

# Operating System

Operating System is also known as OS. It is a system software and acts as an interface between the user of a computer and computer hardware. OS is a set of programs and manages all the processes and resources present in the system. It takes input from the keyboard, mouse and coordinates with the hardware to display it on the screen. Operating system helps us to communicate with the computer.

Operating System is the first program loaded in the computer, which runs all other software and programs. It is not possible for the user to use any computer or mobile device without having an operating system. Without an OS, a computer is useless.

## Function

### Types of Operating System :-

#### 1. Memory Management :-

- (a) Memory Management Manages the memory space of main memory.  
 (b) It allocates or deallocate the memory space of main memory.

#### 2. Process Management :-

- (a) Process management manage the process Main memory to CPU or terminate the process.  
 (b) Process load main memory to CPU is called "CPU scheduling".

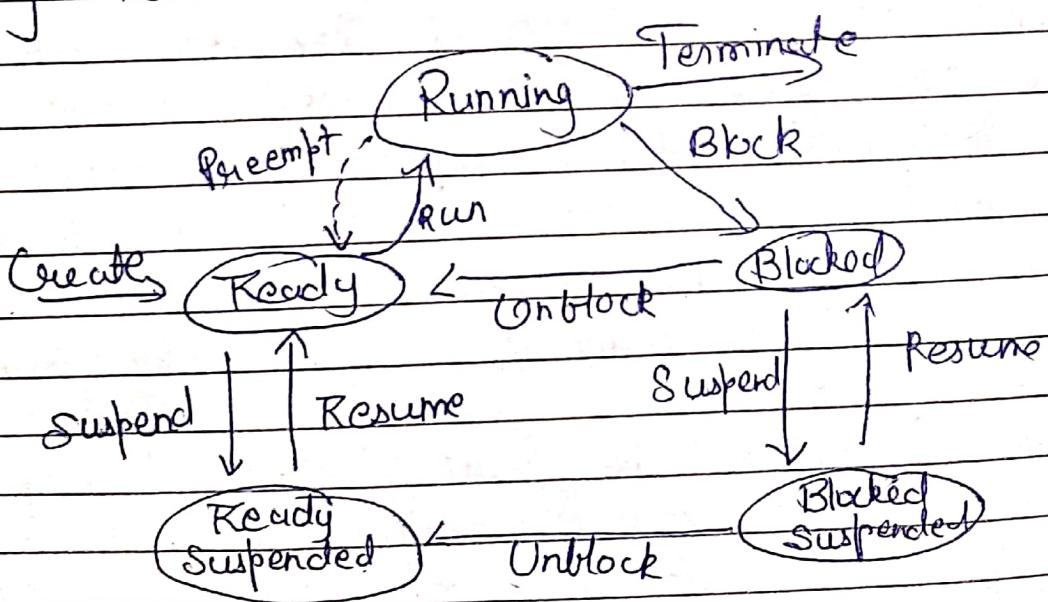


fig. Processor Management

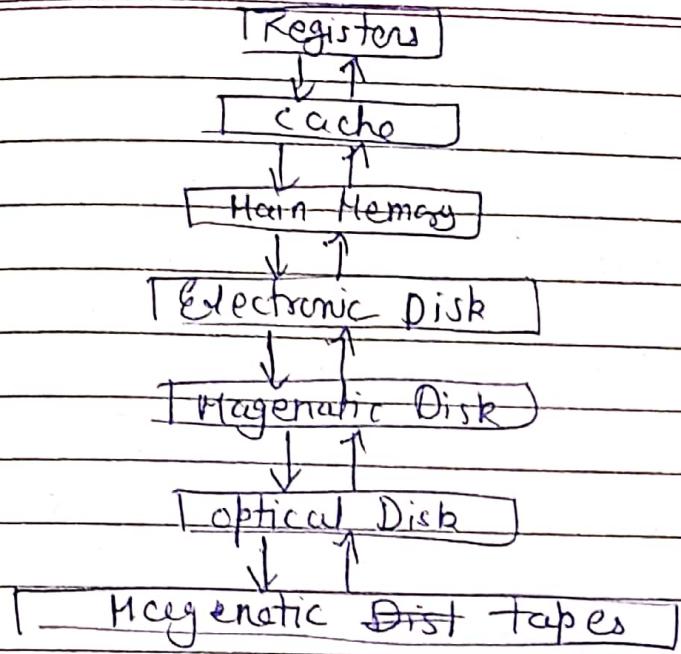


fig. Memory Management-

### 3. Security / Privacy Management :-

(a) Security / Privacy Management  
Provide Privacy so that unauthorized application can't access the data.

