of malware. Is purpose is to display those irritating pop-up advertisements. Adware can be bundled with legitimate software or can be hidden inside other software we download and install. This malware also commonly changes your browser settings.

Trojan: It is a type of malware that typically gets hidden as an attachment in an email or a free-to-download file, then transfers onto, the malicious code will execute the task the attacker designed it for, such as spy on user's online activity, or steal sensitive data.

Ransomware: Ransomware is a type of malware attack in which the attacker locks and encrypts the victim's data, important files and then demands a payment to unlock and decrypt the data.

Network communication media:-

Different media are employed for transmitting data from one computer terminal to the central computer or to other computer systems inside some kind of network.

There are two forms of communication media:

- Analog: Includes conventional radio, telephonic and television transmissions.
- Digital: Computer-mediated communication, computer networking and telegraphy

The most commonly used data communication media include:

- Wire pairs
- Coaxial cable
- Microwave transmission
- Communication satellites
- Fiber optics

The communication media acts as a channel for linking various computing devices so that they may interact with each other. Contemporary communication media facilitate communication and data exchange among a large number of individuals across long distances via email, teleconferencing, internet forums and many other forms of communication.

Network Protocols:-

A Protocol is set of rules, which the computers use to communicate with each other across a network.

Transmission Control Protocol: TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation through which application programs can exchange data. TCP works with the Internet Protocol (IP), which defines how computers send packets of data to each other.

Internet Protocol: It is a unique identifier of any computer on the internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet.

For example any IP address may be: 192.0.2.1

File Transfer Protocol

File Transfer Protocol enables file sharing between hosts, both local and remote, and runs on top of TCP. For file transfer, FTP creates two TCP connections: control and data connection. The control connection is used to transfer control information like passwords, commands to retrieve and store files, etc., and the data connection is used to transfer the actual file. Both of these connections run in parallel during the entire file transfer process.

Hypertext Transfer Protocol (HTTP):

Stands for "Hypertext Transfer Protocol." **HTTP** is the protocol used to transfer data over the web. It is part of the Internet protocol suite and defines commands and services used for transmitting webpage data. **HTTP** uses a server-client model. A client, for example, may be a home computer, laptop, or mobile device.

When you enter a URL in the browser, an HTTP command is sent to the Web server, and it transmits the requested Web Page. When we open a website using a browser, a connection to the web server is opened, and the browser communicates with the server through HTTP and sends a request. HTTP is carried over TCP/IP to communicate with the server. The server processes the browser's request and sends a response, and then the connection is closed. Thus, the browser retrieves content from the server for the user.

INTERNET :-

A means of connecting a computer to any other computer anywhere in the world via dedicated routers and servers. When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and computer programs.

Internet Requirements

- An Internet access account from an ISP o A computer
- A Modem connected to a telephone line
- Necessary software for connecting to the Internet and accessing information

Internet Service Provider (ISP)

ISPs worldwide offer various options and packages to the general public for internet access. ISP is the company which gives us the facility to gain access to the Internet against a fee. Some ISPs in India are:

- VSNL (Videsh Sanchar Nigam Limited)
- MTNL (Mahanagar Telephone Nigam Limited)
- Mantra Onlin
- Netcracker
- Satyam.

Application of Internet:-

Here are the internet applications listed below

- **Electronic Devices**

Electronic devices like wearables are installed with different sensors and software, which gather data and information of the user where data is processed to give required info about the user. The devices mainly used to monitor fitness, entertainment, and health. They mostly work on ultra-low power and available in small sizes.

- **Automated Digital Technology**

The automated digital technology has concentrated on the optimization of vehicles and their internal functions. the automated car is designed with special features that give a comfort zone to passengers with onboard sensors and internet establishment. Popular companies like Tesla, Apple, BMW, Google is yet to aboard their revolution in the automobile industry by installing excellent features.

- **Industrial Internet**

The industrial internet is investing in industrial engineering with Artificial intelligence and data analytics to build brilliant machines. The important moto is to build smart machines that are accurate and compatible with a human.

- **Smart City**

A smart city is another major implementation of the internet, which is employed for smart surveillance, water distribution, automatic transportation, environment monitoring. People are prone to pollution, improper supplies and shortage of sources, and the installation of traffic sensors solves irregular traffic flow, and the app is developed to report the municipal systems.

- **Smartphones**

Smartphones are also used for retailers and customers to stay connected for their business transactions, even out of the store. They have using Beacon technology to help business people to provide smart service to the client. They can track the products and enhance the store dashboard and deliver premium order before the scheduled date, even in congested traffic areas.

- **Major Application**

Another major application of the internet is in healthcare as it is smart medical systems installed to diagnose and cure the disease at an earlier stage.

Advantages of Internet:-

 Communication:-

The main advantage of internet is the faster communication than any other devices. Communication is the form of video calls, emails etc. Is possible using internet.

 Information:-

The internet is the source of knowledge. All kinds of information is present on internet. Information like education related, government laws etc.

 E- Commerce:-

All business deals can be carried in the internet like transaction of money etc. This is called E-Commerce.

Disadvantage of Internet:-

1) **Information Loss**:- The information and any important files can be easily taken by the hackers. There is not exact proof for the security for the details like account number, password etc.

2) **SPAM:-** The unnecessary emails , advertisement etc sometime are said to spam because they have the ability to slow down the system and makes users to face lots of problems.

3) **Virus Attacks**:- With the use of internet many virus enters in our computers. These viruses attack all files and delete them.

Domain Name System:-

With thousands of computers and millions of users, it would have been almost impossible to differentiate them, if there had been no addressing system. An addressing system was designed by the Internet Engineering Task Force (IETF). This addressing scheme assigns names and numbers to identify the computers on

the Internet. The names are called “Domain names” and numbers are called “IP addresses”. No two organizations can have the same domain name.

edu	Educational Institution
mil	Military Sites
gov	Government Departments
net	Networking Organisations
com	Commercial Organisations
int	International Institutions
org	Non-profit Organisations

An application layer protocol defines how the application processes running on different systems, pass the messages to each other.

- DNS stands for Domain Name System.
- DNS is a directory service that provides a mapping between the name of a host on the network and its numerical address.
- DNS is required for the functioning of the internet.
- Each node in a tree has a domain name, and a full domain name is a sequence of symbols specified by dots.
- DNS is a service that translates the domain name into IP addresses. This allows the users of networks to utilize user-friendly names when looking for other hosts instead of remembering the IP addresses.
- For example, suppose the FTP site at Edu Soft had an IP address of 132.147.165.50, most people would reach this site by specifying ftp.EduSoft.com. Therefore, the domain name is more reliable than IP address.

Internet Connectivity:-

a) Dial-Up Access:

Dial-up access is cheap but slow. A modem (internal or external) connects to the Internet after the computer dials a phone number. This analog signal is converted to digital via the modem and sent over a land-line serviced by a public telephone network.

b) Wireless.

Wireless, or Wi-Fi, as the name suggests, does not use telephone lines or cables to connect to the internet. Instead, it uses radio frequency. Wireless is also an always on connection and it can be accessed from just about anywhere. Wireless networks are growing in coverage areas .The range is between 5 Mbps to 20 Mbps.

c) Cable.

Cable provides an internet connection through a cable modem and operates over cable TV lines. There are different speeds depending on if you are uploading data transmissions or downloading. Cable speeds range from 512K to 20 Mbps.

The World Wide Web (WWW):-

World Wide Web, which is also known as a Web, is a collection of websites or web pages stored in web servers and connected to local computers through the internet. These websites contain text pages, digital images, audios, videos, etc. Users can access the content of these sites from any part of the world over the internet using their devices such as computers, laptops, cell phones, etc. The WWW, along with internet, enables the retrieval and display of text and media to your device.

Web Browser:-

A Web Browser is computer software application that allows people to browse websites on the internet. A web browser or simply browser enables users to view pages and to jump from one page to another. Some popular web browsers are: Internet Explorer, Google Chrome, Mozilla Firefox, Opera etc.

Navigation through web:-

Website navigation is the act of clicking and looking through resources on the internet, such as the various pages that make up a website. Users navigate websites

using a web browser and clicking on links that transport them to other pages when clicked. There are two kinds of links you might use for website navigation:

- Internal Links: Internal links connect to pages within the same website.
- External Links: These links connect to other websites.

You can organize your internal and external links within a menu framework, with hyperlinked text or through navigational buttons intersperse throughout the website to create an effective navigation experience for the user.

Uploading and Downloading:-

1. **Downloading** :Meaning of downloading is that our computer is receiving data from the Internet. When users are copying any file from the Internet to their device (computer, mobile, etc.), they download it. Example is downloading songs or pictures from the Internet.

2. **Uploading** : Meaning of uploading is that we send data from our computer to the Internet. In other words, to make a file visible to everyone on the Internet (like adding a picture on Facebook), you will need to upload it. Examples are posting photos on Instagram or Facebook, using a webcam.

Difference between Downloading and Uploading :

Downloading	**Uploading**
It is a procedure of copying files from the webserver to the machine.	It is a Procedure for copying data from the device to the webserver.
Memory is required in the user's device to downloading anything.	Memory is required in the webserver to upload anything.
Downloading speed is Comparatively High.	Uploading speed is Comparatively low.

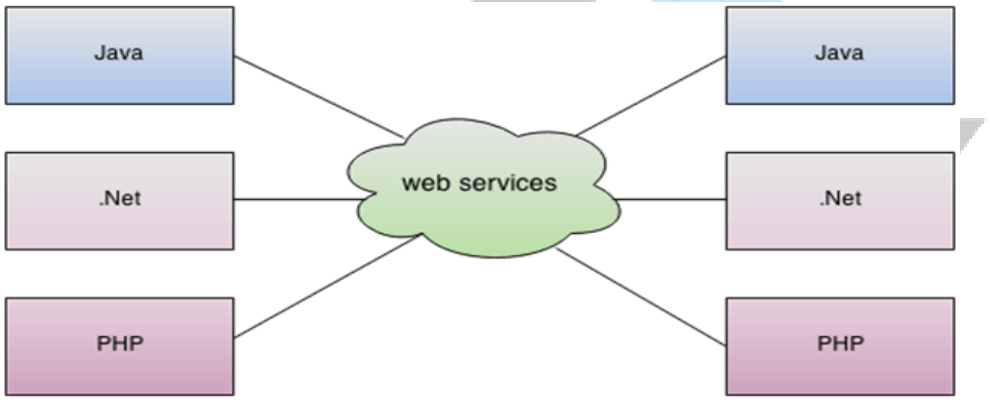
Data travels from the Web server to the user's device.	Data travels from user's device to the web server.

