Operating System(OS)

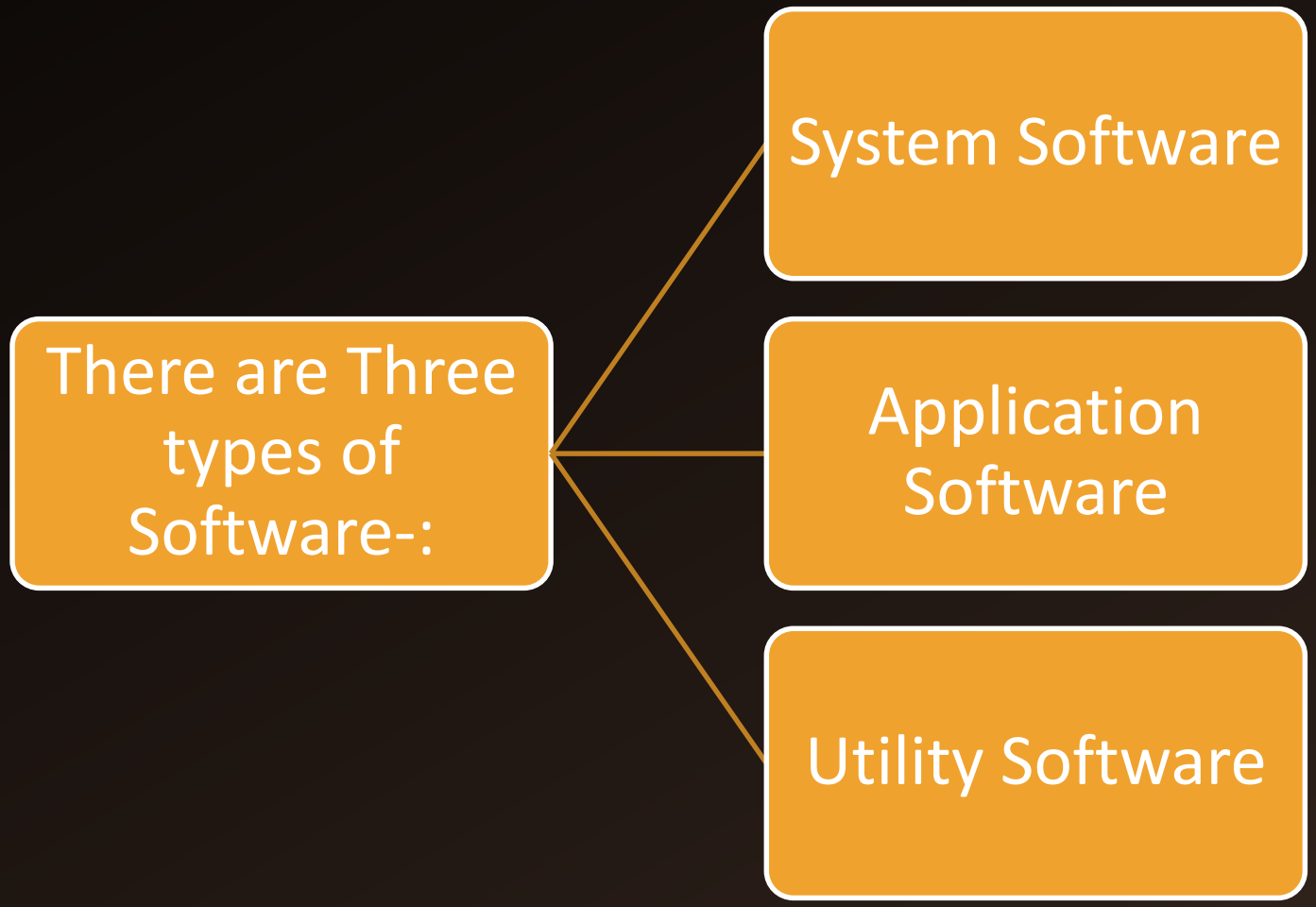
BCA IV SEM OS

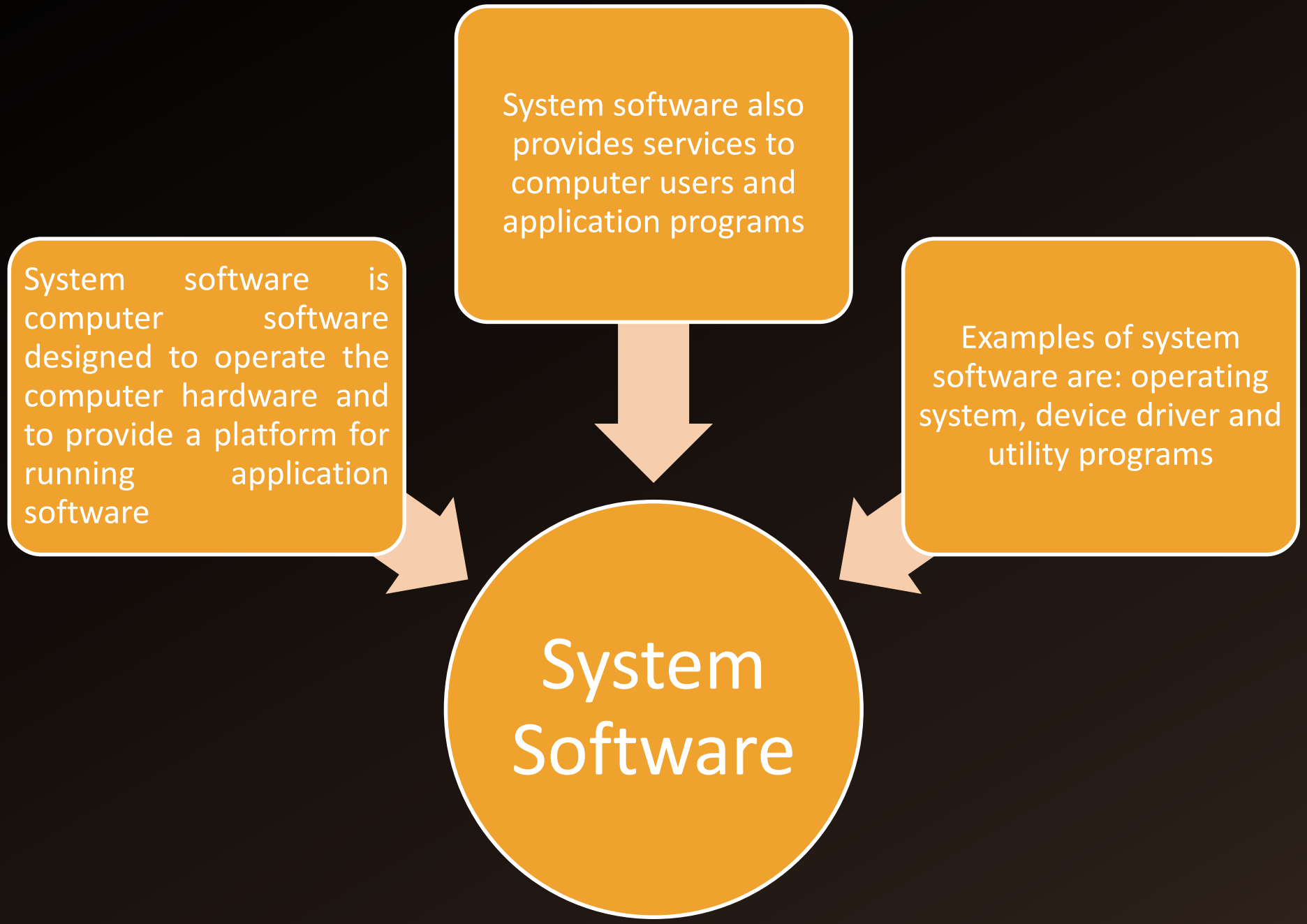
SOFTWARE

AS OPERATING SYSTEM

BASICS OF SOFTWARE

Software is a set of instructions, data or programs used to operate computers and execute specific tasks.




System software also provides services to computer users and application programs
System software is computer software designed to operate the computer hardware and to provide a platform for running application software
Examples of system software are: operating system, device driver and utility programs
System Software

Application software

- Application software (app for short) is a program or group of programs designed for end users.