(b) e.g. windows uses Kerberos authentication.

### 4. Resource Management :-

(a) Resource Management  
Manage the resource like hardware or software.

(b) e.g. If multiple user accessing the system so Resource Management has responsibility to provide hardware to the user.

5. Storage Management :- (a) Storage Management provides logical view of information storage.

(b) Storage Management abstracts from the Physical properties.

6. File Management :- (a) It manages files and device such as hard disk, USB flash drive and DVD.

(b) It allows computer user to perform operations such as creating, copying, deleting, moving and renaming.

A file System is organized into Directories for efficient or easy navigation and usage. These directories may contain other directories and other files. An Operating system carries out the following file management activities. It keeps track of where information is stored, user access settings, the status of every file and more.

Basic file System

↓  
Access Control Module

↓  
Logical file System

↓  
Physical file System

↓  
Device Interface Module

↓  
Device

7. Network Management :-
- \* It monitors and manages the resource of a network.
  - \* It allows to create user groups and assigns privileges to them. It share network resources.

## 8. User Interface or command Interpreter :-

The user interacts with the computer system through the operating system. Hence OS acts as an interface between the user and the computer hardware. This user interface is offered through a set of commands or a graphical user interface (GUI).



Command Interpreter

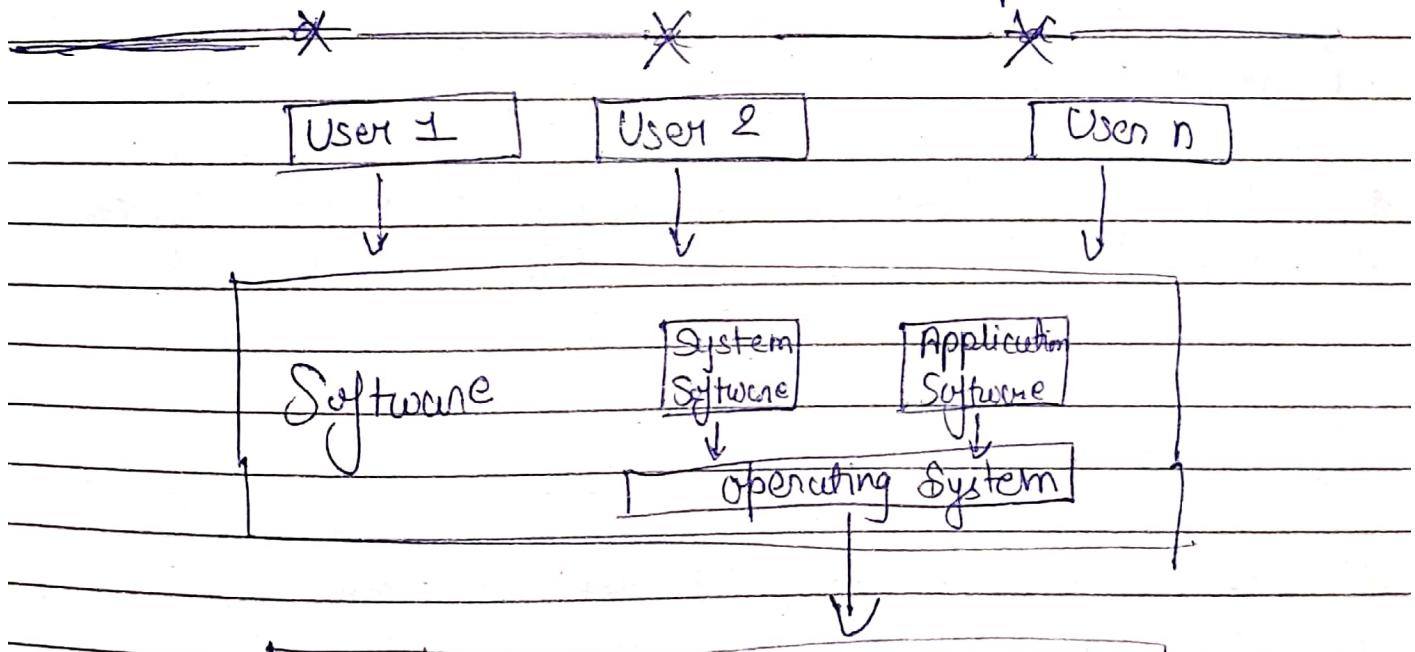


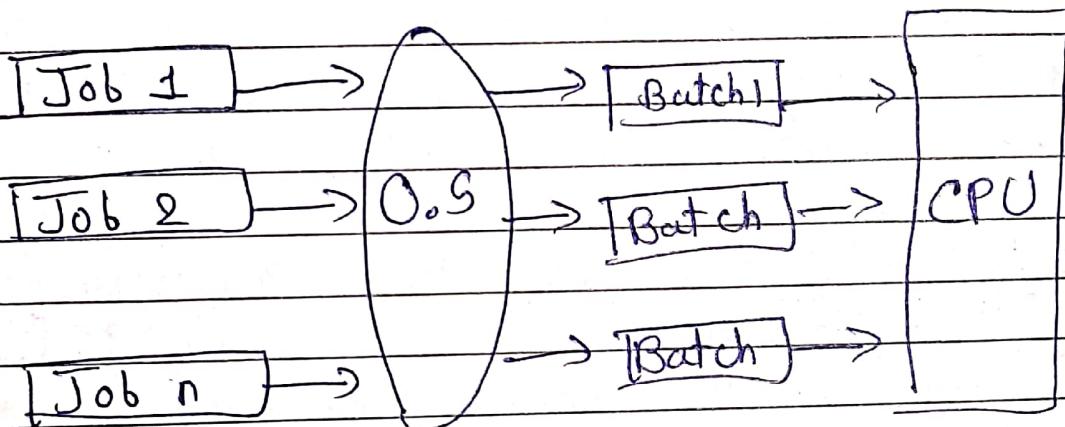
Fig :- operating System

## # Types of Operating System :-

There are several types of operating systems which are mentioned below.

1.

- \* **Batch Operating System**:- This type of operating system does not interact with the computer directly. There is an operator which takes similar jobs having the same requirements and groups them into batches.



### Advantages :-

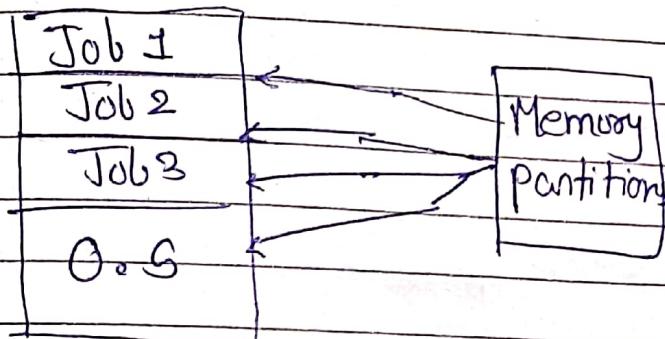
- \* Multiple users can share the batch system.
- \* The idle time for the batch system is very less.

### Disadvantages :-

- \* Batch system are hard to debug.
- \* It is sometimes costly.

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PAGE

2. Multiprogramming Operating System :- can be simply illustrated as more than one program is present in the main memory and any one of them can be kept in execution. This is basically used for better utilization of resources.



Ans:- ① Multiprogramming increase the throughput of the system.  
② It helps in reducing the response time.

