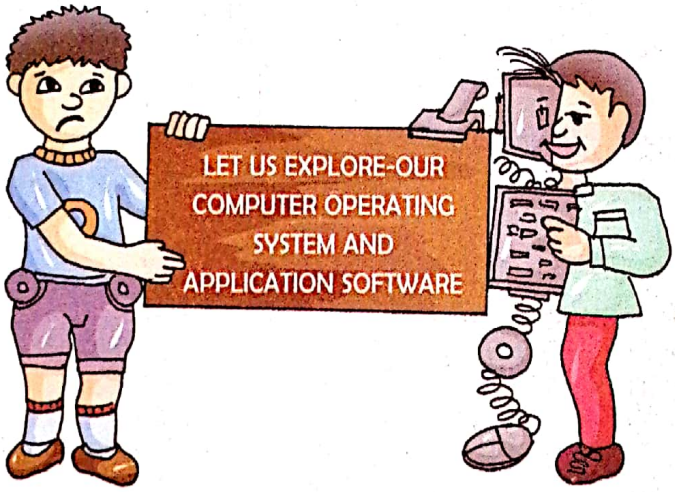
1 Let Us Explore-Our Computer Operating System, Application Software

Learning Objectives :

After the completion of this chapter learners will be able to:

- ❑ **understand the concept of hardware and software,**
- ❑ **differentiate between different types of software - Application and System Software,**
- ❑ **appreciate the role of Operating System to manage the computer resources,**
- ❑ **learn the concept of Proprietary, License, Freeware and Open Source Software.**



Tobo: Hi Dobo!

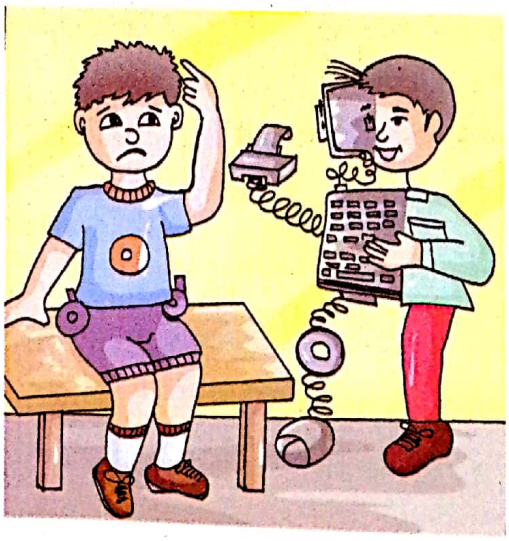
Dobo: Hey! Tobo, you are so tech savvy but I know so little about computer.

Tobo: You look thoughtful. What are you thinking about?

Dobo: I was just wondering what our teacher said.

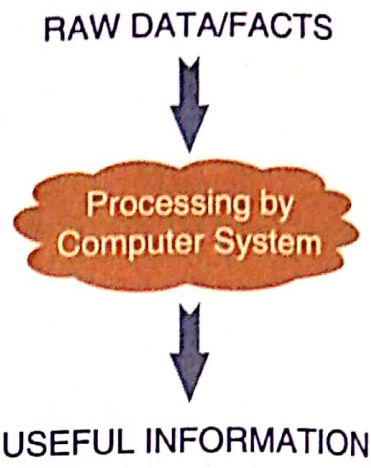
Tobo: What did she say?

Dobo: Well, she said that **a computer is an electronic device that takes an input, processes it and gives an output.**



She also said that computer takes input in the form of **raw data** and converts it into **information**. But, I am really confused.

Tobo: Whatever is the confusion, I think I can explain you in detail.



INTRODUCTION:

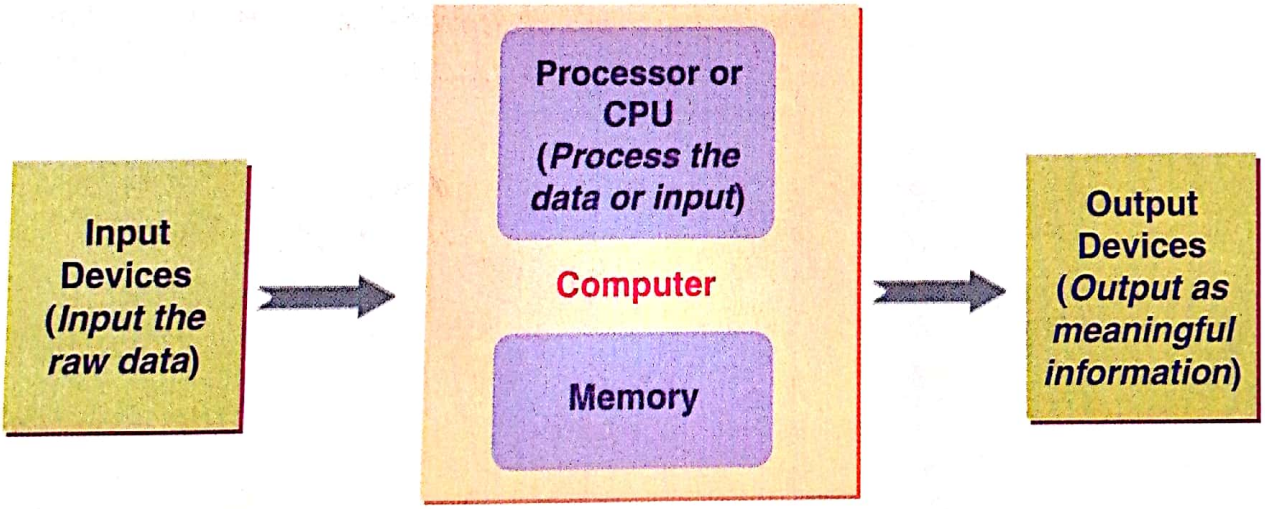
A **computer** is an **electronic device** that–

- **takes the input as raw data (facts),**
- **processes it into information (meaningful facts), and**
- **gives an output.**

It has the ability to **store**, **retrieve** and **process** data.