- Examples of an application include a word processor, a spreadsheet, an accounting application, a web browser, an email client, a media player, a file viewer, simulators, a console Game or a Photo editor.

UTILITY SOFTWARE

is system software Utility Software designed to help analyze, configure, optimize or maintain a computer.

Types of Utility Software:

- Anti Virus Programs
- File managers
- Disk Cleaners

Unit I

(INTRODUCTION TO DATA STRUCTURE AND ITS CHARACTERISTICS ARRAY)

Introduction to OS

Understand

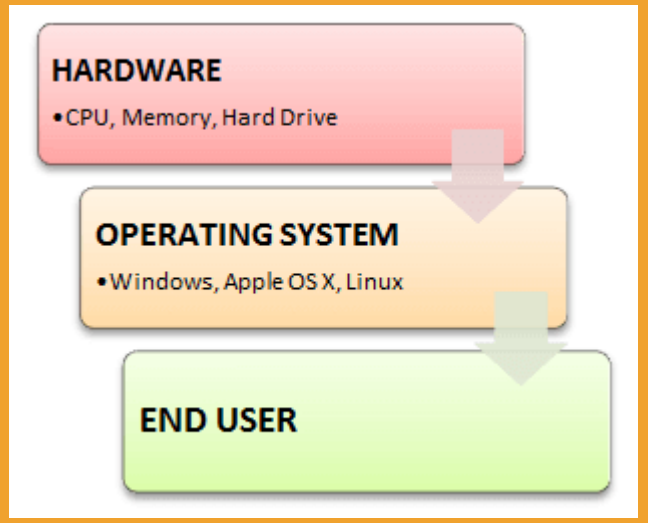
- In the Computer System (comprises of Hardware and software), Hardware can only understand machine code (in the form of 0 and 1) which doesn't make any sense to a naive user.
- We need a system which can act as an intermediary and manage all the processes and resources present in the system.