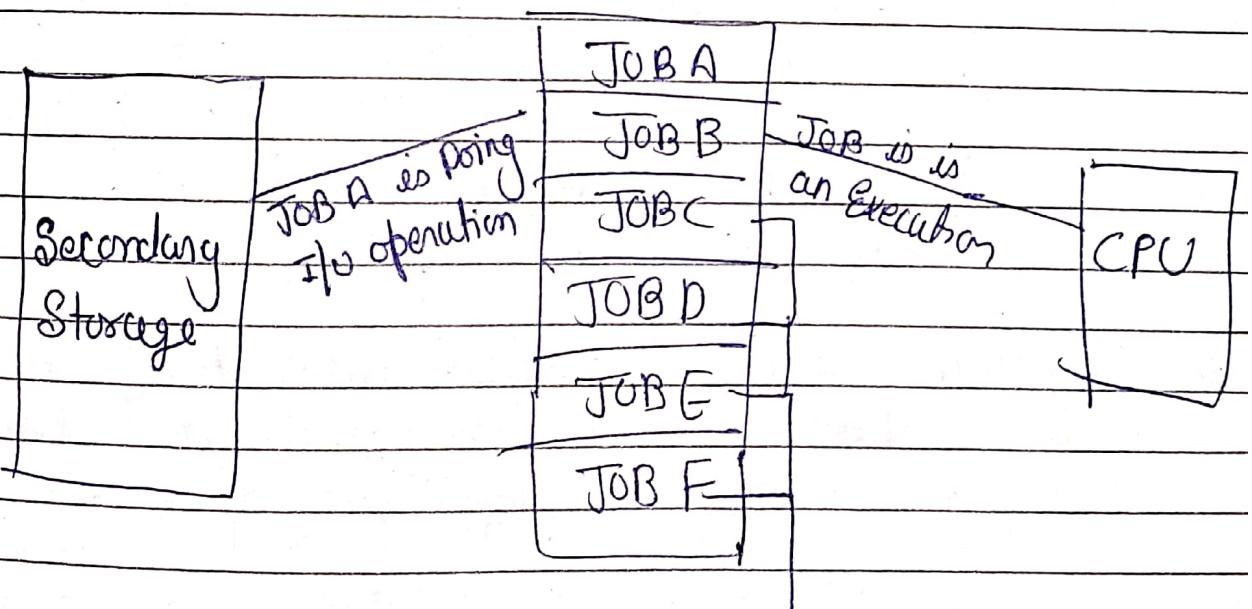
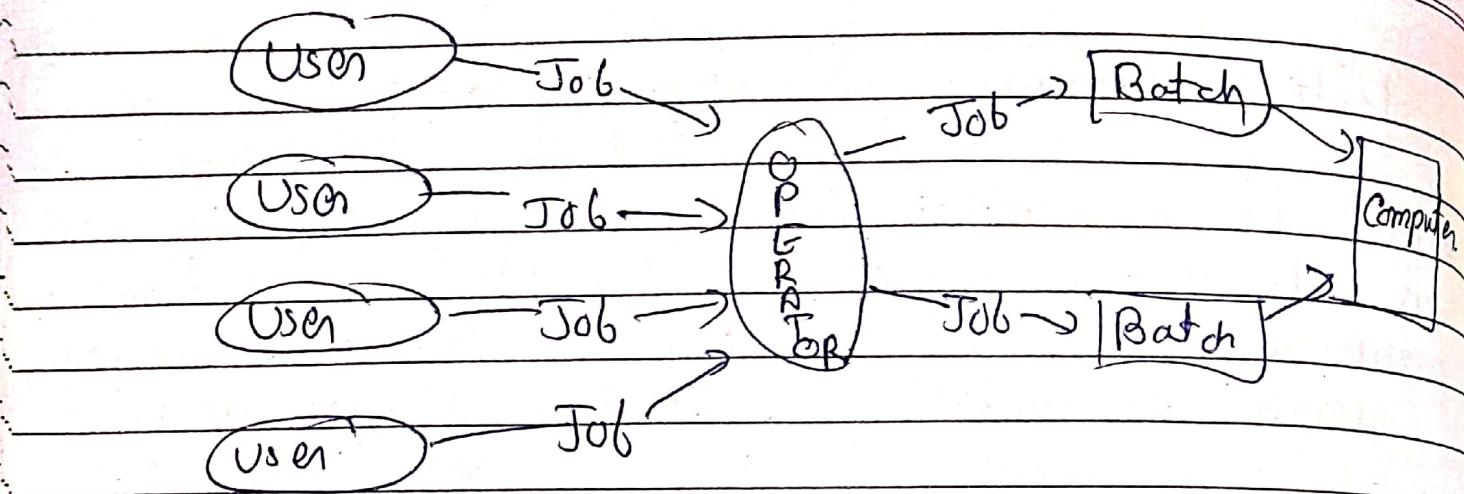