Services on web:-

A Web Service is can be defined by following ways:

- It is a client-server application or application component for communication.
- The method of communication between two devices over the network.
- It is a software system for the interoperable machine to machine communication.
- It is a collection of standards or protocols for exchanging information between two devices or application.

Let's understand it by the figure given below:



As you can see in the figure, Java, .net, and PHP applications can communicate with other applications through web service over the network. For example, the Java application can interact with Java, .Net, and PHP applications. So web service is a language independent way of communication.

Using Social Media Sites:-

Do you think you should be on social media but don't know where to start? What should you post, and how often should you post it? What's more powerful, a like or

a retweet? Here's what you need to know about the most popular social media platforms for professional settings, whether you are looking to expand your network, build a business or find a new gig. For example: Instagram, facebook, twitter, snapchat etc.

Electronic Mail (E-Mail)

Electronic Mail (E-Mail): Electronic mail is sending and receiving messages by computer on the Internet. E-mail is most widely used service on the internet. The messages are sent electronically. The message sent through e-mail instantaneously reaches to the recipient. E-mail message is sent to and received from the mail servers. When the sender sends the message, the mail server receives it and then it directs the message to the recipient computer.

E-Mail Address:-

Each user of email is assigned a unique name for his email account. This name is known as E-mail address. Different users can send and receive messages according to the e-mail address.

E-mail is generally of the form username@domainname. For example, webmaster@tutorialspoint.com is an e-mail address where webmaster is username and tutorialspoint.com is domain name.

- The username and the domain name are separated by @ (at) symbol.
- E-mail addresses are not case sensitive.
- Spaces are not allowed in e-mail address.

Creating a Mailing Account

There are many e-mailing sites like Gmail, mail.com, yahoo mail, fast mail, hush mail etc. Making account on these sites is almost similar so we will learn about how create a account on Gmail by following steps:

- Firstly go to the Google account creation page.
- Click on signup button.

- Enter first name, last name.
- Enter username that we will want to be our email address.
- Make a strong password by mixing letters, numbers and special characters and retype the password and click next.
- Enter your phone number to verify and click next.
- Then enter the OTP received on your phone number and click next.
- Then enter the required field like D.O.B. and other information and click finish.

So in this way your account is ready to use.

Composing and sending e-mail:-

Step 1: Open your computer, select a browser.

Step 2: Login your **Gmail account**, using Id and password.

Step 3: On the new page, click **Compose** (In the top left).

Step 4: A box appears on the screen, here in the **To** field, add recipients email id. (If you want, you can also add recipients in the **Cc** and **Bcc** fields)

Step 5: After that add a **subject**.

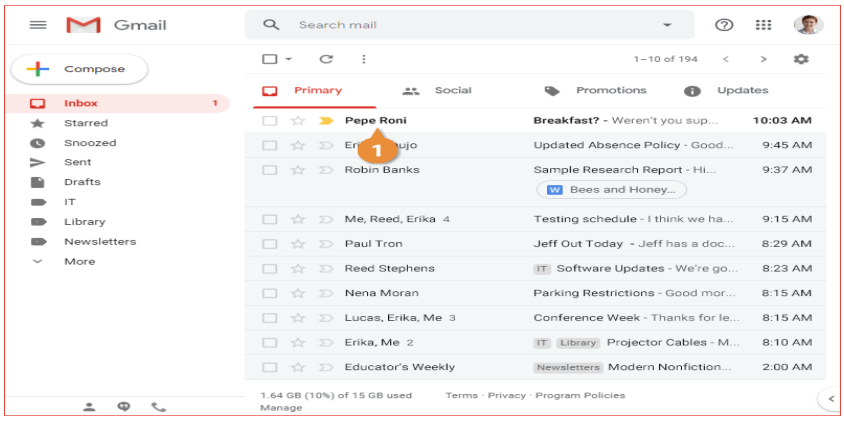
Step 6: In the body, write your **message**.

Step 7: At the bottom of the page, there is a send option-click **Send** to send mail.

Replying and forwarding:-

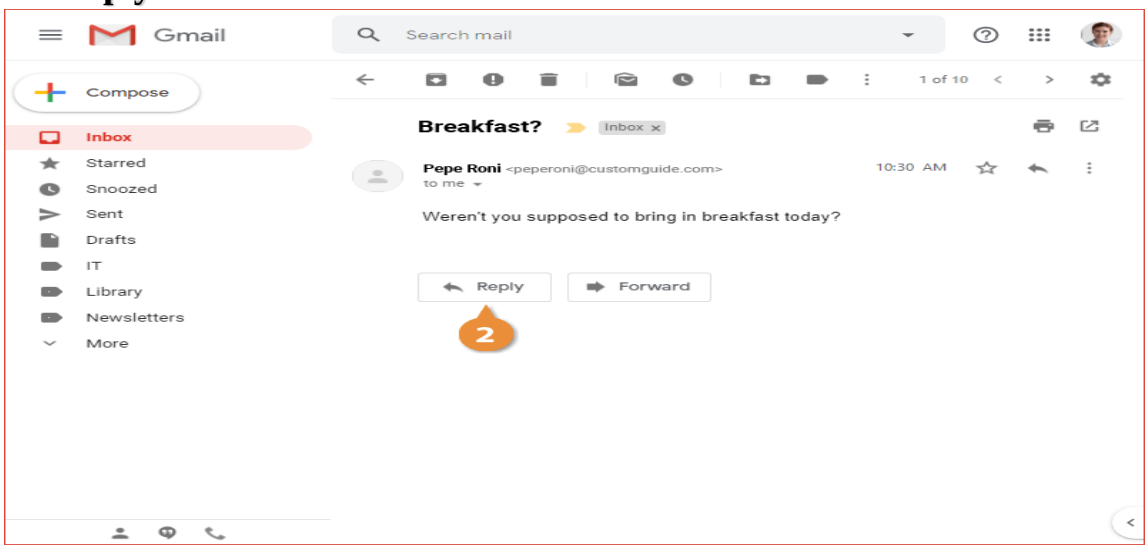
You can reply directly to the sender of any email you receive.

1. Open the email you want to reply to.



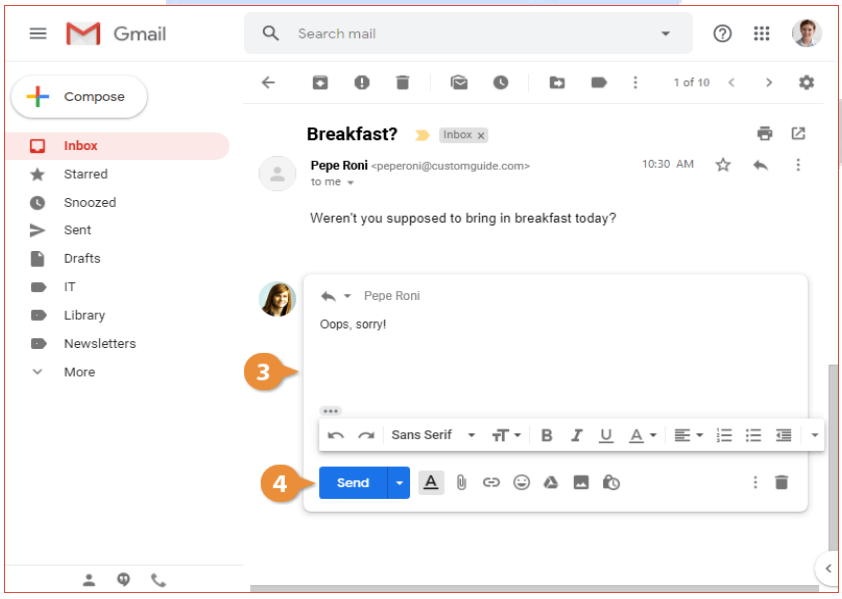
Reply and Forward buttons appear below the message body.

2. Click the **Reply** button.



A new reply appears below the original message, where you can enter your message.

3. Enter a reply message.
4. Click **Send**.



5. The reply is sent and appears in the thread below the original message.

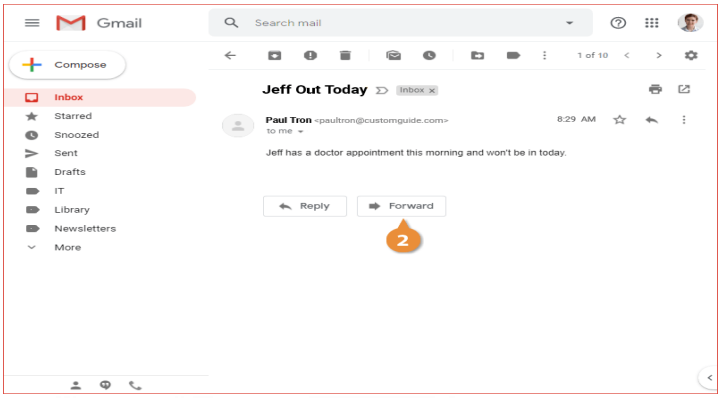
If a message has multiple recipients, you can include them all on your response. While viewing the email you want to reply to, click the **Reply All** button below the message. Enter a message, then click **Send**.

Forward an Email

You can also forward an email, which sends a copy of it to another person.

1. View the email you want to forward.
2. Click the **Forward** button.

   A new message starts, just like a reply, but this time with a field to address it to another recipient.

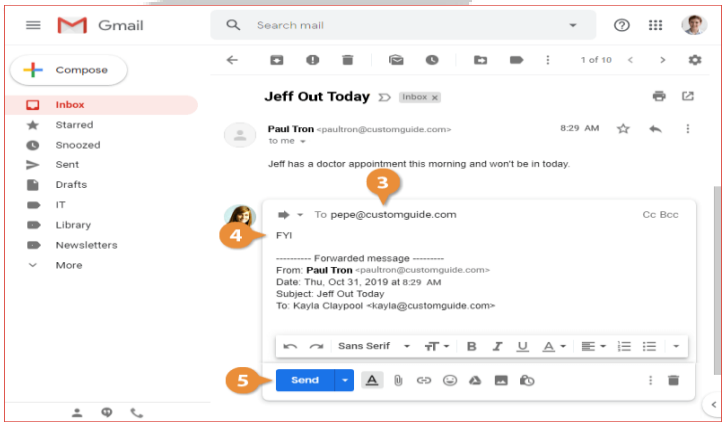


3. Enter the email address for the recipient.

   You can enter an additional message to go along with the forwarded email or leave the field blank to send the message by itself.

4. Enter a message (optional).
5. Click **Send**.

The email message is forwarded on to the specified person.



Structure of a Mail Message:-

An e-mail message is structured very much similar to a letter on paper. An e- mail is divided in three parts, the header, the body and the signature. The header, at the top of the message, is the envelope, the body is the actual message; the signature comes at the last.

Some common header lines are:

To : Mail-id of recipient(s).