Definition

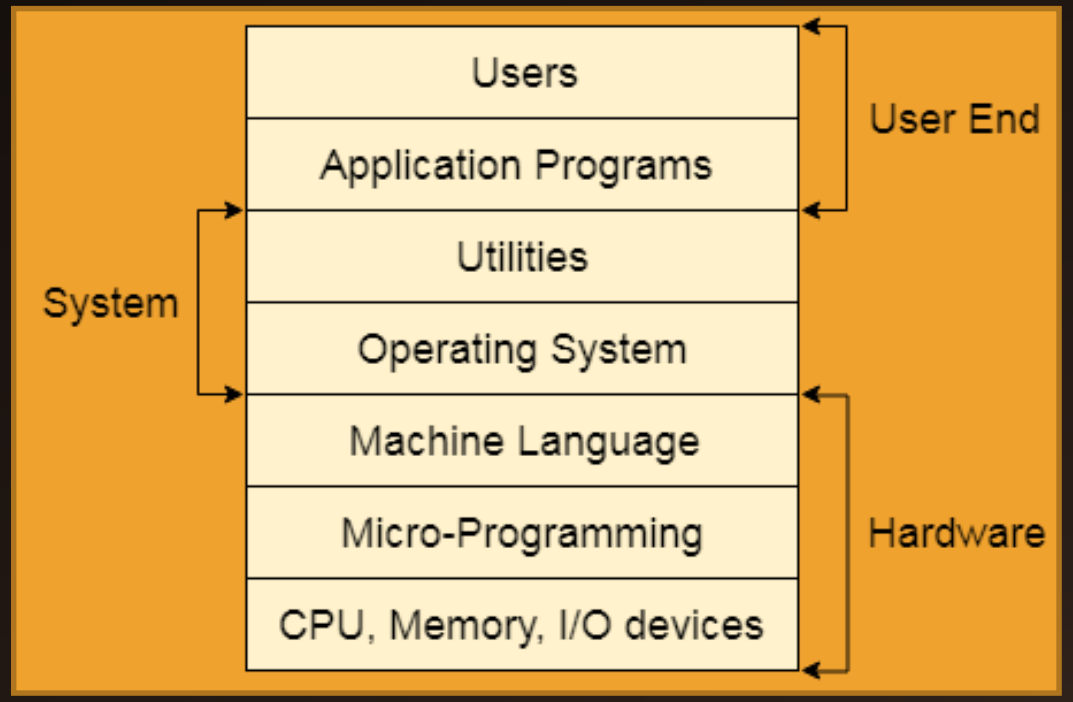
- An Operating System can be defined as an interface between user and hardware. It is responsible for the execution of all the processes, Resource Allocation, CPU management, File Management and many other tasks.
- The purpose of an operating system is to provide an environment in which a user can execute programs in convenient and efficient manner.