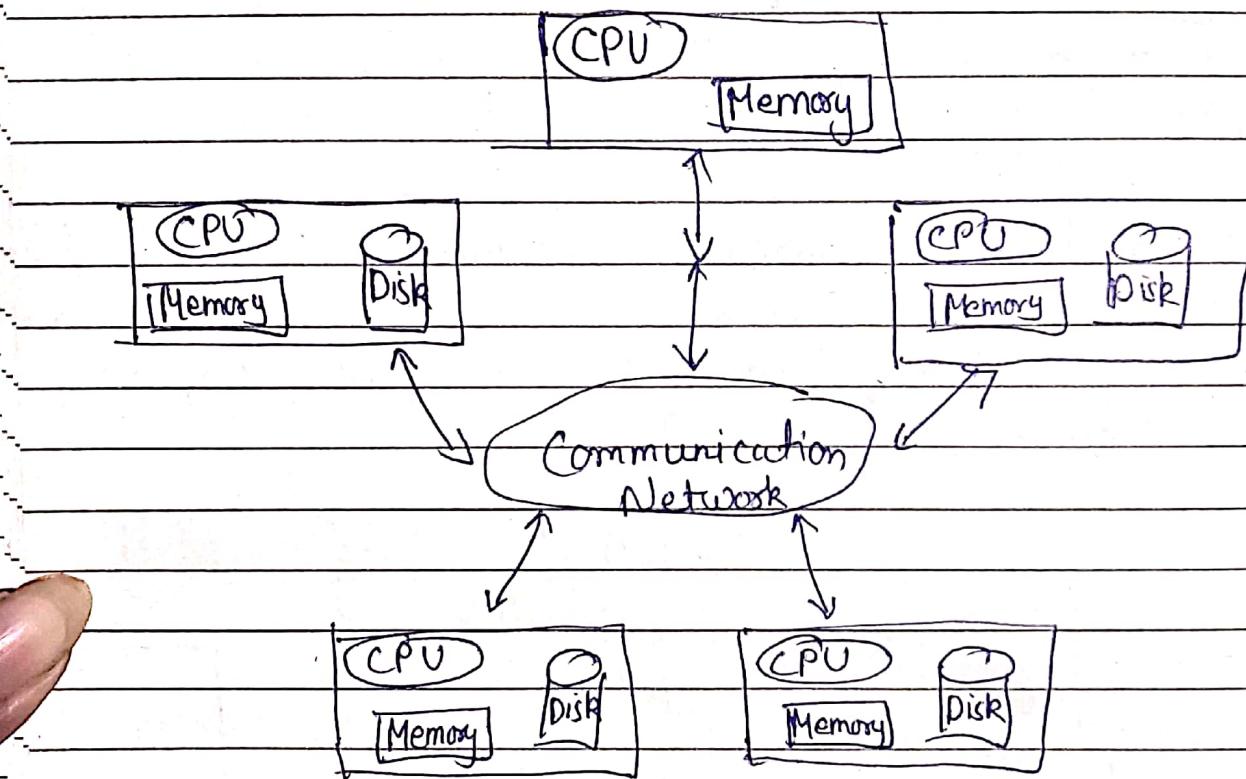