Date : Date on which message was sent. Subject

: Subject (Title) of e-mail message. From

: The person(s) who sent the message.

Cc : Mail-ids of people who mailed carbon copy of the e-mail message.

Bcc : Mail-ids of people who mailed blanked carbon copy of the e- mail message.

SORTING MESSAGES:-

To sort messages in Outlook, click the column headers above the messages, such as **Subject**, **From** or **Received** (see the image below). For example, if you click on **Received**, the program will sort the messages according to the date they were received.

If you click the same button again, the application will sort the messages in reverse order. The same principle usually also applies to other similar buttons.

SEARCHING MESSAGES:-

You can use the **Outlook search operation** for quick searches in an open message folder. The search field is the box shown above the list of e-mails that contains the text **Search Current Mailbox**.

When you type the search term in the search box, the program will display the messages that match your search. To return to normal view, click the X to the right of the search field or the **Close Search** button in the menu bar.

Sending e-mail to multiple users:-

When using your personal ESP, you can send emails to multiple recipients by using the Cc and Bcc fields:

1. Once you have composed your email, type the email address of your primary recipient/s into the "address" field.
2. Separate multiple addresses with a comma.
3. If you wish to send copies to more people, type the email addresses in the Cc field.

This might not be appropriate in the context of a marketing campaign. Therefore, you might want to use the Blind Carbon Copy (Bcc) field instead. This ensures that the other recipients do not know who else you have sent the email to:

1. Compose your email.
2. Instead of using the primary "address" or Cc field, enter all your recipients' email addresses in the Bcc field.

Sending attachments:-

1. On your Android phone or tablet, open the Gmail app .
2. Tap Compose .
3. Tap Attach .
4. Tap **Attach file** or **Insert from Drive**.
5. Choose the file you want to attach.

Tip: For some file types, like ZIP files, you'll need to download a file manager from Google Play before you can attach them.

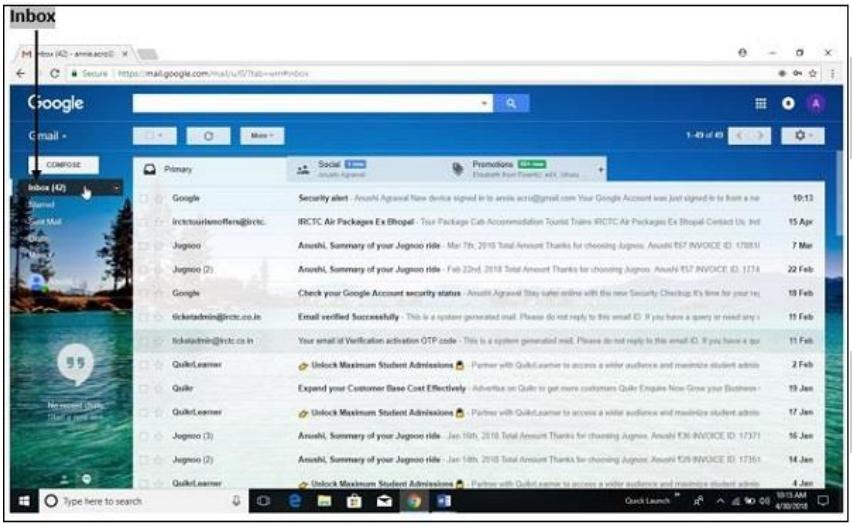
Remove an attachment:After you add an attachment, you can remove it. To the right of the attachment name, tap Close ×.

Attachment size limit

- Gmail account: 20 MB
- Non-Gmail account: Up to 25 MB, depending on your email provider.

Mailbox: Inbox and Outbox

Inbox − Inbox is an area where you can see all the received mails.



Outbox − Outbox is an area where the outgoing messages or messages which are in process of sending or which are failed to send are stored.

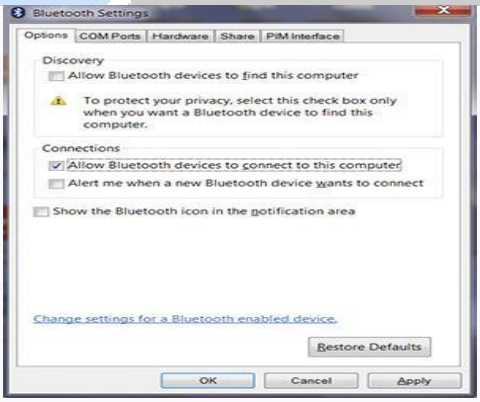
Sent mail − Sent mail is an area to view all the sent or successfully delivered mails.

Using Bluetooth for Connecting Devices from Mobile Phones to Headphones:-

- Step 1: Put your earphones in the pairing mode. The initial step is to put your earphones in pairing mode. ...
- Step 2: Go to Settings - Bluetooth on your phone. ...
- Step 3: Scan for new devices under the Bluetooth category. ...
- Step 4: Select your device and connect. ...
- Step 5: Play your favorite music.

Using Bluetooth for connecting devices from computer mouse to computers:-

1. Click the Start button and then click Control Panel.
2. In the Control Panel search box, type 'Bluetooth', and then click Change Bluetooth settings.
3. In the Bluetooth Settings dialog box, click the Options tab, select the Allow Bluetooth devices to connect to this computer check box, and then click OK.



Remove and reinstall the Bluetooth device that's causing problems using the following steps:

1. Click the Start button, then click Control Panel. In the Control Panel window, click Hardware and Sound, then click Devices and Printers.
2. In the list of devices, select the Bluetooth device that isn't working and click Remove device and click Yes to confirm.
3. Click Add a device, then on the Bluetooth device, press the reset button or make it discoverable according to the device's user manual.
4. Click the Bluetooth device you want to add to your computer, and then click Next
5. Follow the rest of the steps that appear on screen.

6. You may be asked to enter a pairing code (also known as a PIN or passcode). Most Bluetooth devices need to be paired with your computer before they can transfer information to each other. This stops unauthorised wireless devices from connecting with your computer.
7. The device should now automatically reconnect each time you move it near your computer.

Connecting to Internet using Mobile Hotsot:-

1. On the other device, open that device's list of Wi-Fi options.
2. Pick your phone's hotspot name.
3. Enter your phone's hotspot password.
4. Click Connect.

If you don't want your hotspot to require a password:

1. Swipe down from the top of the screen.
2. Touch and hold Hotspot .
3. Under "Security," tap None.

Connecting to Internet using Wifi:-

1. Select the Network icon on the far right side of the taskbar. ...
2. On the Wi-Fi quick setting, select Manage Wi-Fi connections (>).
3. Choose the Wi-Fi network you want, then select Connect.
4. Type the network password, and then select Next.

Need of Security over Internet:-

Web security is important to keeping hackers and cyber-thieves from accessing sensitive information. Without a proactive security strategy, businesses risk the spread and escalation of malware, attacks on other websites, networks, and other IT infrastructures.

Security Threats:-

- Computer Viruses. Computer viruses are the most common among internet security threats out there. ...

- Malware. ...
- Phishing. ...
- Botnets. ...
- Distributed Denial of Service (DDoS) ...
- Trojan Horse. ...
- SQL Injection Attack. ...
- Rootkit.

1**. Malware** – Surveillanceware and Ransomware

Malware stands for malicious software and is the catchall term for any piece of software designed to either damage devices or (as is more common) steal important data.
There are many types of malware that can affect your system. Some of the most common include trojans, viruses, ransomware, nagware, adware, spyware and worms.

2. **Phishing** – Email and mobile

With phishing attacks, fraudsters pose as reputable companies and send false communications in order to trick people into revealing their personal information or clicking on a malicious link.Phishing used to be mostly coordinated through emails. But as more people are using their personal mobile devices to access corporate networks, mobile phishing has taken over as the most popular route for phishing attacks.

3. **Threat Actors - Hackers**

Hackers are the individuals behind all these threats, creating malware and deploying phishing emails. They specifically like to prey on smaller businesses, because of their often limited security capacity, and the role they play in the wider supply chain.

Virus

Virus is a program written to enter to your computer and damage/alter your files/data. A virus might corrupt or delete data on your computer. Viruses can also replicate themselves. A computer Virus is more dangerous than a computer worm as it makes changes or deletes your files while worms only replicates itself with out making changes to your files/data.

Examples of virus are:

W32.Sfc!mod

ABAP.Rivpas.A

Accept.3773

E-mail spam:-

Email spam, also known as junk email, refers to unsolicited email messages, usually sent in bulk to a large list of recipients. Spam can be sent by real humans, but more often, it is sent by a botnet, which is a network of computers (bots or spambots) infected with malware and controlled by a single attacking party (bot herder). Apart from email, spam can also be distributed via text messages or social media.

Email spam senders, or spammers, regularly alter their methods and messages to trick potential victims into downloading malware, sharing data or sending money.

Spam emails are almost always commercial and driven by a financial motive. Spammers try to promote and sell questionable goods, make false claims and deceive recipients into believing something that's not true.

The most popular spam subjects include the following:

- pharmaceuticals
- adult content
- financial services
- online degrees
- work-from-home jobs
- online gambling
- cryptocurrencies

Security and privacy issues related to online shopping and social networking sites

1. Data mining

Data is the bread and butter of social media platforms. They do everything based on your information – tailor their services, serve ads, analyze the market, build business models, etc. Some data you've given to them is personal, like your name, email addresses, date of birth, or where you live. But other kinds of data, like your likes and dislikes, photos, and posts, can paint a picture of who you really are too.

2. Privacy setting loopholes

Data privacy is an important issue. Most social media companies amended their privacy policies in response to stricter privacy laws and regulations in Europe. They now allow you to tweak your settings and make your accounts more private.

Most of the time, something you shared with a closed group of friends gives them the ability to share it with others. Your friend's friends can then see the content you posted, which might not be your intention. Your friends might not even have stringent privacy policies, meaning that others can now access information that was supposed to stay within your friends' circle.

3. Location settings

Pay attention to location settings when you use social media sites and apps. Some might be tracking your whereabouts Your location might not seem like a very valuable piece of data. However, when paired with your other personal information, it could help to create an even more accurate user profile.

4.Hacking

Social media accounts are an excellent target for hackers for many reasons. For example, they can Gather information from your social media profiles and use it to

break into your accounts. Posting photos of your dog and then using his name as a password is one of many easy tricks.

5.Harassment, cyberbullying, and impersonation

Social media can also be used for cyberbullying or cyberstalking. The perpetrators don't even need to be hackers. They can be infatuated colleagues sending threatening messages or your kid's classmates bombarding them with inappropriate comments. It could also be your ex-partner who shared private information about you online or even hacked into your account and messaged your colleagues and friends to ruin your reputation.

Social media safety

1. Establish strong passwords

Implementing strong passwords is the easiest thing you can do to strengthen your security.