Dobo: Oh! sounds simple. Can you further explain the components of Computer System? Do you know them?

Tobo: Yes sure.

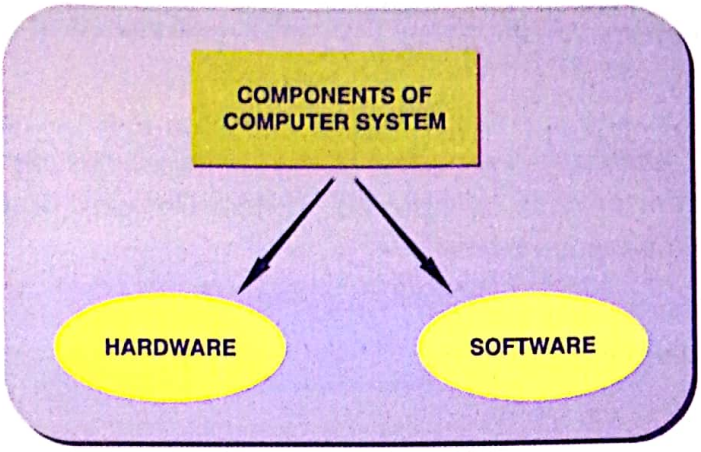


COMPUTER SYSTEM

COMPONENTS OF COMPUTER SYSTEM

A Computer System is made up of **two components**:

1. **Hardware**
2. **Software**



HARDWARE: ***The physical components of computer system which we can touch and feel are called Hardware.***

Or

The collection of physical parts of a computer system is called Hardware.

Analogy: Hardware is all the parts that make up human body like bones, muscles, skin, blood etc.

Analogy: Hardware is all the pages in the text book.

SOFTWARE: ***Software is a set of programs which governs smooth operation of the computer system.*** A software consists of instructions that tells the hardware how to perform a task.

Analogy: Software is all the thoughts and mental processes that tell our body parts what to do.

Analogy: Software is all the letters, words, sentences in the text book.

DO YOU KNOW

Instructions: These are the commands given to the computer in a language it can understand.

DO YOU KNOW

Program: A set of instructions that tells the computer what to do.

Both hardware and software are essential parts of a computer system. In absence of hardware, software is unusable and without software, hardware is unusable. **Hardware and Software together form a usable computing system.**

REMEMBER:
Both Hardware and Software are interdependent.

Hands On

Go to the computer lab and find out some of the Hardware devices being used and try to classify these hardware devices as Input and Output Devices. Write your observation under the correct column provided below.

Name of Hardware devices in the Computer Lab	Type of Device (Input or Output Device)

ACTIVITY :

Survey the school and find out **different types of software(s)** being used in **computer lab, library, accounts department, fee counter** etc. Write the names of the software (s) being used by various departments in the space provided.

Dobo: Tobo! You have bones and you also look like a machine so who are you? A human or a machine?

Tobo: Umm... I am similar to a computer hardware as I can take the input, process it, give the result and also store the information. Do you know that computer hardware can be further classified?

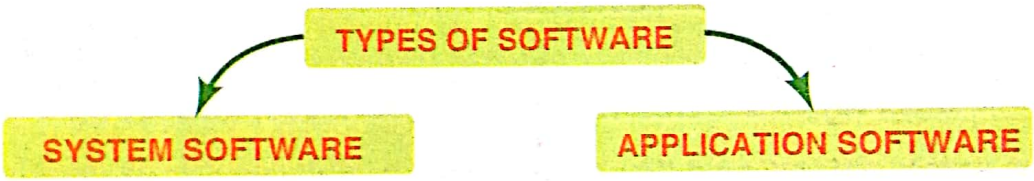
Dobo: Oh really!

TYPES OF HARDWARE:

Computer Hardware is broadly classified into following types:

1. **Input** Device
2. **Processing** Device
3. **Storage** Device
4. **Output** Device
5. **Communication** Devices

TYPES OF SOFTWARE:



Dobo and his father went to the market to purchase a bicycle. For this, they first went to an ATM to withdraw cash for purchasing the bicycle for Dobo.

While Dobo's father was withdrawing money from ATM machine, Dobo was watching with curiosity.