components and structure of operating system

COMPONENTS

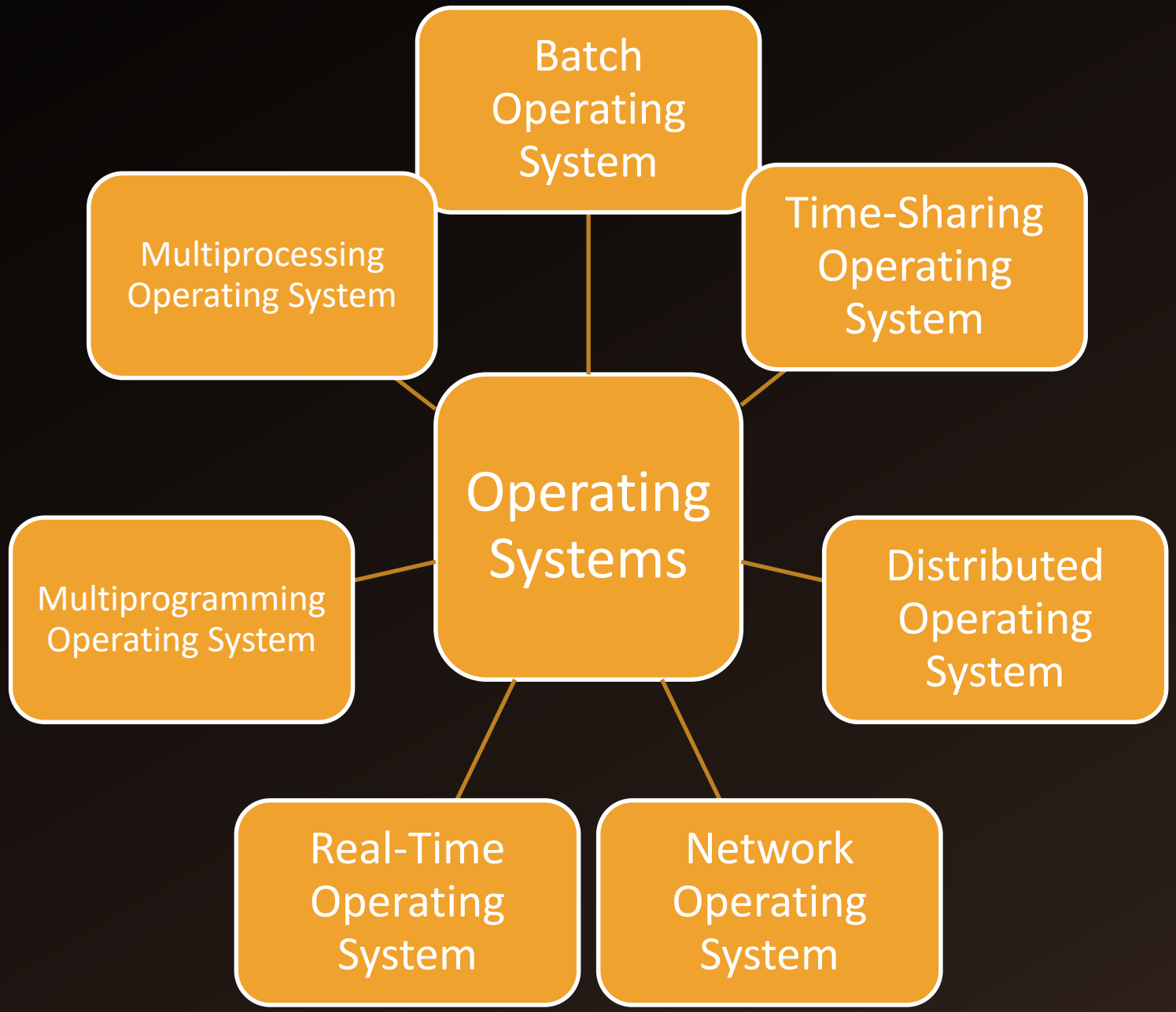


STRUCTURE



What does an Operating system do?

Types of Operating Systems (OS)



BATCH OPERATING SYSTEM:-

In a Batch Operating System, the similar jobs are grouped together into batches with the help of some operator and these batches are executed one by one.

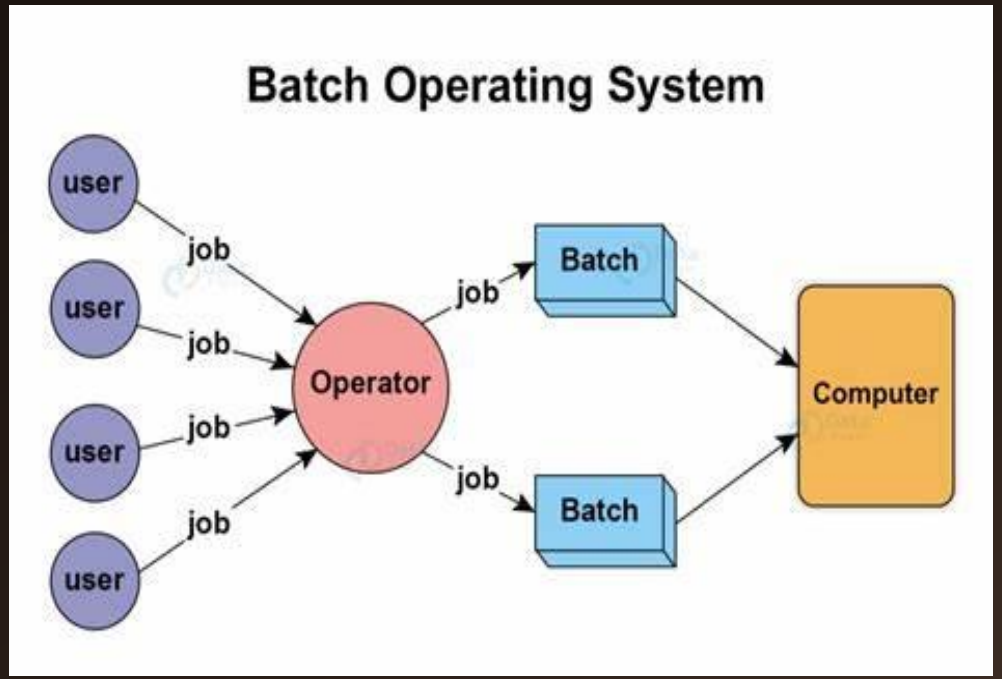
In the 1970s, Batch processing was very popular. In this technique, similar types of jobs were batched together and executed in time. People were used to having a single computer which was called a mainframe.

In Batch operating system, access is given to more than one person; they submit their respective jobs to the system for the execution.

The system put all of the jobs in a queue on the basis of first come first serve and then executes the jobs one by one. The users collect their respective output when all the jobs get executed.

Advantages of Batch OS→ The use of a resident monitor improves computer efficiency as it eliminates CPU time between two jobs.

Disadvantages of Batch OS→ Batch processing take more time .