Cloutier shares his tip for crafting a hard-to-crack password: use a combination of capital and lower-case letters, numbers and symbols and make it 8 to 12 characters long.

According to Microsoft, you should definitely avoid using: any personal data (such as your birthdate), common words spelled backwards and sequences of characters or numbers, or those that are close together on the keyboard.

2. **Put up a strong firewall**

In order to have a properly protected network, "firewalls are a must," A firewall protects your network by controlling internet traffic coming into and flowing out of your business. 3. Install antivirus protection

Antivirus and anti-malware software are essentials in your arsenal of online security weapons, as well.

"They're the last line of defense" should an unwanted attack get through to your network, Cloutier explains. Statistics.

How to protect your privacy on social media

- Don’t overshare; only provide the necessary information. You don’t always need to provide your address or date of birth to create accounts.
- Use strong passwords, don’t reuse them, and keep them safe in a password manager, like NordPass.
- Don’t use social media on public devices, but if you do, always remember to log out when you’re done.
- Disable geolocation data on your apps.
- Don’t trust suspicious links, even if you get them from your friends.

Firewalls

The firewall mechanism is used to protect our network/Internet/Web Servers against unauthorized access coming from Internet. Basically a firewall separates a protected network from an unprotected one, the Internet. A firewall can be hardware, software, or both.
Kaspersky Anti-Virus, and Zone Alarm Antivirus.

Learn safety measures of safe browsing

1.Install and use antivirus software : Antivirus software will detect and remove viruses as well as prevent any new infections. Do your research, choose a software program that fits your needs, and use it.

2.Use a firewall :A firewall is an application that protects your computer from hackers gaining unauthorized access to your computer. Setting up a personal firewall will dramatically reduce the possibility of your computer being attacked by Internet threats.

3.Update your security software : It’s not enough to install security software one time; you must install each update as it is made available. Cyber criminals are constantly finding new ways to infiltrate systems and launch new threats, and security software developers release updates to combat this trend.

4.Bookmark important sites : If there are sites you visit regularly, it’s a good idea to bookmark them in your browser. A mistyped address could take you to a

false site with malicious code that can harm your computer and compromise your information.
Bookmarked addresses take you to the same site every time.

Safe browsing:-

Google Safe Browsing helps protect over four billion devices every day by showing warnings to users when they attempt to navigate to dangerous sites or download dangerous files. Safe Browsing also notifies webmasters when their websites are compromised by malicious actors and helps them diagnose and resolve the problem so that their visitors stay safer. Safe Browsing protections work across Google products and power safer browsing experiences across the Internet.

What is cloud?

"The cloud" refers to servers that are accessed over the Internet, and the software and databases that run on those servers. Cloud servers are located in data centers all over the world. By using cloud computing, users and companies do not have to manage physical servers themselves or run software applications on their own machines.

Cloud storage:-

> Cloud storage is a cloud computing model that stores data on the Internet through a cloud computing provider who manages and operates data storage as a service. It's delivered on demand with just-in-time capacity and costs.

Benefits of local storage:-

- **Speed:** Storing data on external hard drives is faster than uploading data to the cloud.
- **Security:** You have complete control over how the data is stored, who has access, and information security protocols.

- **Capacity:** One of the major advantages of local storage is capacity. While 10GB is definitely a good amount for cloud storage, a hard drive can provide easily 2TB.
- **Survivor:** Local storage is also not reliant on internet connection. Once saved on-premise and need access to it, you will find it straight away.

Benefits of cloud storage:-

- **Cost-effective:** Buying physical storage or hardware can be pricey. Cloud storage is cheaper than using external drives.
- **Security:** Cloud storage is safer than the local storage of the use of encryption algorithms. Only **authorized personnel** such as you and your employees to have access to the documents and files stored in the cloud. This adds an extra layer of protection.
- **Accessibility:** The Cloud gives you access to your files from anywhere. The only thing you will need is an internet connection.
- **Recovery:** In case of a hard drive failure or other hardware malfunction, the files can be accessed on the cloud. This acts as a backup solution for your local storage on physical drives.
- **Updating:** When working with cloud storage, every time you make changes to a file, these will be updated and synced on all of your devices. This just makes life and your job a little bit easier.

Types of cloud storage:-

1. Private cloud storage:

Private cloud storage is also known as enterprise or internal cloud storage. Data is stored on the company or organization's intranet in this case. This data is protected by the company's own firewall. Private cloud storage is a great option for companies with expensive data centers and can manage data privacy in-house. A major advantage of saving data on a private cloud is that it offers complete

control to the user. On the other hand, one of the major drawbacks of private cloud storage is the cost and effort of maintenance and updates. The responsibility of managing private cloud storage lies with the host company.

2. Public cloud storage:

Public cloud storage requires few administrative controls and can be accessed online by the user and anyone else who the user authorizes. With public cloud storage, the user/company doesn't need to maintain the system. Public cloud storage is hosted by different solution providers, so there's very little opportunity for customizing the security fields, as they are common for all users. Amazon Web Services (AWS), IBM Cloud, Google Cloud, and Microsoft Azure are a few popular public cloud storage solution providers. Public cloud storage is easily scalable, affordable, reliable and offers seamless monitoring and zero maintenance.

3. Hybrid cloud storage:

Hybrid cloud storage is a combination of private and public cloud storage. As the name suggests, hybrid cloud storage offers the best of both worlds to the user – the security of a private cloud and the personalization of a public cloud. In a hybrid cloud, data can be stored on the private cloud, and information processing tasks can be assigned to the public cloud as well, with the help of cloud computing services. Hybrid cloud storage is affordable and offers easy customization and greater user control.

4. Community cloud storage:

Community cloud storage is a variation of the private cloud storage model, which offers cloud solutions for specific businesses or communities. In this model, cloud storage providers offer their cloud architecture, software and other development tools to meet the community's requirements. Any data is stored on the community-owned private cloud storage to manage the community's security and compliance needs. Community cloud storage is a great option for health, financial or legal companies with strict compliance policies.

Cloud storage service:-

- Store any file or folder:No matter the file or folder you're trying to save—from photos and videos to large CAD files and PowerPoint presentations—you can store it safely using cloud storage solutions from Dropbox.

- Access your files from multiple devices:Dropbox offers one central hub for online file storage, file sharing, and syncing. Whether you're at work or on the road, your files are synced across your devices and accessible in real time. Access your Dropbox account with desktop apps on Windows and Mac, our mobile app for iOS or Android devices, and on the web through your browser.

- Protect your data: If your device is lost or stolen, rest easy knowing your data's safe. Remote wipe lets you clear all the files and folders from your missing device's Dropbox account. All of your files are securely saved in cloud storage and easily retrievable.
- Recover your files:Accidentally delete a file or save a new version of a file you're not happy with? No problem. Dropbox stores copies of all deleted files and folders for 30 days—or as many as 180 days for Dropbox Standard, Advanced, and Enterprise plans—including previous versions of files, so you can HYPERLINK "https://www.dropbox.com/features/cloud-storage/file-recovery-and-history" easily recover them. We also provide confirmation warnings on the desktop when team members move or delete files. They'll know what happens when they take action, and fewer files will be lost accidentally.

- **Get the right amount of storage space for you:**Need more storage space? Dropbox has a range of cloud storage solutions that will offer you the right amount of online storage—no matter how much you need.

Electronic governance or **e-governance** is the application of information and communication technology (ICT) for delivering government services, exchange of information, communication transactions and services between government-to-citizen (G2C), government-to-business (G2B), government-to-government (G2G),government-to-employees (G2E) as well as back office processes and interactions within the entire government framework.

- **SCOPE OF E-GOVERNANCE**:

 Government to Citizen (G2C)
 Citizen to Government (C2G)
 Government to Government (G2G)
 Government to Business (G2B)

 Government to Citizen:

The G2C relation will include the services provided by the Government to the Citizens. These services include the public utility services i.e. Telecommunication, Transportation, Post, Medical facilities, Electricity, Education and also some of the democratic services relating to the citizenship such as Certification, Registration, Licensing, Taxation, Passports, ID Cards etc.

 Citizen to Government:

Citizen to Government relationship will include the communication of citizens with the Government arising in the Democratic process like voting, campaigning, feedback, etc.

1. E-Democracy - The true concept of Democracy includes the participation of the citizens in the democratic and governing processes. The ICT can help enable the true democratic process including voting, public opinion, feedback and Government accountability.

3. **E-Feedback** - E-Feedback includes the use of ICT for the purpose of giving feedback to the Government. Use of ICT can enable online feedback to the Government, online debates as to the Government services.

 Government to Government

G2G relationship would include the relationships between Central and State Government and also the relationship between two or more Government departments.

1. E-administration - E-administration would include the implementation of ICT in the functioning of the Government, internally and externally. It can substantially reduce paperwork if properly used.

2. E-police - The concept of E-police is little different from Cyber-Police. Cyber Police require technology experts to curb the electronic/cybercrimes. E-police refers to the use of ICT for the purpose of facilitating the work of the Police department in investigation and administration. The concept of E-police includes databases of Police Officers, their performances, Criminal databases.
50

 Government to Business

1. E-Taxation - Corporate sector pays many taxes, duties and dues to the Government. Payment of these taxes and duties will be made easier by ETaxation. Online taxing and online payment of taxes can help reduce cost and time required for physical submission of taxes.

2. E-Licensing - Companies have to acquire various licenses from the Government, similarly the companies have to acquire various registrations.

3. E-Tendering - E-Tendering will include the facilities of online tendering and procurement. It wills online alerts as to new opportunities of business with the Government and also online submission of tenders and online allotment of work.

Digital Financial Services:

Digital financial services (DFS) can expand the delivery of basic financial services to the poor through innovative technologies like mobile-phone-enabled solutions, electronic money models and digital payment platforms.

Applications of Digital Financial Services:

- **Electronic banking (e-banking)**
  Electronic banking, which is also known as electronic fund transfer (EFT), refers to the transfer of funds from one account to another through electronic method like ATM, debit cards, credit cards.
- **Mobile banking (M-BANKING)**

The connection between a mobile phone and a personnel or business bank account. Mobile banking allows customers to use their mobile phone as another channel for their banking services, such as deposits, withdrawals, account transfer, bill payment, and balance inquiry. Advantages to mobile banking include the ability to bank anywhere and at any time.

- **Mobile Money Transfer (MMT**): Services whereby customers use their mobile device to send and receive monetary value - or more simply put, to transfer money electronically from one person to another using a mobile phone. Both domestic transfers as well as international, or cross-border, remittances are money transfer services.
- **Mobile Payments**: While MMT addresses person-to-person money transfers, mobile payments refer to person-to-business payments that are made with a mobile phone.
- **Mobile network operator (MNO):** A company that has a government-issued license to provide telecommunications services through mobile devices. An MNO is also known as a Telco.