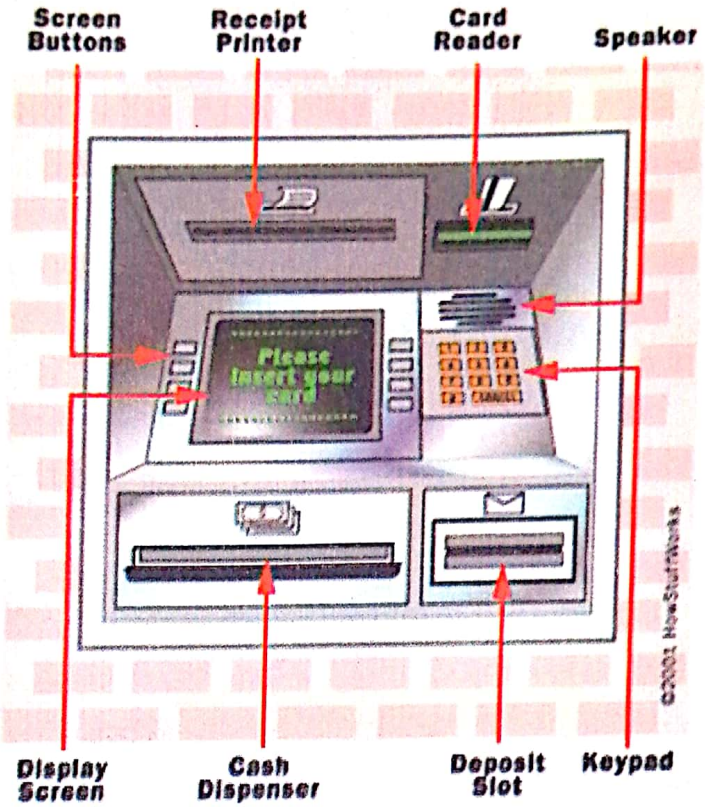
Dobo: How does it work father?

Father: It has a special type of software called ***System Software***.

System software controls all the hardware of this machine.

For example: It has a **Card reader machine, Cash dispensing machine, Receipts Printer, Touch screen monitor.** All these hardware devices are controlled by the **System Software of the ATM Machine.**

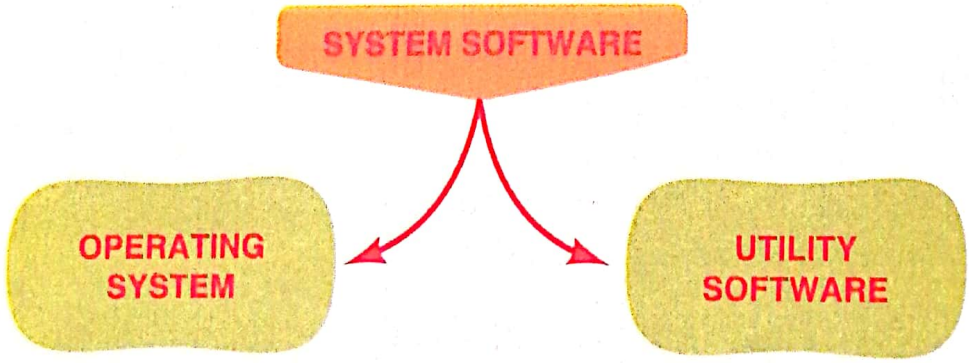
Also, there is an ***Application Software*** which interacts with us and performs various operations for us. For Example: Cash withdrawal, Balance enquiry, Mini Account Statement etc.



(I) SYSTEM SOFTWARE

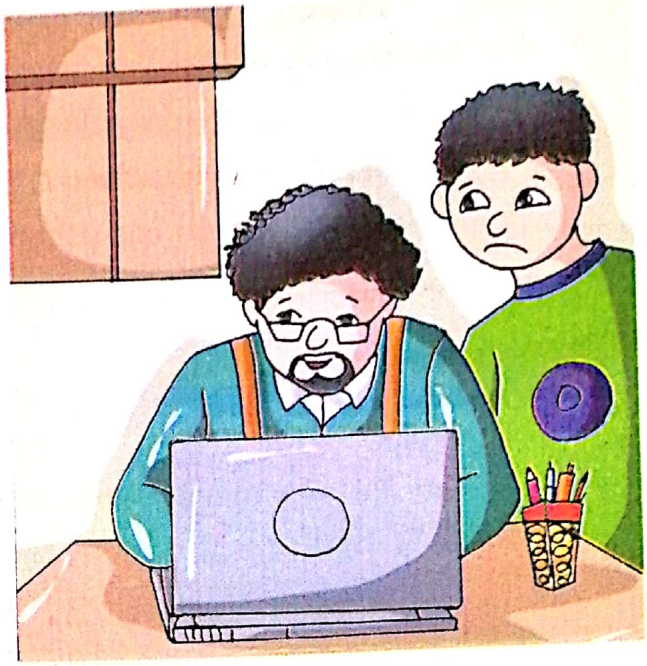
Software that manages and controls computer hardware is called system software. It allows different parts of computer to work together to perform a specific task.