TIME-SHARING OPERATING SYSTEM:-

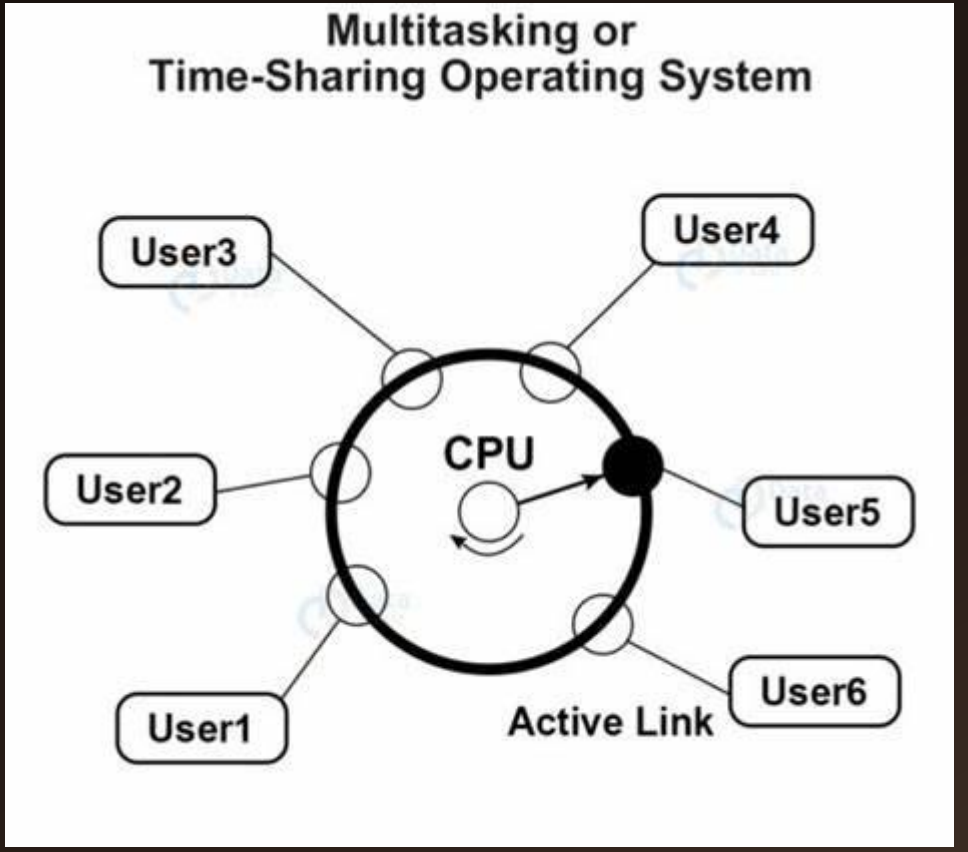
In Time-Sharing Operating System Each task is given some time to execute so that all the tasks work smoothly.

Each user gets the time of CPU as they use a single system.

These systems are also known as **Multitasking Systems**. The task can be from a single user or different users also.

Advantages of Time Sharing Operating System → The time-sharing operating system provides effective utilization and sharing of resources. This system reduces CPU idle and response time.

Disadvantages of Time Sharing Operating System → Data transmission rates are very high in comparison to other methods. Security and integrity of user programs loaded in memory and data need to be maintained as many users access the system at the same time.



MULTIPROGRAMMING OPERATING SYSTEM

Multiprogramming is an extension to batch processing where the CPU is always kept busy. Each process needs two types of system time: CPU time and IO time.

In a multiprogramming environment, when a process does its I/O, The CPU can start the execution of other processes. Therefore, multiprogramming improves the efficiency of the system.

Advantages of Multiprogramming OS→

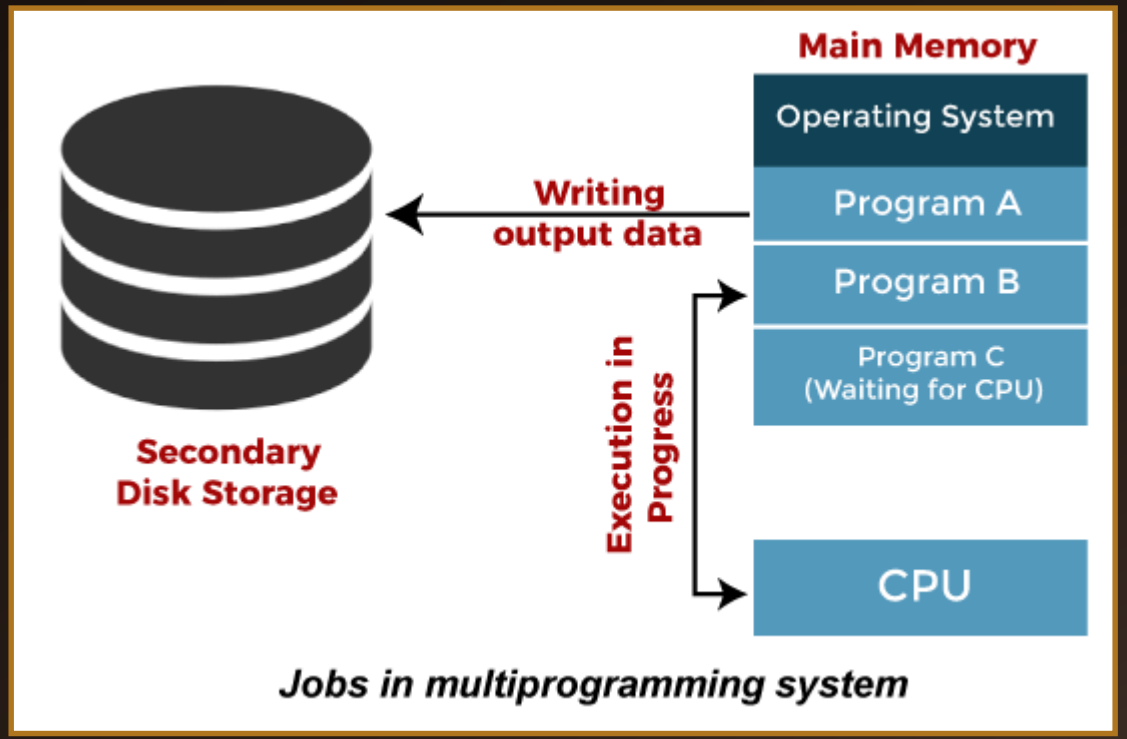
o Throughout the system, it increased as the CPU always had one program to execute.