What is saving

Saving is **the portion of income not spent on current expenditures**. In other words, it is the money set aside for future use and not spent immediately.

Benefits of savings:

- **It offers peace of mind:** Knowing that you have a certain amount accumulated for times of your need, gives you peace of mind. You can lead a stress-free life with the knowledge that you will not have to struggle if things take an unexpected route.
- **It gives you a better future:** Your savings can be the answer to a number of your goals. You can buy a house, accumulate funds for your retirement, or purchase a vehicle. You can secure your future, indulge in the best of things that life has to offer and live a very fulfiling life.
- **It provides for your children's education:** With a considerable amount of savings, you can fuel your children's dreams and pay for the best schools and colleges across the world.
- **You can plan your short-term goals:** Savings are not just aimed at the long term. You can also benefit from savings in the short term. A lot of people save for a few months and then travel.

- **It gives your family security in case of an unfortunate event:** By saving in a disciplined manner, you can make sure that your family is well-provided for. In unfortunate times, your savings can act as a cushion for your loved ones and help them overcome any financial difficulty.

Type of bank Accounts.

1.Current account

A current account is a deposit account for traders, business owners, and entrepreneurs, who need to make and receive payments more often than others. These accounts hold more liquid deposits with no limit on the number of transactions per day. Current accounts allow overdraft facility, that is withdrawing more than what is currently available in the account.

2.Savings account

A savings bank account is a regular deposit account, where you earn a minimum rate of interest. Banks offer a variety of Savings Accounts based on the type of depositor, features of the product, age or purpose of holding the account.There are regular savings accounts, savings accounts for children, senior citizens or women, institutional savings accounts, family savings accounts, and so many more.

3. Salary account

Among the different types of **bank accounts, y**our salary account is the one you have opened as per the tie-up between your employer and the bank. This is the account, where salaries of every employee are credited to at the beginning of the pay cycle. Employees can pick their type of salary account based on the features they want. The bank, where you have a salary account, also maintains reimbursement accounts; this is where your allowances and reimbursements are credited to.

4. Fixed deposit account

A fixed deposit (FD) account allows you to earn a fixed rate of interest for keeping a certain sum of money locked in for a given time, that is until the FD matures. FDs range between a maturity period of seven days to 10 years. The rate of interest you earn on FDs will vary depending on the tenure of the FD. Generally, you cannot withdraw money from an FD before it matures. Some banks offer a premature withdrawal facility. But in that case, the interest rate you earn is lower.

5. Recurring deposit account

A recurring deposit (RD) has a fixed tenure. You need to invest a fixed sum of money in it regularly -- every month or once a quarter -- to earn interest. Unlike FDs, where you need to make a lump sum deposit, the sum you need to invest here is smaller and more frequent.

6. NRI accounts

There are **different types of bank accounts** for Indians or Indian-origin people living overseas. These accounts are called overseas accounts. They include two types of savings accounts and fixed deposits -- NRO or non-resident ordinary and NRE or non-resident external accounts. Banks also offer foreign currency non-resident fixed deposit accounts. Let us quickly see the **various types of bank accounts** for NRIs-

Digital financial products:-

ATM: Automated teller machines (ATMs) are **electronic banking outlets** that allow people to complete transactions without going into a branch of their bank. Some ATMs are simple cash dispensers, while others allow a variety of transactions such as check deposits, balance transfers, and bill payments.

Cash deposit machines

The Cash Deposit Machine, better known as Automated Deposit cum Withdrawal Machine (ADWM) is **an ATM like machine that allows you to deposit cash directly into your account using the ATM cum debit card**. You can use this machine to instantly credit your account without visiting the branch.

Cards

1. Credit cards:

- allow the cardholder to spend up to a specified credit limit
- offer the account holder an interest-free period
- require the account holder to repay at least the minimum amount each month, but charge interest on the unpaid balance
- incur no interest if the bill is paid in full by the specified date

2. Debit cards:

- Are issued in conjunction with a bank or building society current account
- limit the cardholder to the funds available in that account plus any overdraft, if available

3. Purchasing cards:

- are generally restricted to buyers for large businesses or public sector bodies
- are designed to cut down on paperwork and the need for purchase orders

What are Digital Payments?

Digital payments are transactions that take place via digital or online modes, with no physical exchange of money involved. This means that both parties, the payer and the payee, use electronic mediums to exchange money.

1: Banking Cards

Indians widely use Banking cards, or debit/credit cards, or prepaid cards, as an alternative to cash payments. Andhra Bank launched the first credit card in India in 1981.

Cards are preferred because of multiple reasons, including, but not limited to, convenience, portability, safety, and security.

2: Unstructured Supplementary Service Data(USSD)

USSD was launched for those sections of India's population which don't have access to proper banking and internet facilities. Under USSD, mobile banking transactions are possible without an internet connection by simply dialing *99# on any essential feature phone.

3. Mobile Wallets: A mobile wallet is a type of virtual wallet service that can be used by downloading an app. The digital or mobile wallet stores bank account or debit/credit card information or bank account information in an encoded format to allow secure payments. One can also add money to a mobile wallet and use the same to make payments and purchase goods and services. This eliminated the need to use credit/debit cards or remember the CVV or 4-digit pin.

4. Internet Banking: Internet banking refers to the process of carrying out banking transactions online. These may include many services such as transferring funds, opening a new fixed or recurring deposit, closing an account, etc. Internet banking is also referred to as e-banking or virtual banking. Internet banking is usually used to make online fund transfers via **NEFT**, RTGS or IMPS. Banks offer customers all types of banking services through their website and a customer can log into his/her account by using a username and password.

5. Mobile Banking: Mobile banking is referred to the process of carrying out financial transactions/banking transactions through a smartphone. The scope of mobile banking is only expanding with the introduction of many mobile wallets, digital payment apps and other services like the UPI. Many banks have their own apps and customers can download the same to carry out banking transactions at the click of a button. Mobile banking is a wide term used for the extensive range or umbrella of services that can be availed under this.

6. Bharat Interface for Money (BHIM) app: The BHIM app allows users to make payments using the UPI application. This also works in collaboration with UPI and transactions can be carried out using a VPA. One can link his/her bank account with the BHIM interface easily. It is also possible to link multiple bank accounts. The BHIM app can be used by anyone who has a mobile number, debit card and a valid bank account. Money can be sent to different bank accounts, virtual addresses or to an Aadhaar number.

Security Measures You Need To Take When Using Digital Payments

Regularly check your financial statements.

A lot of consumers fail at the most basic security measure for digital payments, which is to check your statements. If you do this regularly, you'll spot any inconsistencies.

Turn on two-factor authentication.

With hacking attacks on the rise, consumers should turn on SMS-based two-factor authentication to protect account takeovers that can lead to payment fraud. Even if a user's original password is leaked or stolen, only the user receives the one-time password code via SMS that's needed to log in to a digital payment app or site.

Verify your payment recipient.

One simple but crucial operational security measure that everyone needs to practice with digital payments is recipient verification. Many digital payment systems lack the checks and balances we're used to with more traditional payments. If you send money to the wrong address/person it can be lost forever.

Use biometric authentication when possible.

Ensure a secure authentication method is chosen. If the authentication method is based solely on convenience, then it's likely convenient to thieves too (e.g., not requiring a pin for credit card transactions). Use a biometric when possible, as this authentication method requires something unique to each person and reduces the chances of stolen credit cards or phones being useful to thieves

Double-check QR codes.

Before scanning a QR code—especially one on printed material in a public place—make sure it hasn't been pasted over with a different (and potentially malicious) code. Hackers can easily replace a legitimate QR code used for payment (at a point of sale, ATM, parking meter, etc.) with a malicious QR code that will expose your banking or financial account information when scanned.

Take advantage of one-time passwords.

As I am traveling to India right now, I understand the value of one-time passwords. It was annoying earlier but it is a security factor we all need to adhere to. Our security matters when one-two-three-step authentication is implemented. We need to live with it for our security.

Be cautious with linked checking accounts.

Consumers are generally well-protected from fraud liability when using linked credit card accounts, but the same is not always true of linked checking accounts. When using checking account-linked services, consumers can protect themselves from losses by linking to a secondary account that maintains a lower balance.

Don’t reuse passwords.

New breaches happen a lot, and stolen credentials often show up in underground markets. Once a criminal acquires stolen data, they could potentially access any other accounts protected by the same username and password. Stop reusing passwords and monitor your credentials for exposure with one of the free tools that will check them against a continuously updated collection of breached data

Submit minimal personal information.

Submit only the absolute minimum of personal information. If overly invasive and unnecessary details are being asked for, think twice. The financial risk is generally covered by banks or other financial institutions, but identity theft protection is left up to the individual.

What is a smartphone simple definition?

A smartphone is a cellular telephone with an integrated computer and other features not originally associated with telephones such as an operating system, web browsing, and the ability to run software applications.Smartphones can be used by individuals in both a consumer and a business context, and are now almost integral to everyday modern life.

Connect to Wi-Fi networks on your Android device

To use Wi-Fi the way you want, you can change how and when your phone connects.When you have Wi-Fi turned on, your phone automatically connects to nearby Wi-Fi networks you've connected to before. You can also set your phone to automatically turn on Wi-Fi near saved networks.

Turn on & connect

1. Open your device's Settings app.
2. Tap **Network & internet** › **Internet**.

3. Tap a listed network. Networks that require a password have a Lock .

Tip: After you connect, the network is "Saved." When your phone is near and Wi-Fi is on, your phone automatically connects to this network.

What is mobile data?

Mobile data is the distribution of digital data through wireless networks. It's the invisible connection—usually to a satellite or a nearby cell tower—that allows you to visit websites and use apps on your cell phone or tablet, even while you're out and about.Mobile data is fundamentally different from WiFi. With WiFi, there's a data connection to a local hub like a modem; this connection is then transmitted via WiFi router. The transmission signal is localized and only available if you're within close range of the router itself.

How much cell data do I have?

You use data whenever you access the Web on your phone. Depending on your contract details, you may have a limited or unlimited amount each month. Or you might have no contract, and instead pay as you go via mobile data top-ups.

Your cell phone provider can tell you how much data you have on your plan. You can also check your phone's Settings menu. There should be a Cellular section that tells you how much data you've used and how much you have available.

What uses mobile data?

Most often, mobile data is used up in one of three ways.

Emails, texts, and direct messages. These all use mobile data. How much depends largely on what you send and how you send it. Emails with high-resolution photos attached will take a lot of data, while a short text saying "I'm here" won't take much at all.