TYPES OF SYSTEM SOFTWARE



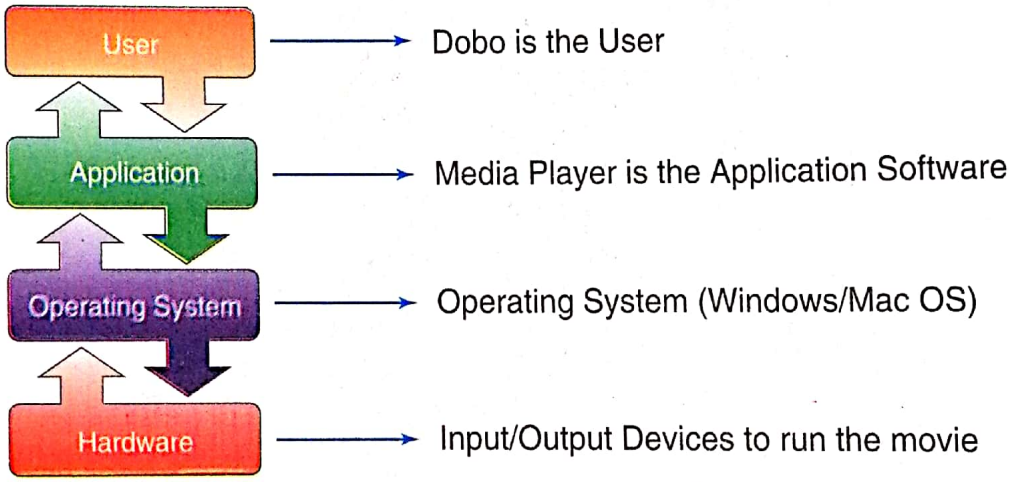
(A) OPERATING SYSTEM:

Dobo wants to watch a movie on his computer with his father. He turns on the computer system. His father, who is a **Software Engineer,** explains that presently they are the **users** as they are using the computer.



Dobo's father further explains that after the **loading of Operating System** gets over they will double click on Media Player (i.e. Application Software).

He further adds that an **Operating System enables us to run necessary hardware to execute the movie.**



DO YOU KNOW

Software Engineer: A person who is responsible for developing the software for our computers according to our needs.

Computers cannot work on their own. **They require instructions to work and manage the system. This work is done by the Operating System.**

DO YOU KNOW

Hard Disk is a magnetic disk on which we can store computer data.

Operating System:

- It is a **system software.**
- **It acts as an interface between the user and the hardware.**
- It ensures that computer system is **convenient to use.**
- And all **hardware resources** (Input and Output Devices) are used efficiently.

ACTIVITY :

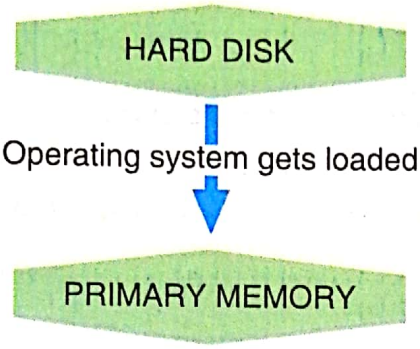
a) Make a list of various Mobile Phones available in the market along with their Operating System.

MOBILE PHONES	OPERATING SYSTEM

b) Find out which Operating System is installed on your parents' Laptop and Mobile Phone. Check both the devices in their presence.

OPERATING SYSTEM IN LAPTOP	OPERATING SYSTEM IN MOBILE PHONE

Dobo's father further explains that **when we switch on the computer system, the Operating System is loaded from the HARD DISK (Secondary Memory) to the PRIMARY MEMORY (RAM).**



DO YOU KNOW

Booting is the process that starts the Operating System when we turn on our computer.

The Operating System remains in the **Primary Memory (RAM)** and runs our various applications till we turn (switch) off our computer system.

INTERFACE: A device or software that allows the user to communicate with the computer.
Example: The touch screen interface of the mobile allows us to interact with mobile apps.

Watch the video on 'What is an OS?' to understand Operating Systems and answer the following questionnaire:

Link: https://www.youtube.com/watch?v=pTdSs8kQqSA

1. Which program lets you to interact with the computer?

   _____

2. Write the name of the OS discussed in the video.

   _____

3. Can all applications work on all Operating Systems? Yes/No_____

RESEARCH ACTIVITY :

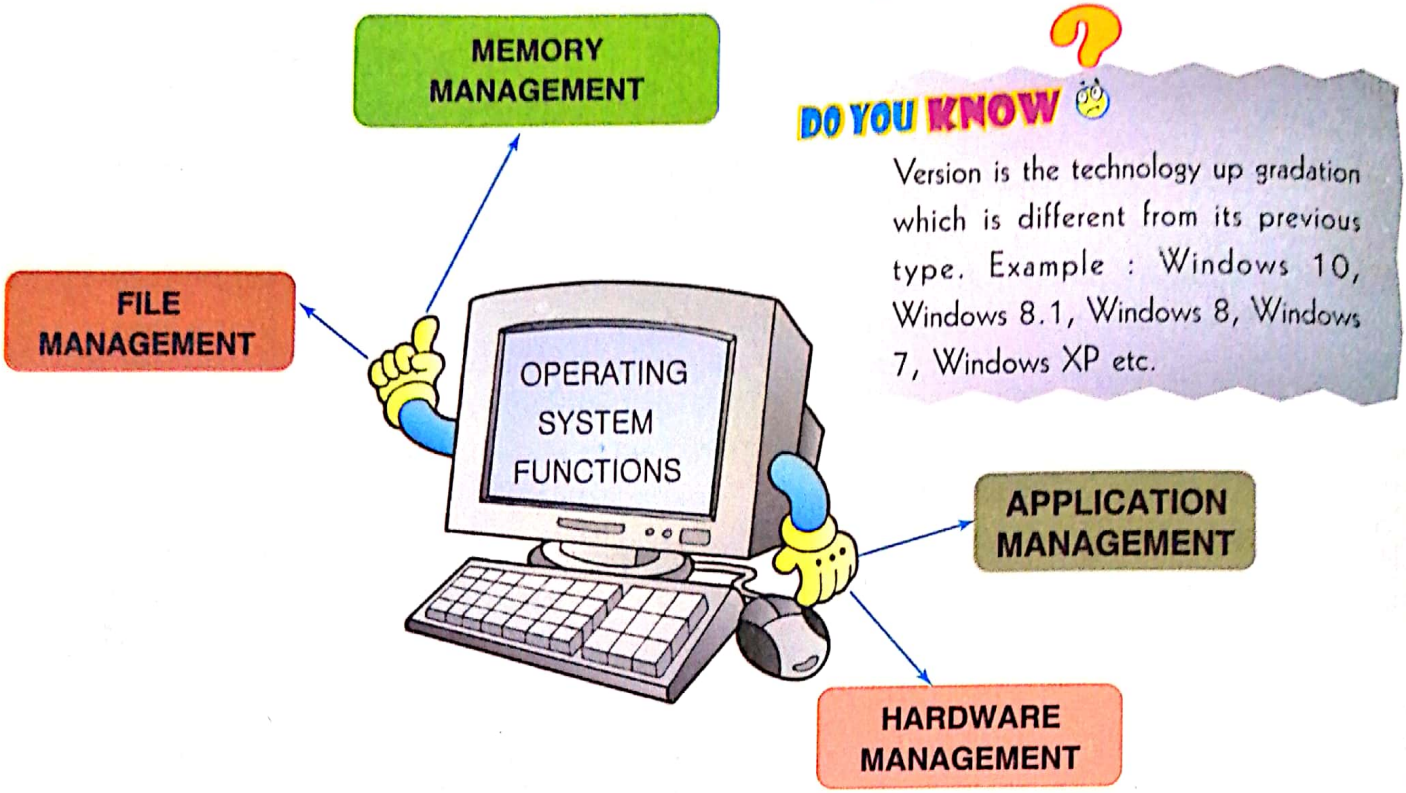
(a) Divide the class in groups. Each group is to collect information (latest version, developer i.e. company, year of launch and 2 unique features) on Windows, Android and Mac OS and present the information collected to other groups.