Fig:- Multiprogramming  
O.S.

JOB C, P, E, F  
Are waiting for CPU



### 3. Distributed OS :-



\* Failure of one System will not affect the other Systems because all the computers are independent of each other.

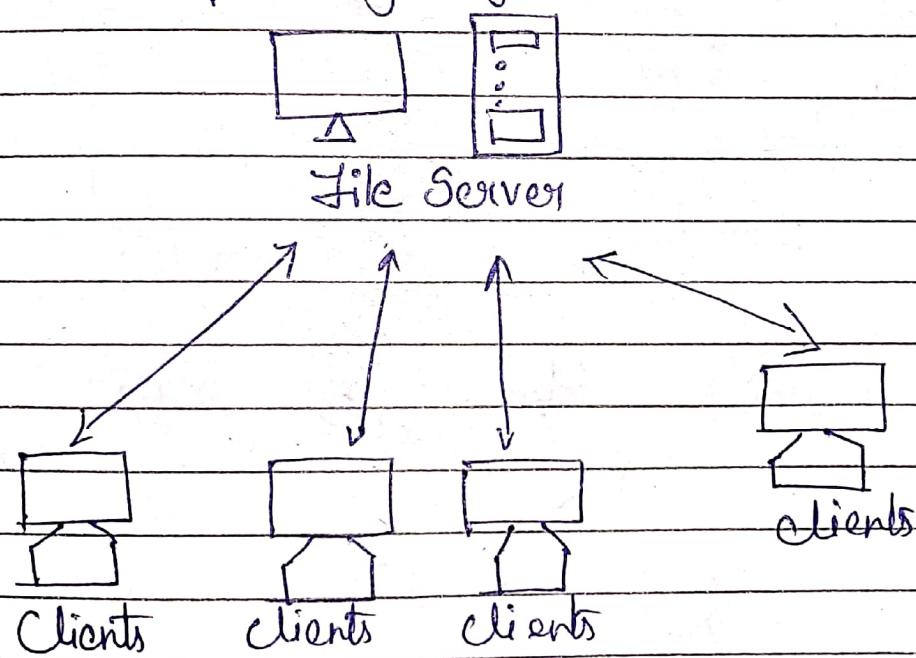
\* The load on the host System is reduced. With resource sharing facility, a user at one site may be able to use the

resource available at another.

### Disadvantages :-

- \* Failure of the main network will lead to the failure of the whole system.
- \* The setup cost is high. Software used for such systems is highly complex.

### 4. Network Operating System :-



These systems run on a server and provide the capability to manage data, users, groups, security, applications, and other networking functions.

These types of operating systems allow shared access to files, printers, security, applications, and other networking

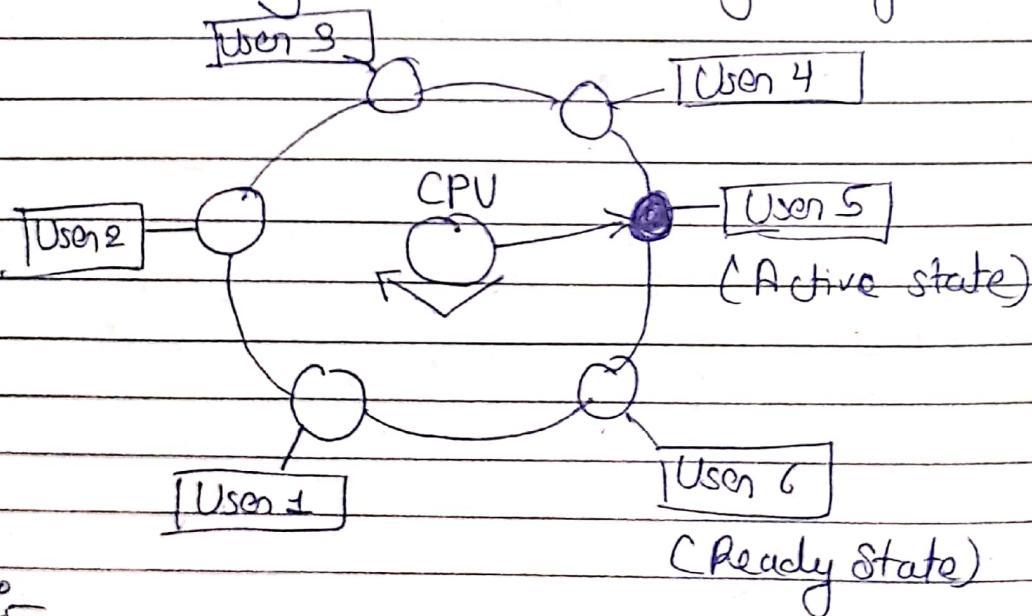
functions over a small private network.

## Popular Network OS :-

- ① Windows NT ② Linux ③ Unix ④ Mac OS
- ⑤ Window Server 2003 ⑥ Window Server 2008

## 5. Time Sharing Operating System :-

These System are also known as Multitasking Systems. Each task is given some time to execute so that all the tasks work smoothly. Each user gets the time of the CPU as they use a single system.



Adv :-

- Each task gets an equal opportunity.
- CPU idle time can be reduced.