o Response time can also be reduced.

Disadvantages of Multiprogramming OS→

o Multiprogramming systems provide an environment in which various systems resources are used efficiently, but they

do not provide any user interaction with the computer system.



Jobs in multiprogramming system

MULTIPROCESSING OPERATING SYSTEM

In Multiprocessing, Parallel computing is achieved. There are more than one processors present in the system which can execute more than one process at the same time. This will increase the throughput of the system.

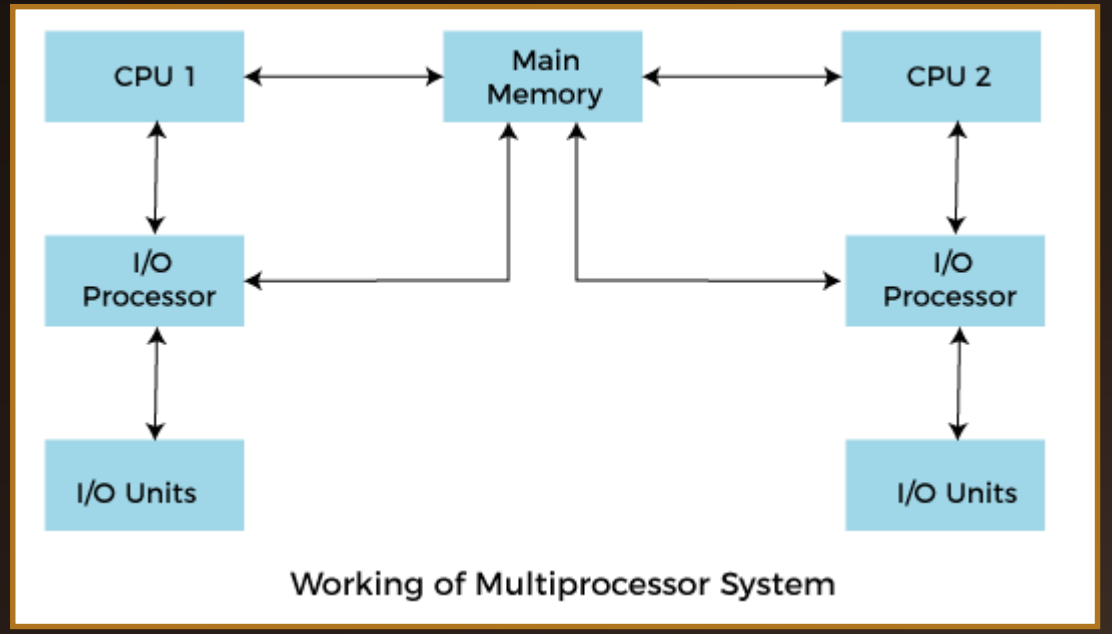
Parallel computing is achieved. More than one processor present in the system can execute more than one process simultaneously, which will increase the throughput of the system.

Advantages of Multiprocessing operating system→

- Increased reliability: Due to the multiprocessing system, processing tasks can be distributed among several processors. This increases reliability as if one processor fails, the task can be given to another processor for completion.
- Increased throughout: As several processors increase, more work can be done in less.

Disadvantages of Multiprocessing operating System→

- Multiprocessing operating system is more complex and sophisticated as it takes care of multiple CPUs simultaneously.