(b) Find out on which Operating System ATM Machines work.

_____

FUNCTIONS OF OPERATING SYSTEM:

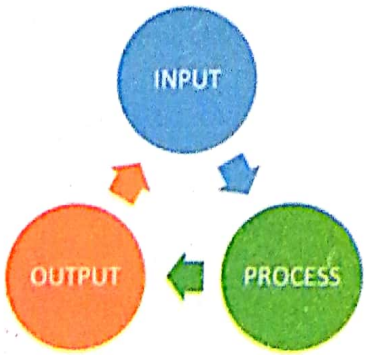
Let us discuss some of the **main functions** of Operating System:



DO YOU KNOW

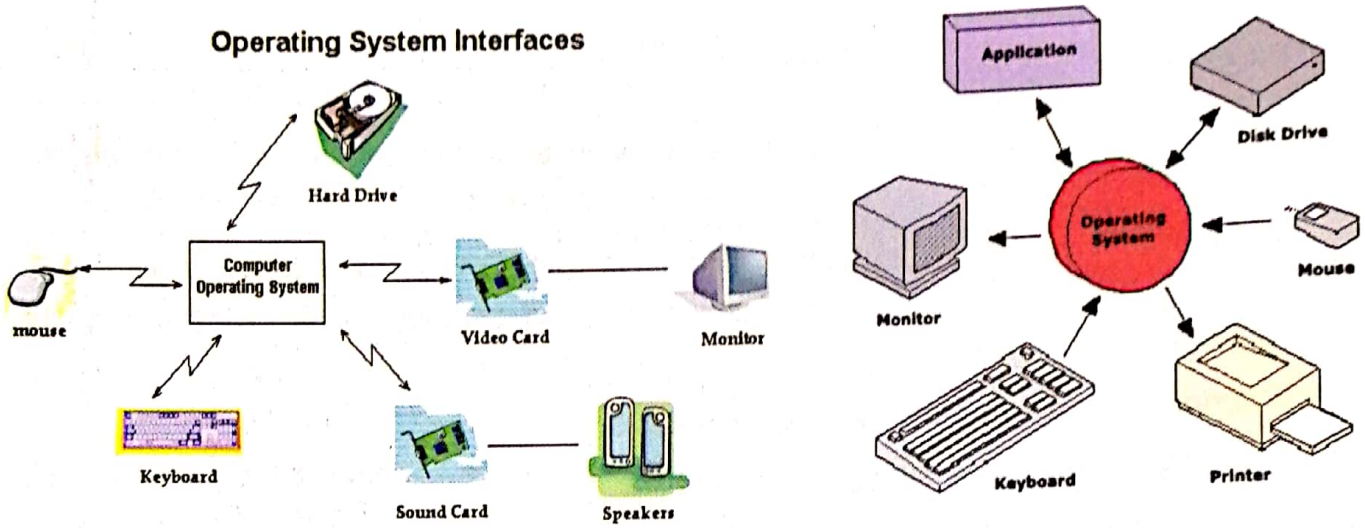
Version is the technology up gradation which is different from its previous type. Example : Windows 10, Windows 8.1, Windows 8, Windows 7, Windows XP etc.

1. **Memory Management**:- It manages different types of memories of computer. Example: Primary memory e.g (RAM/ROM), Secondary Memory e.g (Hard Disk)
2. **File Management**:-It manages all types of data present in files and folders. Example: It allows creation, modification, storage and management of files on computer system.
3. **Application Management**:- It allows you to run and manage applications, software on your computer system.
4. **Hardware Management**:-It coordinates and controls the input and output devices attached to the system. When the system takes the input, it is processed and the result is shown to the user through an Output device.