Web browsing. Surfing the Web on mobile takes quite a bit of data. This makes sense given the pages you visit might have large images or videos. But a lot of this browsing data is actually used up by ads and unseen trackers. Blocking this stuff doesn't just remove unwanted clutter—it can actually save phone data.

Apps. Apps are likely the biggest data users on your phone. Anything that needs to connect to the Web to update, refresh, or download will use cell data. This means all your social media and streaming apps, from Facebook to Twitter, Spotify to Netflix, will quietly eat up your data.

Mobile data is what allows your phone to get online when you're away from Wi-Fi. Mobile-enabled devices can send and receive information over a wireless cellular connection

Turn on/off mobile data

Go to **Settings > Network & Internet > Mobile data > Data Usage**

Connect a device to your Google Account

You can quickly find your favorite places or get better search results when you connect a device to your Google Account.If your phone or tablet doesn't show up when you select **Send to your phone,** you might need to connect your device to your Google Account.

Connect a device

Sign in to the same Google Account on your computer and mobile device:

- **Sign in on your computer**: Go to Google. In the top right, select **Sign in**.
- **Sign in on your phone or tablet**: Open the Google Maps app . Then, tap your profile picture or initial > **Sign in to your account**.

Adding contacts

- To add a new contact to the phone book, follow these steps:
- Go to the Home screen. Press the Menu key.
- Select Contacts and press the Menu key.
- Press the Options key.
- Select Add new contacts and press the Select key.
- Select First name and enter a name.
- Select Phone and enter a phone number.

Gesture

A gesture is a form of non-verbal communication or non-vocal communication in which visible bodily actions communicate particular messages, either in place of, or in conjunction with, speech. Gestures include movement of the hands, face, or other parts of the body.

Download apps to your Android device

You can download no-charge and paid apps from Google Play on your Android phone. We recommend that you get apps from Google Play, but you can also get them from other sources.

Your phone has a security setting that checks for potentially harmful apps, warns you, and removes apps if necessary.

Download apps from Google Play

1. Open Google Play.
    - On your phone, use the Play Store app .
    - On your computer, go to play.google.com.
2. Find an app you want.
3. To check that the app is reliable, find out what other people say about it.
    - Under the app's title, check the star ratings and the number of downloads.
    - To read individual reviews, scroll to "Reviews" section.
4. When you pick an app, tap **Install** (for no-charge apps) or the app's price.

Download apps from other sources

Important: If you download apps from unknown sources, your phone and personal information can be at risk.

- Your phone could get damaged or lose data.
- Your personal information could be harmed or hacked.

Delete, disable & manage unused apps on Android

You can uninstall apps you've installed on your phone. If you remove an app you paid for, you can reinstall it later without buying it again. You can also disable system apps that came with your phone.

Delete apps that you installed

1. Open the Google Play Store app .
2. At the top right, tap the **Profile icon**.
3. Tap **Manage apps & devices** › **Manage**.
4. Tap the name of the app you want to delete.
5. Tap **Uninstall**.

Tip: If you delete or disable an app, you can add it back to your phone. If you bought an app, you can reinstall it without buying it again.

Disable apps that came with your phone

You can’t delete some system apps that came pre-installed on your Android phone. But on some phones, you can turn them off so that they won't show on the list of apps on your phone.

Unused apps

If you haven't used apps for a long time, Android optimizes it by:

- Freeing up space by deleting temporary files
- Revoking app permissions
- Stopping the apps from running in the background and sending any notifications

You can go to **Apps** › **Unused apps** to review apps that were unused and have been optimized.If you want to exclude any specific app from this feature, go to **App Info** › **Unused apps** › **Pause app activity if unused** toggle, then turn this off.

Use navigation in the Google Maps app

To get easy, turn-by-turn navigation to places, use the Google Maps app. Maps shows you directions and uses real-time traffic information to find the best route to your destination.

With voice navigation, you can hear traffic alerts, where to turn, which lane to use, and if there's a better route.

What you need to use navigation

On your phone or tablet:

- Turn on your GPS.
- Let Google Maps use your current location and audio speakers.

Android iPhone & iPad

Start or stop navigation

1. On your Android phone or tablet, open the Google Maps app .
2. Search for a place or tap it on the map.
3. At the bottom left, tap **Directions**. If you touch and hold the button instead, you'll start navigation and can skip steps 4 through 6. Learn how to add more destinations.
4. Choose your mode of transportation.
5. If other routes are available, they'll show in gray on the map. To follow an alternate route, tap the gray line.
6. To start navigation, tap Start . If you see "Searching for GPS," your phone is trying to get a GPS signal. For example, you might be in or near a tunnel, parking garage, or other location where there's no GPS signal.
7. To stop or cancel navigation, go to the bottom left and tap Close .

Tips:

- You can see traffic info, public transit options, and local places of interest in just a few seconds.
- To find the map from your point of view, tap the compass.

Find more actions while navigating

To find more actions while you're navigating to a place, go to the information card at the bottom of the screen and swipe up. To hide the menu, swipe down on the information card.

- Share trip progress : Share your live location until you arrive.

- Search along route : Find a place along your route, like a restaurant or gas station.
- Directions : Get a list of step-by-step directions.
- Show traffic on map (while Driving only): Find traffic delays along the way, such as crashes or construction work.

- Show satellite map : Review the map in more detail, using satellite images.
- Settings : Change your settings, like switching between miles and kilometers or avoiding toll roads.

Hear voice directions

When you navigate to a place, you can hear voice directions.

Change the volume level

1. On your Android phone or tablet, open the Google Maps app .
2. Tap your profile picture or initial > **Settings** > **Navigation settings** > **Voice level**.
3. Choose **Louder**, **Normal**, or **Softer**.

Mute, unmute, or hear alerts

1. On your Android phone or tablet, open the Google Maps app .
2. Start navigation.
3. At the top right, tap Sound . Then, choose one of the following:
   - **Mute**: Tap Mute .
   - **Hear alerts**: Tap Alerts . You'll hear alerts like traffic, construction, and crashes. You won't hear turn-by-turn directions.
   - **Unmute**: Tap Sound .

Mute voice directions during phone calls

If you get a phone call while navigating somewhere, you can answer the call, but you'll hear voice directions unless you mute it.

1. On your Android phone or tablet, open the Google Maps app .
2. Tap your profile picture or initial › Settings › **Navigation settings**.
3. Turn on or off "Play voice during phone calls."

Change the voice

You might be able to switch to another voice from your phone or tablet's text-to-speech settings.

1. Go to your phone or tablet's settings app.
2. Tap **Language and input**.
3. Tap **Text-to-speech output**.
4. Under "Preferred engine," select another text-to-speech option.
5. Voice navigation uses the voice you select. This changes the voice in other apps too.

Change the language

1. On your Android phone or tablet, open the Google Maps app .
2. Tap your Profile picture or initial › **Settings** › **Navigation settings**.
3. Under "Sound & voice," tap **Voice selection**.
4. Select a language.

Backup & reset settings

The **Backup & reset** settings menu provides settings related to backing up the data on your device. This allows certain settings such as Wi-Fi passwords, and certain application data to be restored after resetting the device.

Some devices will have additional options here, such as options specific to your device manufacturer.

Back up my data

This setting controls whether the backup service should run on this device.

Google's backup and restore functionality should be considered a convenience only. You should not use it as your sole backup, and you should always back up videos and photos you have taken.

Backup account

This setting allows you to choose which Google account your backups should be associated with.

Not all backed-up data can be restored to any device: when switching to a new phone, most app settings will not be transferred, whereas other settings such as Wi-Fi settings can usually be carried across.

Automatic restore

Enable the backup service to restore settings when reinstalling apps that you have previous backups for.

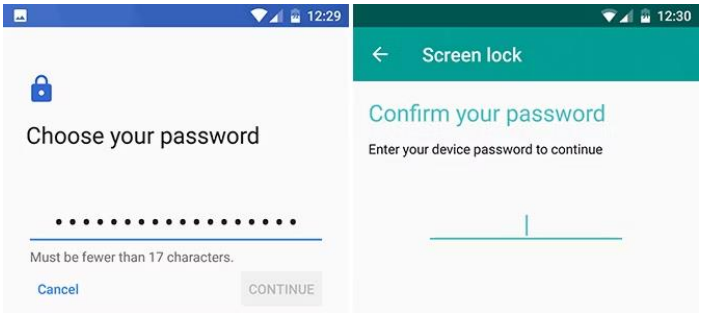
Security over smartphone

- **Password**

Password, in our opinion, is the most secure way to lock your Android phone. Just like setting up a password for your email or social media apps, you can set a secure password containing different characters on your Android phone. In our case, a strong password is a mixture of several characters containing capital letters, small letters, symbols, and numbers.

Though you don't want to keep typing long passwords to unlock your Android all-day, it's advisable to set a password that's hard to crack, even by a person sitting next to you. Here's how to set a password on your Android phone.

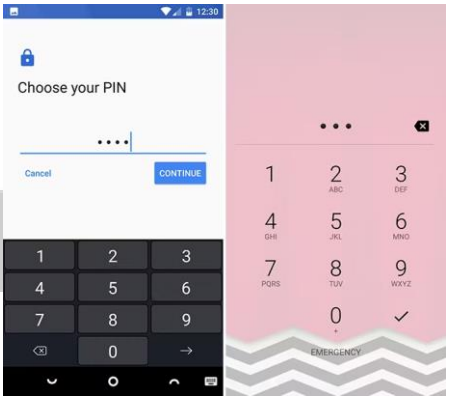
1. Launch the **Settings** app on your phone and open
2. Click on **Screen Lock,** followed by **Password**
3. Input your desired **4-17 characters**, then hit the **Next**
4. **Re-enter** the selected password to confirm it.



- **Pros:** A strong password is very secure.
- **Cons:** Not convenient to type many times each day.
- **When to use it:** When you need the highest level of security.

- **Pin:**Unlocking your phone with a PIN is super-simple and fast if it's your primary protection method. All you need is to use strong digits — that doesn't look alike — to ensure no one can jailbreak into your device behind you. Follow the steps below to set up a PIN for your Android screen lock.

1. Go to the Security settings on your phone.
2. Click on **Screen Lock,** then tap **PIN**
3. Input your preferred **4-17** digits, then hit
4. Re-enter the PIN to confirm it.



- **Pros:** Easier to enter than a password.
- **Cons:** A strong PIN code can be difficult to remember.
- **When to use it:** As a backup to a biometric security option.