Dis :-

- Data Communication Problem.
- Complexity.

6. Real time Operating System :- They are used when there are time requirements that are very strict like missile systems, air traffic control systems, robots etc.

Types of RTOS :-

- ① Hard Real time Operating System.
- ② Soft Real time operating system.
- ③ HRTOS :- doesn't accept any delay even the shortest possible delay in the processing time. Here the time constraint is very strict.
- ④ SRTOS :- This is used for application where time constraint is not very strict.

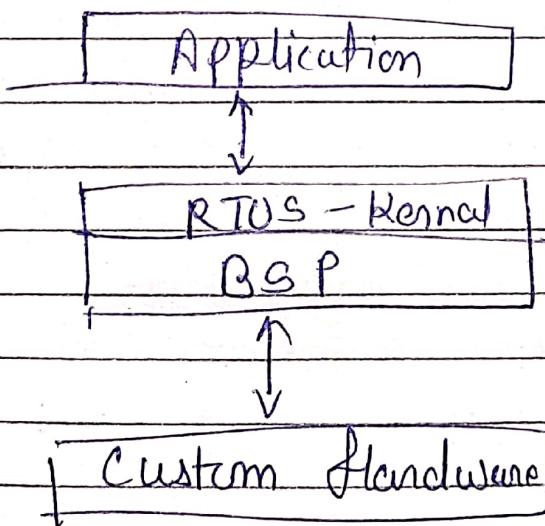
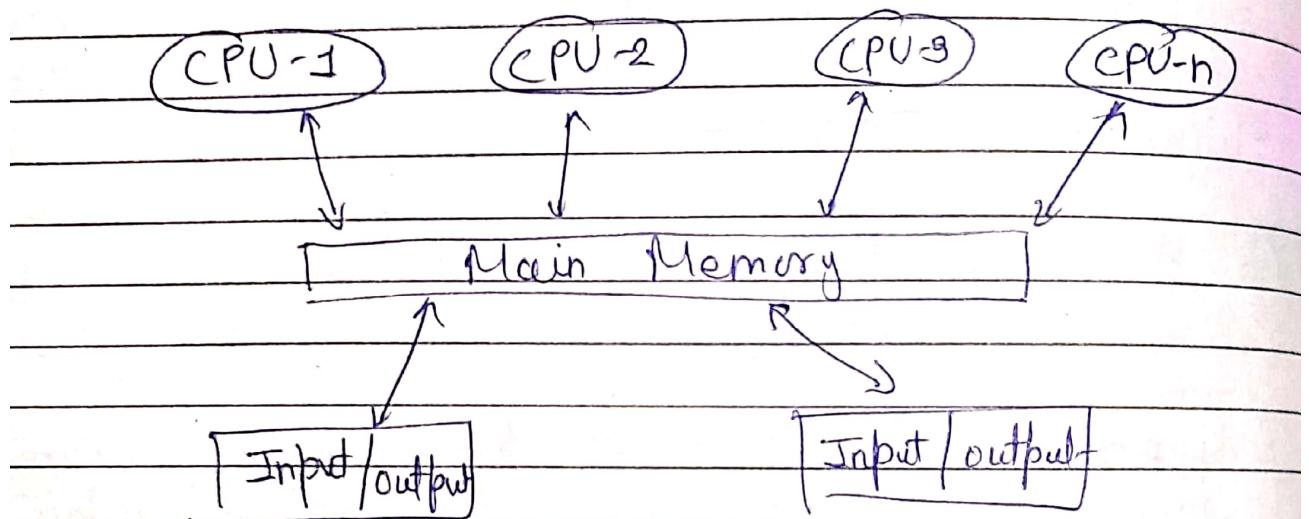


fig. Real time OS

7. Multiprocessing OS :- Multiprocessing OS is not for normal users, It is actually used in super computers.



It is a type of Operating System in which more than one CPU is used for the execution of resource. It better's the throughput of the system.

8. Embedded OS :- is a Computer operating system designed for use in embedded computer systems. It has limited features. The main goal of designing an embedded operating system is to perform specified tasks for non-computer devices.