DO YOU KNOW

GUI is a Graphical User Interface. It allows the user to interact with electronic devices through graphical icons, menus etc.



Hands On

Boot the machine in the lab and answer the following questions:

1. Approximately how much time was taken by the booting process _____
2. Which OS is installed on your computer _____
3. Which Version of OS is installed on your computer system. _____

TYPES OF OPERATING SYSTEM:

Dobo and his father were not able to watch the movie online as they were unable to download it.

Father: Dobo, let us try to book the movie tickets online.

Dobo: (excitingly): Yes father!!

Father: Oh! There are no seats available in online booking. Let us go to the movie hall and book the tickets there.

Dobo and his father went to the movie hall to get the movie tickets. He saw three queues at three different counters, which were booking movie tickets at the same time.

Dobo: How is it possible, father, that at three different counters tickets are being booked for the same movie?

Father: Dobo, it is a **Multi User Operating System** which allows more than one user to book the tickets at the same time. Let me explain this in detail till our turn comes.

Some common **types of Operating System** are:

1. ***Single User Operating System:***

   As the name implies, **it allows only a single user to work on a computer system effectively.**

   Example: This kind of operating system can be found on a mobile phone. There can only be one user using the mobile and that person is only using one of its applications at a time.

   Example: **Windows OS, Mac OS, MS DOS.**

2. ***Multi User Operating System :***

   It allows two or more users to work on a single computer at same time/different time.

   Example: **Unix, A video game in which several players play simultaneously.**

ACTIVITY :

Play the game on the types of Operating System by clicking on the links given below:

1. http://www.teach-ict.com/gcse_new/computer%20systems/operating_system_types/quiz/ontarget_operating_system_types.htm
2. http://www.teach-ict.com/gcse_new/computer%20systems/operating_system_functions/quiz/ontarget_operating_system_functions.htm

(B) UTILITY SOFTWARE:

After coming back to home Dobo's mother asked him to complete the home assignment. Dobo started working on his computer system to prepare a presentation. He had some pictures saved in his pen drive. He tried to open the pen drive but was unable to do so. He asked his father to help him.

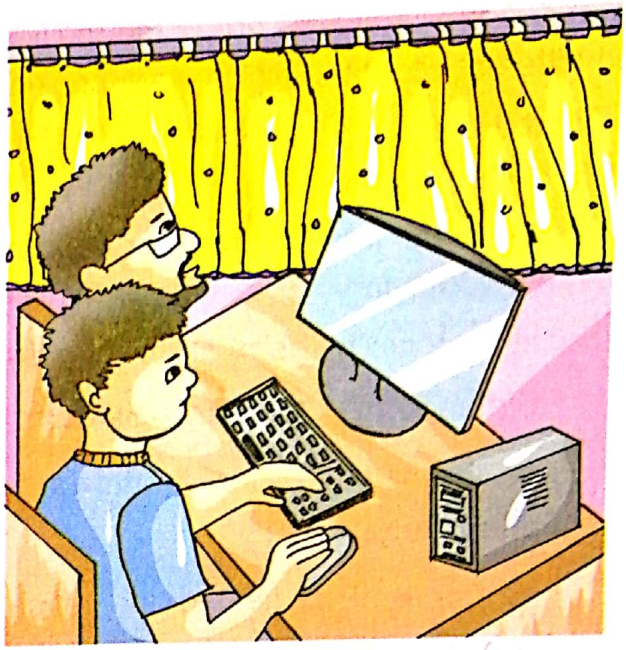
His father said, Dobo this pen drive has Virus!

Dobo: Virus!! What should we do now, father? It may get fever soon. Let us call a doctor for help and give it medicine.

Father: No...No...No need! I have a solution.

Dobo: What is it father? Are you a computer doctor?

Father: Yes sort of! I am a software engineer. We can use one of the utility software called Anti-virus software.



Father: **Anti-virus software is a type of Utility Software. It helps us to detect, remove virus from our computer system and also prevent our system from being getting infected or attacked by Virus.**

1. Utility software are the programs that ensure the smooth functioning of the computer system.
2. It keeps our computer system efficient and trouble free.
3. It manages the computer hardware, operating systems etc.

Dobo: What is Anti-virus software?

Example: Backup utility, Compression Utility, Anti-virus software, etc.

ACTIVITY :

A. View the video by typing (using) the link given below on Utility Software and answer the questionnaire:

Link: http://study.com/academy/lesson/systems-software-utility-software-device-drivers-firmware-gui.html

1. If we are using computer for searching images on internet, do we use Utility Software? Yes/No
2. Name the examples of Utility Software mentioned in this video. _____
3. What does a Backup Software do? _____

_____

(II) APPLICATION SOFTWARE:

Dobo visited the electricity office with his father to pay electricity bill. He observed his father using a huge machine to pay the bill (Kiosk).

Dobo: Father it is such a huge machine! What is it? What does it show?

Father: It is a Kiosk. It helps us to complete our task. It helps us to pay the bills.

Dobo: How?

Father: It has an **application software which solves our problem or help us to do a specific task.**

DO YOU KNOW

Kiosk: It is an electronic machine (including a computer and a display screen) from which newspapers, refreshments, tickets etc. are sold.