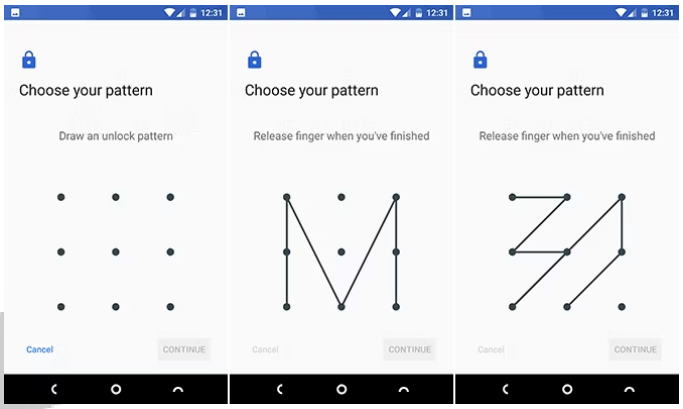
A PIN code is a simple alternative to a password. Android allows PINs of up to 16 digits, which equates to 10 quadrillion combinations. While a 16-digit PIN is extremely secure, it's tough to remember.

Pattern Lock

- **Pattern**

With the pattern screen lock option, you can unlock your phone by drawing a preferred pattern on the screen. The pattern contains 9 dots (3x3), which you must connect at least 4 of them to make a unique one. Follow the steps below to set up a pattern for your screen lock on Android phone.

1. Go to the Security settings on your phone.
2. Click on **Screen Lock,** then tap **Pattern**
3. Draw your preferred pattern, then click **next**.
4. Re-draw the pattern to confirm it.



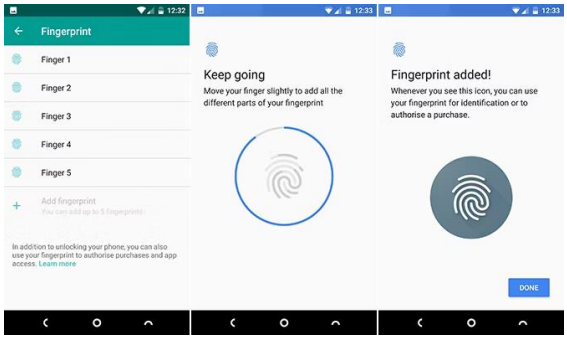
- **Pros:** Simple and intuitive to use.
- **Cons:** Many people choose simple, predictable patterns.
- **When to use it:** If you don't have a fingerprint scanner and dislike PINs.

Fingerprint scanning:

- **Fingerprint scanner**

Fingerprint authentication, on most Android phones, is reliable, fast, and secure. If your phone has a physical fingerprint sensor, you need not worry about turning on the screen before unlocking your phone - just place your hand on the sensor to unlock it.

Here's how to calibrate fingerprint on your phone.



1. Open the **Security** settings on your phone.
2. Click on If you haven't set up a screen lock method already, you'll need to do that first.
3. After that, click on **Fingerprint Management,** then confirm your screen lock.
4. Click on **Create fingerprint.** Place your preferred finger on the fingerprint sensor and follow the on-screen instructions to complete the calibration. The process is simple. Just keep placing, withdrawing, and rotating the finger to ensure it captures the full biometric.

- **Pros:** Fast and quite secure.
- **Cons:** Sensors aren't always positioned in the right spot.
- **When to use it:** The default for most users.

Fingerprint sensors are now so common you even get them in many entry-level phones. It has become the preferred unlock method for many.

Facial Recognition

Face Unlock/Recognition is the second biometric factor on Android, and the last security option we're going to mention in this article. Straight from its name, Face Unlock lets you unlock your phone with your face. On some advanced, flagship Android phones, you get a more secured 3D Face Unlock or Iris Face Unlock method. But most mid-range and budget Android devices use just the front-facing camera, which is not very secure.

1. Open the **Security** settings on your phone.
2. Click on **Face Unlock** and confirm your screen lock. If you already haven't set-up a screen lock method, you'd be asked to do so first.
3. On the **Face Unlock** interface, click on Find a place with good lighting condition and point the selfie camera to your face. Let it finish processing, and you're good to go after that.

- **Pros:** Fast and unlocks your phone with just a glance.

- **Cons:** Not very secure in its current form.
- **When to use it:** Only if you don't need access to banking or payment apps.

For additional security, you can even hide installed apps on your Android device.

1. Download **AppLock** from Google Play on your Android device. The app is free to download and use, though to get rid of ads and unlock advanced functionality, you'll have to purchase the full version.
2. The first time you launch the app, you'll be prompted to create a Master PIN. Enter a four-digit PIN, but make sure to keep it different from your phone's unlock PIN. You will have to enter the PIN twice for confirmation purposes.
3. If you have the fingerprint scanner set up on your device, AppLock will ask you whether you want to lock apps using a fingerprint. Tap on **Yes** or **No**, depending on your preference.
4. Tap the + symbol and then proceed to select the apps that you'd like to lock. You can lock as many apps as you want. Confirm your selection by tapping the + symbol again.

Election Security Spotlight – Secure Web Browsing

Secure web browsing involves the use of tools and techniques to protect users from cyberattacks, malware, or other cybersecurity vulnerabilities. Web browsers allow users to view sites on the internet by displaying images and text, executing code, rendering animations, and saving information. Malicious actors can leverage these functions to gain access to a user’s system. Major web browsers, such as Microsoft Edge, Mozilla Firefox, Apple Safari, and Google Chrome, are not always set up in a secure default configuration. Some common features of web browsers are:

- Extensions are software programs that allow you to customize the browsing experience. These programs, built using website code, typically serve a single purpose, and vary widely. They include things like ad blockers and embedded video conferencing functionality.
- Cookies are files placed on a system to store data for specific websites, often used to uniquely identify the computer visiting the website. Some viruses and

malware disguise themselves as cookies or exploit cookie tracking capabilities.

- Browser Cache is a temporary storage area in a computer's memory or disk that saves information from a web page, allowing you to quickly re-visit a website without having to download the information again.
- Private Browsing is a feature offered by web browsers that does not retain temporary browsing data, such as cookies. Some versions of private browsing offer tracking protection and disguise a user's location. However, private browsing does not completely protect a user's privacy, nor does it offer complete data security.
- Password managers, which are incorporated into most modern browsers, save your login information for multiple websites. Password managers built into browsers, as opposed to third party options, are not recommended as a security best practice as they are not all programmed to store password information securely.

Keyboard Introduction:-

- Windows= PC keyboards have a windows key, which looks like a four-pane window.
- Esc= Escape Key
- F1-F12= Information about the F1 through F12 Keyboard Keys.
- Tab= Tab Keys, Tabular Key(0.5 inch)
- Caps Lock= Caps lock key, Capitalize
- Shift= Shift Key
- Ctrl= Control Key
- Fn= Function Keys
- Alt= Alternate Keys
- Spacebar= Spacebar Key(0.1 inch)
- Arrows= Up, Down, Left, Right Arrow Keys
- Backspace= Backspace Key
- Delete= Delete or Del Key
- Enter= Enter Key
- Prt Scrn= Print Screen Key
- Break= Break Key
- Insert= Insert Key
- Home= Home Key
- Page Up= Page up or Pgup Key
- Page Down= Page down or Pgdn Key
- End= End Key
- Num Lock= Number Lock Key
-
- ~ = Tilde
- ` = Acute, Back quote, Grave, Grave accent, Left quote, Open quote or push
- ! = Exclamation mark, Exclamation point or Bang
- @ = Ampersat, Arobase, Asperand, At or At Symbol
- # = Octothrope, Number, Pound, Sharp or Hash
- %= Percentage
- ^ = Caret or Circumflex

- & = Ampersand, Epershand or And
- *= Asterisk, Star
- (= Open Parenthesis
-) = Close Parenthesis
- _ = Underscore
- - = Hyphen, Minus, Dash
- + = Plus
- = = Equals
- { = Open Brace, Squiggly brackets, curly brackets
- } = Close Brace, Squiggly brackets, curly brackets
- [= Open bracket
-]= Close bracket
- | = Pipe, Or, Vertical Bar
- \ = Backslash or Reverse Solidus
- / = Forward slash, solidus, Virgule or whack, slash
- : = Colon
- ; = Semicolon
- " = Quote, Quotation mark, Inverted Commas
- ' = Apostrophe or single quote
- < = Less than or angle bracket
- > = Greater than or angle bracket
- ,= Comma
- . = Period, dot or full stop
- ? = Question mark

Uses Of Function Keys:-

F1

Used as the help key in almost every program, it opens a help screen when this key is pressed.

Windows Key + F1 opens the Microsoft Windows help

F2

in Microsoft windows, renames a highlighted icon, folder or file, in all versions of Windows.

In Microsoft Excel, it edits the active cell.

Ctrl+F2 displays a print preview window in the Microsoft Word.

Quickly rename a selected folder or file.

F3

opens a search feature for many programs, including the Microsoft Windows..

Shift+F3 will change the text in Microsoft Word from upper to lowercase or a capital letter at the beginning of every word.

F4

Open the address bar in the Internet Explorer and the Windows Explorer.

Alt+F4 closes program window currently active in the Microsoft Windows.

Ctrl+F4 closes the tab in the active window or open window in Microsoft Windows.

F5

In all modern Internet browsers, pressing F5 will reload or refresh the document window or page.

Ctrl+F5 forces a complete refresh of a web page. It clears the cache and downloads all contents of the page again.

Refresh the list of contents in a folder or a file.

Open the find, replace, and go to the window in the Microsoft Word.

Starts a slideshow in PowerPoint.

F6

Move the cursor to the address bar in Mozilla Firefox, Internet Explorer and most other Internet browsers.

F7

commonly used to spell check and grammar check a document in Microsoft programs such as Microsoft Word etc.

Shift+F7 runs a Thesaurus check on word highlighted.

Turns on the Caret Browsing in browser (Browsing a webpage with the help of a keyboard.)

F8

Enter Word's selection mode and expand a selection.

F9

Refresh document in the Microsoft Word.

F10

In Microsoft Windows, it activates the menu bar of an open application.

Shift+F10 is the same as the right-clicking on the highlighted icon, Internet link or file.

F11

Exit and enter full screen mode in all modern Internet browsers.

F12

Open the Save as a window in the Microsoft Word.

Ctrl+F12 opens a document in the Word.

Shift+F12 saves the Microsoft Word document (like Ctrl+S).

Ctrl+Shift+F12 prints a document in the Microsoft Word.

Introduction to Communication Skill

Passing of Information from one person to other is called communication. It is a two-way process.

Importance: -

- Import and Export of thoughts.
- To provide Information for decision making.
- To clarify responsibility for result.

Principal of Effective Communications

Self-Satisfaction: -
Sender of the Information must be absolutely clear of his objective of message.

Clarity: -
Language of communication should be simple, clear and commonly understood.

Attention: -
Communication must aim at making the message understood by the recipients.

Adequacy: -
Message should be adequate and complete for proper comprehension by the receiver.

Integration: -
Communication must aim at strengthening the organization to achieve its goal.