Working of Multiprocessor System

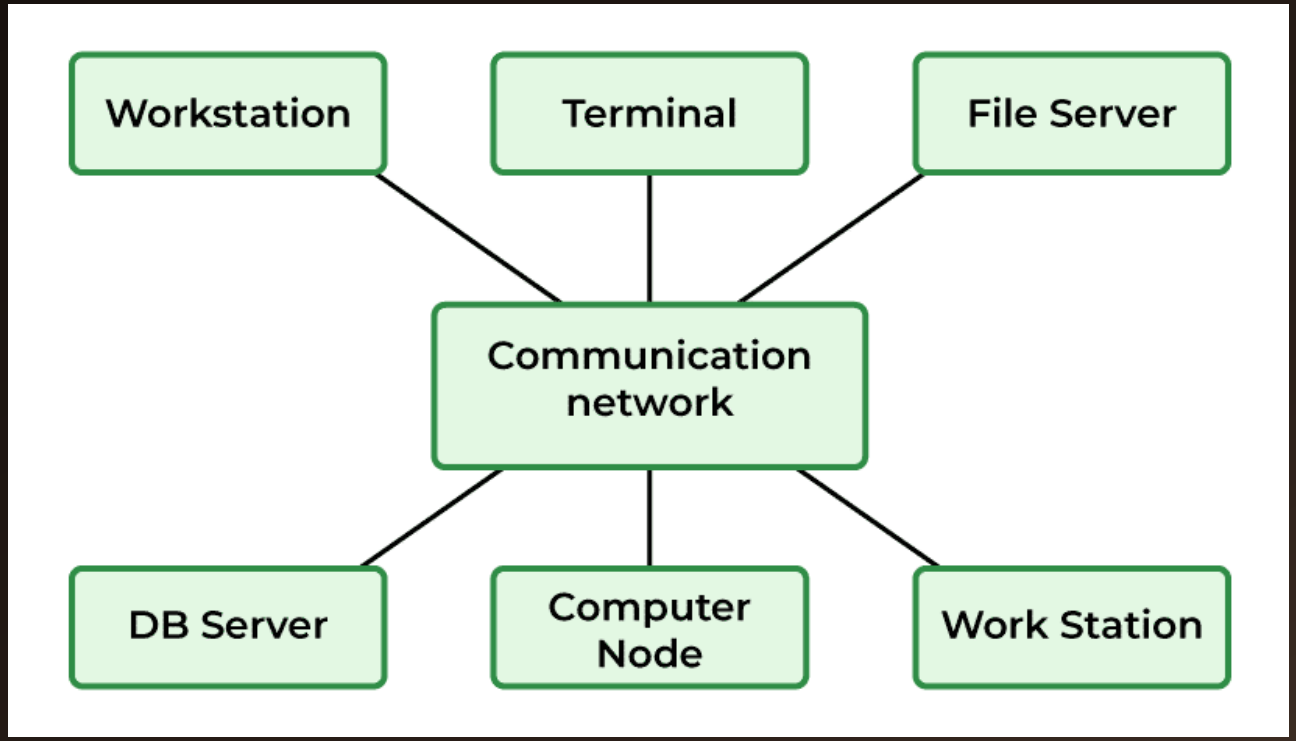
DISTRIBUTED OPERATING SYSTEM

In a Distributed Operating System, e have various systems and all these systems have their own CPU, main memory, secondary memory, and resources.

These systems are connected to each other using a shared communication network. Here, each system can perform its task individually.

Advantages of Distributed Operating System →The distributed operating system provides sharing of resources.
This type of system is fault-tolerant.

Disadvantages of Distributed Operating System →Protocol overhead can dominate computation cost.



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 of files, printers, security, applications, and other networking functions over a small private network.

Advantages of Network Operating System→

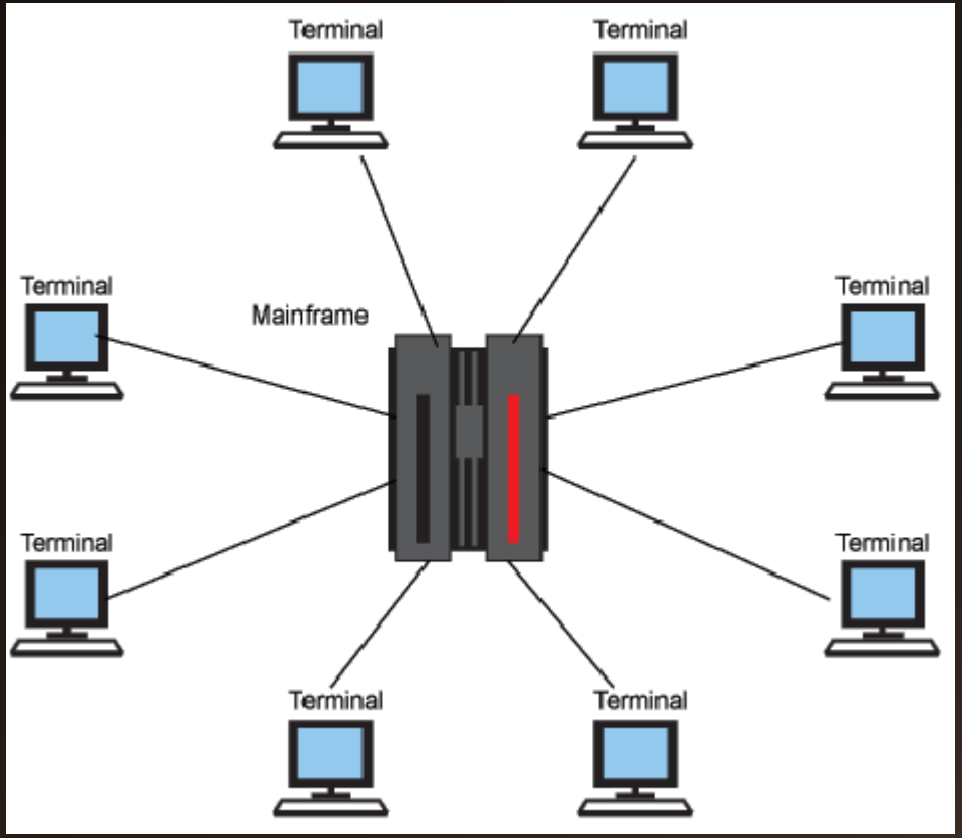
o In this type of operating system, network traffic reduces due to the division between clients and the server.