Application software are a set of programs designed to solve a specific problem or do a specific task. For example, **OpenOffice Writer, OpenOffice Impress, Electricity billing System, Library Management System, Railway booking system** etc.

ACTIVITY :

Dobo's Maths teacher asked him to make a Line chart, Pie Chart, Column Chart and a Bar Chart on Computer for a particular problem.

Can you suggest Dobo, the type of Application Software which he can use to solve his problem? _____

TYPES OF APPLICATION SOFTWARE:

After withdrawing money from ATM, Dobo and his father went to a bicycle shop.

Father: Sir, we want to purchase a Bicycle.

Shopkeeper: We have 3 types of bicycles:

(i) General Bicycles: The ones that are used in the city.

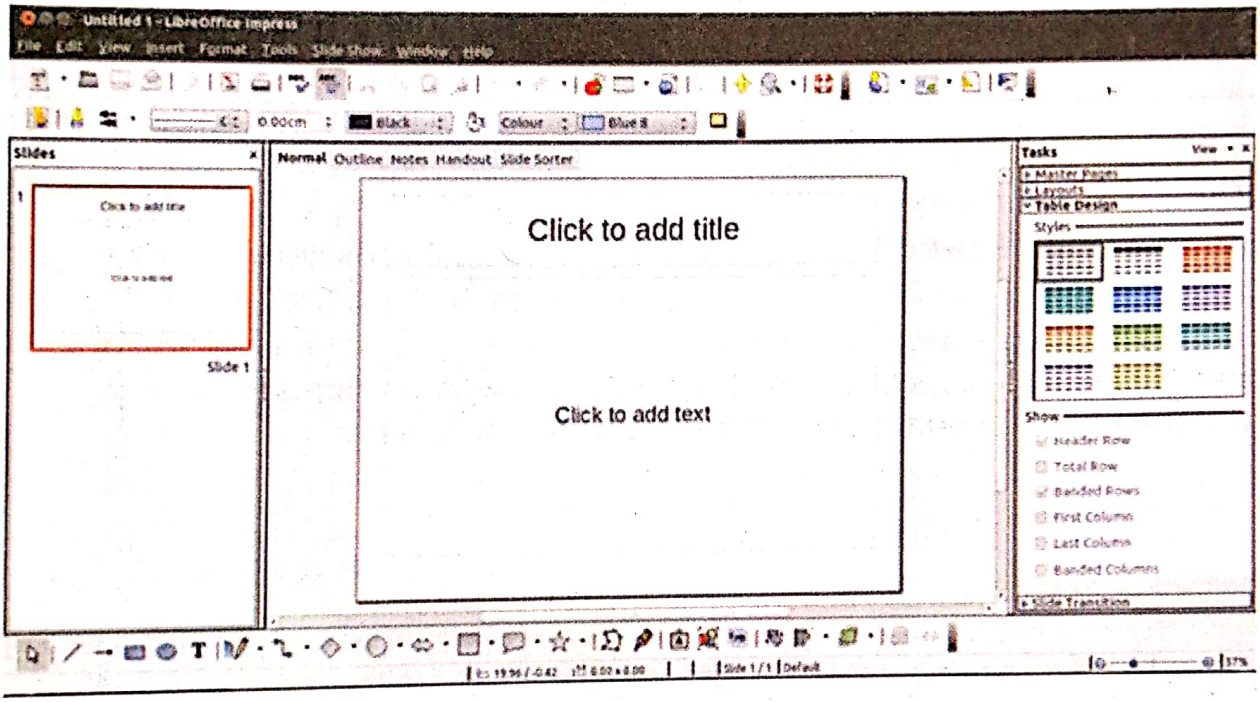
(ii) Specific Purpose Bicycles: These bicycles are mountaineering cycle, adventure cycle etc.

(iii) Customized Bicycle: This bicycle is made or customized according to the needs of the user. Example: user asks us to add extra features like lights, Special gears etc. Which one you wish to buy?

Father smiled and told Dobo that just like bicycles, Software are also of three types.

1. **General Purpose Software**: Anyone can purchase the software, use it but cannot make modifications to it.

   Example: Word-Processing software, Spreadsheet Software, Multimedia Software.



2. **Specific Purpose Software**: Sometimes organizations need some specific features in the software. So ***software has to be customized as per their needs or requirements. This type of software is called Specific Purpose Software.***

   Example: A chess game, it will allow us to play chess.

   Web Browser, Calendar, Calculator are some examples of Specific Purpose Software.

3. **Custom Software**: This software is ***tailor made software. This software is developed to meet all the requirements specified by the user.***

   Example: a company wants to computerize Accounts department and gets a software developed according to its need.

Example: Software made for **Hotel Management, Hospital Management** etc.

ACTIVITY :

WHO AM I ACTIVITY?'

Divide the class into groups. Let each group be assigned one type of software. Each group will tell two or more characteristics of the software and the other groups will identify the type of software.

RESEARCH ACTIVITY :

SURVEY YOUR SCHOOL: Find out all the different types of software being used in School Library and the Accounts department. Write you findings in space provided.