## # File Management :-

- \* Managing file system to enable user to keep their data safely and correctly is an important function of OS.
- \* Managing file system by OS is called file management.
- \* File Management provides tools for these file related activities:-
  - 1. Creating new file for storing data
  - 2. Updating
  - 3. Sharing.
  - 4. Recovery in case of system failure
  - 5. Securing data through password and ~~the~~ encryption.

## \* Attributes of file:-

- 1. New folder
- 2. Drag / Drop
- 3. File Size
- 4. Rename
- 5. Delete
- 6. Restore
- 7. Copy / Paste
- 8. Cut
- 9. Shortcut
- 10. file time stamp and modify.

## # Introduction of MS Word :-

Microsoft word is a word processor software developed by Microsoft in 1983.

\* It is the most commonly used word processor software.

\* It is used to create professional quality documents, letters, reports, resume etc.

\* It also allows you to edit or modify your new or existing document.

\* The file saved in MS Word has .docx ~~document~~ extension.

## Features of MS Word :-

1. File :- It contains options related to the file like New, Open, Save, Save as, History, print, Share, Export etc.

2. Home :-

3. Insert

4. Draw

5. Design

6. Layout

7. References

8. Mailings

9. Review

10. View

## # Introduction of MS Excel :-

- \* MS Excel is a spreadsheet program where one can record data in the form of tables. It is easy to analyse data in an excel spreadsheet.
- \* A spreadsheet is in the form of a table comprising rows and columns.
- \* The rectangular box at the intersection point between rows and column from a cell.

## Features of MS Excel :-

- ① Home
- ② Insert
- ③ Page Layout
- ④ Formulas
- ⑤ Data
- ⑥ Review
- ⑦ View

## Benefits of Using MS Excel :-

- ① Easy to store Data
- ② Easy to Recover Data
- ③ More Secure
- ④ Application of Mathematical Formulas
- ⑤ Data at One place

## Differences Between MS Word and MS Excel

### Parameters

#### MS Word

#### MS Excel

##### \* Definition

MS Word is an application software that is used for word processing in office.

MS Excel is an application software that is used for word processing, organizing and analyzing data in spreadsheet format.

##### \* Main Function

MS Word is primarily designed to create and edit text based documents like letters, reports etc.

MS Excel is mainly designed to organize and analyze data using formula and function.

##### \* File

The file created in MS Word is called a document file.

The file created in MS Excel is called a workbook.

##### \* File Extension

The file extension of the file of MS Word is ".doc" or ".docx"

The file extension of the file of MS Excel is ".xls" or ".xlsx"

\* Document structure

The Document in MS Word is structured in multiple pages.

The Document in MS Excel is structured in spreadsheet.

\* Statistical data

MS Word is not suitable for organizing and analyzing statistical data.

MS Excel can be used for organizing and analyzing statistical data.

\* Tables

MS Word supports basic tables where data can be arranged in a tabular structure.

MS Excel supports a much advanced table that can be used as a data analysis tool, as it supports a number of tools.

## # System Software VS Application Software

### System Software

### Application Software

1. System Software maintains the system resources and gives the path for application software to run.

Application software is built for specific tasks.

2. Low-level languages used to write the system software.

While high-level languages are used to write the application software.

3. It is general-purpose software.

While it's a specific purpose software.

4. Without System Software the system stops and can't run.

While without application software system always runs.

5. Example:- System Software is an operating system.

Example:- Application Software is photoshop, VLC player etc.

6. System Software programming is more complex than application software.

Application Software programming is simpler in comparison to system software.

1. System Software runs independently.

Application software is dependent on System software.

# What are the input device? Explain the description of input device

⇒ An input device is a piece of hardware or software that allows a user to provide data and control signals to a computer or other information processing system.

Here are some examples in input device:-

- ① Keyboard :- Sends textual data to the computer.
- ② Mouse :- Sends location and selection data to the computer.
- ③ Touchpad :- A small, touch-sensitive section on a laptop keyboard that acts as a mouse.
- ④ Trackball :- A version of a mouse where a ball is rolled inside instead of on a flat surface.
- ⑤ Microphone :- An audio input device that records sound.
- ⑥ Webcam :- A video input device that delivers video and audio information to a computer.

- (7) Scanner :- A video input device that sends picture information to a computer.
- (8) Biometric Scanner :- A Scanner that gives real-life images such as fingerprints.