o This type of system is less expensive to set up and maintain.

Disadvantages of Network Operating System→

o In this type of operating system, the failure of any node in a system affects the whole system.

o Security and performance are important issues. So trained network administrators are required for network administration.



REAL-TIME OPERATING SYSTEM:-

In Real Time Operating Systems, each job carries a certain deadline within which the Job is supposed to be completed, otherwise the huge loss will be there or even if the result is produced then it will be completely useless.

There are two types of Real-Time Operating System→ Hard Real-Time Operating Systems AND Soft Real-Time Operating Systems

Advantages of Real-time operating system:

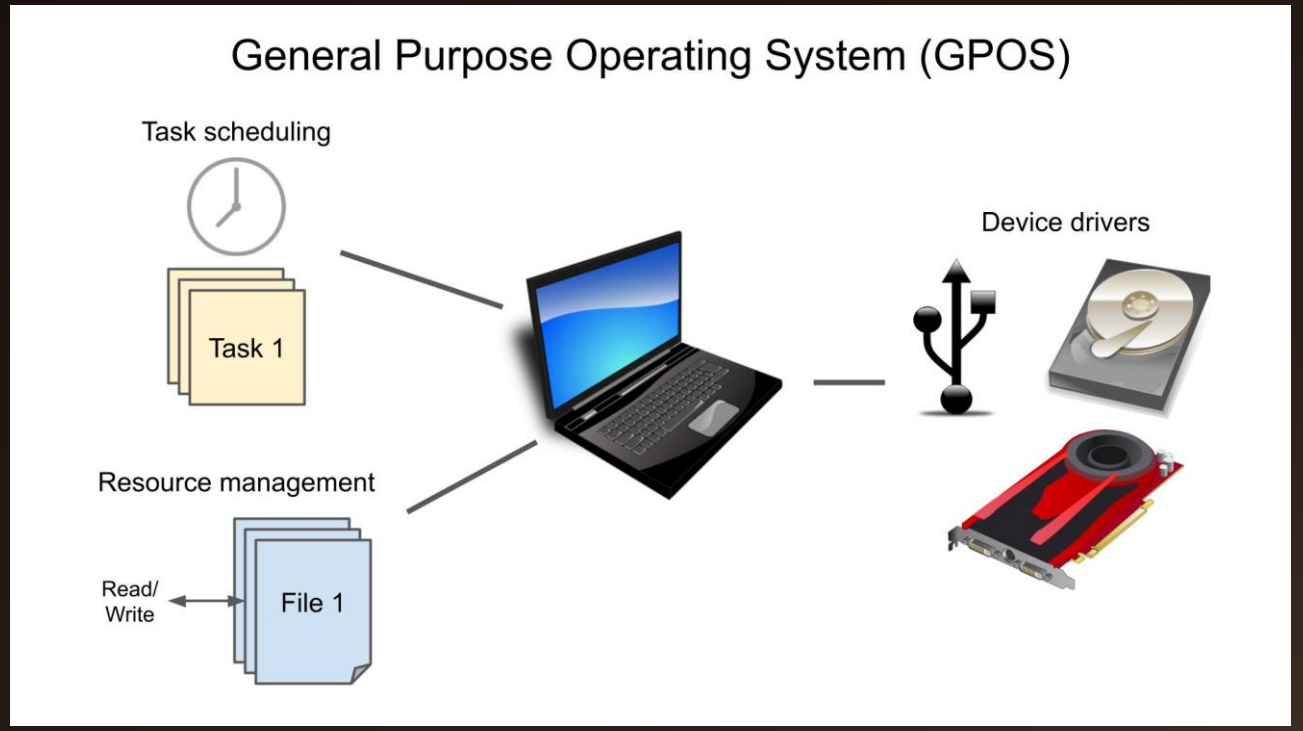
o Easy to layout, develop and execute real-time applications under the real-time operating system.

o In a Real-time operating system, the maximum utilization of devices and systems.

Disadvantages of Real-time operating system:

o Real-time operating systems are very costly to develop.

o Real-time operating systems are very complex and can consume critical CPU cycles.



Thanks