SOFTWARE LICENSE:

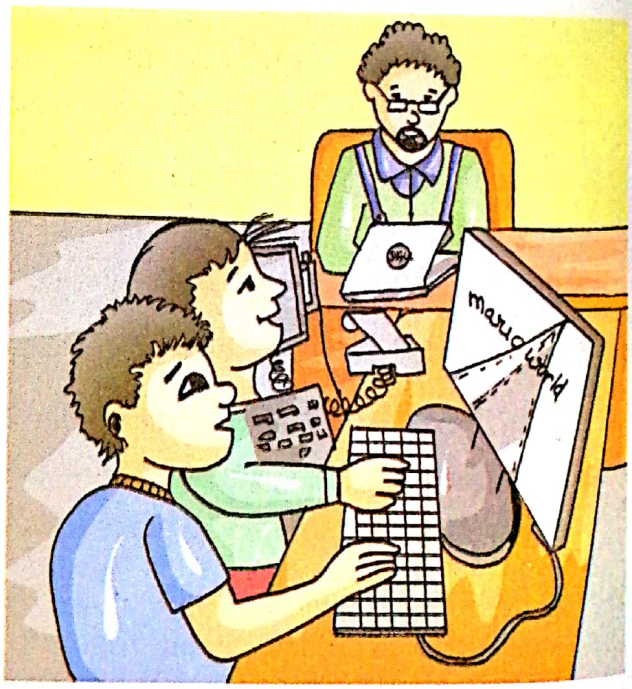
Tobo and Dobo were playing a car racing game on computer.

Tobo: Dobo this game is very interesting. Can you give me this game?

Dobo: Yes! Let me ask my father for it.

Dobo: Father, Tobo wants to take the car racing game. Can we give it to him?

Father: Tobo, if you want to install this game on your computer then you need to purchase it from the market. As this game requires a **software license**.



Dobo: What is Software License? Is it similar to driving license?

Dobo's Father: No, not really. **Software License is a license agreement on the use and distribution of the software**. This game can be used on only one computer. If we want to use it on different computers, then we need to purchase separate copies for each computer.

This is also called as "***Software Licensing that defines conditions on the use of software".***

Dobo: I am still not sure on this!

Father: Okay! When you are not well and you visit a doctor, he gives you prescription of medicines and we pay him money. Similarly, software is an **intellectual property** of the person(s) who made it and we should pay them money for their hard work. Hence, we should follow the licence agreement and should not make illegal copies of software.

Dobo's father further explained that there are, however, some software which are free.

As some people put the software on Internet and allow everyone to use it and do not ask for money, such software(s) are **Open Source software and are open to all for use.**

Father: Based on licensing policy softwares can be further divided into:

OPEN SOURCE SOFTWARE

The software for which programming code is available to the users in order to:

(a) **Read it**, and

(b) **Make changes**,

(c) **Build new versions of the software** according to one's requirements by modifying it, is called **Open Source Software**. ***It can be distributed freely and used by everyone free of cost.***

Example: **OpenOffice Software, Mozilla Firefox, Android Operating System** etc.

DO YOU KNOW

Programming Code: Computer instructions written in a programming language.

It is Dobo's birthday. All his friends are invited. Dobo's mother baked chocolate cake at home.

Tobo's mother also brought Pineapple cake from a new bakery. The new bakery was giving free cakes to its first 50 customers.

Dobo's Friend Tom: Both the cakes are delicious.

Tom's Mother: Can you share the recipe of these cakes?

Dobo's Mother: Yes sure. I can share recipe of Chocolate Cake but cannot share the recipe of Pineapple cake as Tobo's mother has brought from the bakery.

Then Dobo's Mother shares the recipe with Tom's Mother.

Dobo's father who was listening to this conversation said, Oh! this is like **"Proprietary software".**

PROPRIETARY SOFTWARE OR CLOSED SOURCE SOFTWARE:

The pineapple cake purchased from the bakery can be compared to Proprietary or closed source software as we cannot make any changes or modifications in it.

Proprietary software doesn't allow people to look at its code or modify it and restrict its distribution. Such software can be freely available or can be purchased.

Example: **Microsoft Windows, Microsoft Office, Mac-OS , iOS** etc.

The chocolate cake made at home can be compared to Open Source Software as its recipe can be shared and modified according to personal taste.

FREEWARE SOFTWARE:

The Pineapple cake bought by Tobo's mother from a new bakery can be compared to Freeware software. It was free of cost, as it was promotional offer by the bakery.

The software which is:

(a) Made available free of cost to the user

(b) It is not necessarily free to be used, copied, modified and redistributed.

Example: **Open source software is freeware and some proprietary software are also freeware.**

Example: **Windows Movie Maker** is a Proprietary software as well as freeware software.

ACTIVITY :

Research and find out some examples of Open Source, Proprietary, Freeware software and complete the table given below:

TYPE	EXAMPLES
Open Source Software	1. _____ 2. _____
Proprietary Software	1. _____ 2. _____
Freeware Software	1. _____ 2. _____

ASSESSMENT ACTIVITY

1. (i) Go to the Computer Lab and try to find out the different examples of application software. Write these names in Column 'A'.

   (ii) Identify each of the icons shown below in Column 'B' and write name in the space provided below.

S.NO	'A' NAME OF APPLICATION SOFTWARE	'B' EXAMPLES
1.	_____	  _____ _____

2.	_____	  _____ _____
3.	_____	  _____ _____
4.	_____	  _____
5.	_____	  _____ _____

2. Find out and list the names of a few Utility software and also try to find out the Terms of licenses for these software.

Utility Software	Terms of License
	1. _____ 2. _____
	1. _____ 2. _____
	1. _____ 2. _____