Feedback: -

In order to ensure that the message is understood by the receiver correctly, it is desirable to have feedback from the receiver.

Types of Communications

According to Direction: -

Downward Level: -
When an upper level person communicates with lower level person, it is called downward level. Such as a manager communicates with a clerk.

Upward Level: -
Opposite to Downward Level, in this type of communication a lower level person communicates with upper level person.

Horizontal Level: -
When both persons are of same levels in communication, it is called Horizontal Level. Such as two teachers discuss on a topic.

According to Organizational Structure: -

Formal: -
Communication created for some objective is called formal/official communication.

Informal: -
A time pass activity like jokes sharing. It is an in vain process that provide no commercial benefit.

According to Expressions: -

Written: -
Communicate through some hard medium like Rules, Regulations, Instructions, Magazines etc.

Oral: -
Communicate through voice only like Personally, Face-to-face,Lecture,

Body Language: -
Body Language is a type of non-verbal communication in which physical behavior is used to express or convey information. Such behavior includes facial expressions,

body poster, eye movements, etc. It is not a fine language. Body Language exists in both humans and animals.

Listening Skills

Listening is to give attention to one's sound. It is the ability to accurately receive the message conveyed by someone.

Importance of Effective Listening: -

- Expand capacity and knowledge.
- Great Listening Skills make an employee more competent and capable.
- Reduces the risks of misunderstanding and mistakes that could be very damaging to the business.
- Helps to solve the problem quickly and saves the time and money.

Difference between Hearing and Listening: -

Hearing is simply the act of receiving sound by the ear. Listening, however, is something you consciously choose to do. It requires concentration.

Measures to improve Listening: -

- Face the speaker and make eye contact.
- Be attentive but relaxed.
- Keep an open mind.
- Listen to the words and try to picture what the speaker is saying.
- Give a feedback to the speaker.

Reading Skills

Reading is a mean of communication and of sharing information and ideas.

Importance of Reading: -

- Increase our knowledge.
- Explore yourself to new things.
- Self-Improvement.
- Tools of communicating.
- Connects you with the world.
- Boost Imaginations and Creativity.

Types/Techniques of Reading: -

Scanning: -
Scanning involves looking only for specific information.

Skimming: -
Skimming involves reading more in less time.

Intensive Reading: -
It is the most time consuming process of all the Reading Techniques. The main goal here is to retain information for the long term.

Extensive Reading: -
Extensive Reading focuses on reading for pleasure.

Employment Skills

Contents of good Resume: -

- Experience
- Academic Qualification
- Professional Qualification
- Courses/Training attended
- Extra-Curricular Activities
- Remuneration
- Personal Information

Guidelines for writing Resume: -

- Resume should be written on a clean and neat paper.
- If typed, then A4 paper should be used.
- Fonts should be Times New Roman of 12” size.
- Size of Headings should be 14”.
- Qualifications, Experiences must be described in descending order.
- Each point must introduce you perfectly.

Interview Skills: -

- Must collect all documents.
- Dress up well.
- You must remember name and the date of the publication of vacancy.

- Also remember the date of submission of CV.
- How will you reach the destination place?
- Have a diary, pen/pencil with you.
- You must confirm about company and job.
- Ready to introduce yourself in advance.

Face to Face Interview : Face-to-face (F2F) interviewing is one of the oldest and most widely used methods of conducting primary research. F2F interviews are conducted by a market researcher and a target respondent in the street, home, office, meeting place, etc. There are many advantages to using F2F interviews, such as the use of visual aids and the detection of social cues and body language

F2F interviews are very effective, this type of interview can be costly and time consuming. F2F interviews require a significant amount of time on the front end to identify, recruit, and schedule the interview as well as the travel time and costs to meet the respondent in person.

Advantages of F2F Interviews

- Allow for more in-depth data collection and comprehensive understanding.
- The interviewer can probe for explanations of responses
- Stimulus material and visual aids can be used to support the interview
- Interview length can be considerably longer since the participant has a greater commitment to participate

Disadvantages of F2F interviews

- Interviews are more time consuming to recruit and conduct
- As a result of timing and travel, F2F interviews can be expensive
- Interviews can deliver biased responses

Most carefully vet the respondent's ability before investing time in the recruitment process and interview process.

Entrepreneurship

Meaning:

Entrepreneurship is the ability of an individual to convert the idea and thoughts into reality. Entrepreneurship is a process or course of action undertaken by an entrepreneur to successfully run an enterprise. It may be defined as the ability to take calculated risks, innovative ideas, vision to grab the opportunity.

Definition:

According to Robert K. Lamb, "Entrepreneurship is that form of social decision which is performed by economic innovators."

Characteristics:

Entrepreneurship is a multi-dimensional and complex subject. Some of the most important features of Entrepreneurship are as under:

1. **Economic activity**: Entrepreneurship is primarily an economic function because it involve the creation and operation of an enterprise. It is basically concerned with the production and distribution of goods and services.
2. **Innovation**: An entrepreneur is basically an innovator who process something new for the economy. Innovation means the introduction of a production process, which has not been applied so far in any particular manufacture branch.
3. **Decision making**: It is the most important features of Entrepreneurship. Entrepreneur has to take decisions under uncertainty. He has to pay attention to rational aspect of decision making. HE decides about the type of business to be done and way of doing it.
4. **Managerial skill:** This is most important feature of Entrepreneurship. Entrepreneur must have more than derive to earn profits and a mass wealth. They must have the ability to lead and manage. He should be able to identify, select and develop executive who can effectively manage and control the human resources.
5. **Risk bearing**: Risk is an inherent element of entrepreneurship. An entrepreneur assumes the uncertainty of future. Entrepreneurship deals with the challenges which are to be faced by entrepreneur in his behavior. It is always risky to start a new enterprise an doing something new and differently. Entrepreneur needs to a risk taker not risk avoider.
6. **Gap filling function**: The gap between the human need and the available products and services gives rise to entrepreneurship. An entrepreneur

identifies the gap and takes necessary steps to fill the gap. He introduces new products and services, new methods of production , new markets for this purpose. Thus, Entrepreneurship is a function of input completing and gap filling.

7. **Dynamic process**: Entrepreneurship is a dynamic process. Entrepreneurs thrive on change in the environment which brings useful opportunity for the business. Flexibility are the hallmark for the success of a business.

Difference between entrepreneur and businessmen

A **businessman** walks on the defined path, but an **entrepreneur** believes in making his own path, which becomes a guideline for other businessmen.

Difference between entrepreneur and businessman

BASIS FOR COMPARISON	BUSINESSMAN	ENTREPRENEUR
Meaning	A businessman is someone who sets up a business with an existing idea offering products and services to the customers.	An entrepreneur is a person who starts an enterprise with a new idea or concept, undertaking commercial activities.
Market Position	Market Player	Market Leader
Nature	Calculative	Intuitive
Market	Creates place in existing markets	Creates new market
Risk factor	Less	Comparatively high

BASIS FOR COMPARISON	BUSINESSMAN	ENTREPRENEUR
Methods applied for doing things	Conventional	Unconventional
Approach	Holistic	Atomistic
Orientation	Profit	People
Competition	Very high	Low

Difference between entrepreneurship and traditional business:

Traditional	Entrepreneurial
1. Hierarchic	1. Team/work oriented
2. Centralized control	2. Decentralization/empowerment
3. Focus on what is best for the organization	3. Focus on improvement of the client
4. Emphasis on programs	4. Emphasis on core competencies
5. Depends on outside resources	5. Financially self-sufficient
6. Attempts to be all things to all people	6. Niche orientation

QUALITIES OF AN ENTREPRENEUR

To be an Entrepreneur, you must possess most of these qualities;

1. Be open-minded

2. Problem identifier and solver
3. Passionate
4. Confident and disciplined
5. Risk-taker
6. A constant flow of ideas
7. Creative
8. Competitive
9. Opportunist
10. Determination (Strong-willed)

"An entrepreneur is an individual who sets up business or businesses, identifies and solves problems, creative, innovative, opportunist, risk-taker, self-starter, and open-minded with the hope of making a profit from the enterprise". – Francis Nwokike (Founder, The Total Entrepreneurs)

FUNCTIONS OF AN ENTREPRENEUR

1. **Risk Taker**: An Entrepreneur bears any risk in starting up and sustaining his/her business(es). S/he assumes every responsibility that might come up in the course of his business which might be caused by either change in time or quality. He is always ready for emergencies and should competitors emerge, thinks of strategies to outshine them. Mike Gafka said, "To be successful you must accept all challenges that come your way. You can't accept the ones you like."

2. **Sales Person**: An Entrepreneur must be a good salesman. If one cannot sell as an entrepreneur, one cannot succeed. S/he is responsible for marketing and advertising his products or services. I assert that there is no magic about making money; it is essentially a medium of exchange of goods and services. So if you are not providing goods and services, you are not qualified to enjoy financial fortune.

3. **Goal Getter**: Entrepreneurs do not only set goals but also thrive so much to achieve their goals. **Robert Kiyosaki** says, Most people know how to set goals, few people know how to achieve them, that is how to identify an entrepreneur. **Entrepreneurs set big goals**, so exhilarating that it is scary to an ordinary man.

4. **A Leader**: One challenge of being an entrepreneur is that you have to be in charge. You must be at the forefront of your business at least during startup. You

should note that one cannot make it alone as an entrepreneur. Outstanding leaders go out of their way to boost the self-esteem of their personnel. If people believe in themselves, it's amazing what they can accomplish – Sam Walton. To be a successful entrepreneur, you must possess the ability to attract smart people and build a great business team.

5. **Decision Maker**: Entrepreneurs determine the objectives of their business and they should know what is suitable per time. He decides and maintains the potential investors or financiers of the enterprise and also manages the funds available. He makes sure that his business venture is in good relationship with pubic authorities and society. He also decides the market for his product or services.

6. **Identifies and Solves Problem**: An entrepreneur is quick to identify any problem facing his/her business and immediately seeks a solution. It is said that he that wears the shoes knows where it pains. S/he knows that if any challenge is not resolved as soon as they come, they are bound to face setbacks in the near future.

Entrepreneurship as a career option:-

Entrepreneurs are independent-minded, innovative people, who are on a quest to create unique products and services. Entrepreneurship might be difficult, but it is a rewarding journey.

Only a generation ago, Indians solely focused on well-defined, tried and tested career paths. Young adults usually followed in the footsteps of their parents and opted for a secure career. Today, entrepreneurship has become one of the significant career choices being pursued by the youth because of the following reasons:

• The ambition to create and execute a business plan from scratch
• The desire to be their own boss and master of their fate
• The motivation to take risks in a changing global economy where several opportunities lie unexplored
• The aim to be financially prosperous and take their growth trajectory to unprecedented, new heights