OPERATING SYSTEMS

Course Code: CSE 323

Course Teacher: Rabeya Khatun

Initial: RAK

> *An Operting System is the low-level software that supports a computer's basic functions, such as scheduling tasks and controlling peripherals.*

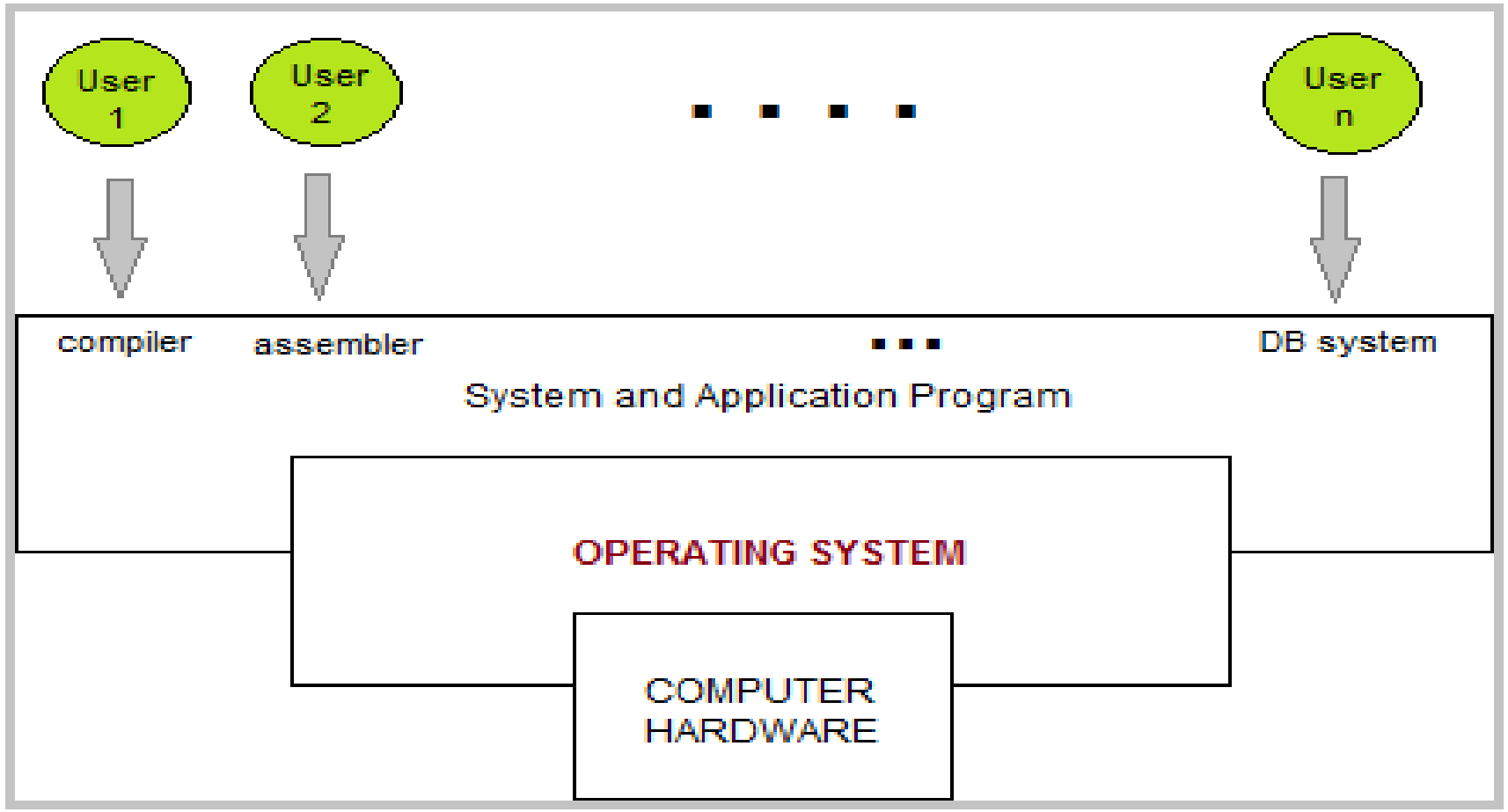
We can refine this definition as follows:

> *An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of programs.*

Following is another definition taken from Wikipedia:

> *An operating system (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs.*

Four Components of a Computer System



Functions of Operating Systems

- Process Management
- I/O Device Management
- File Management
- Network Management
- Main Memory Management
- Secondary Storage Management
- Security Management
- Command Interpreter System
- Control over system performance
- Job Accounting
- Error Detection and Correction
- Coordination between other software and users

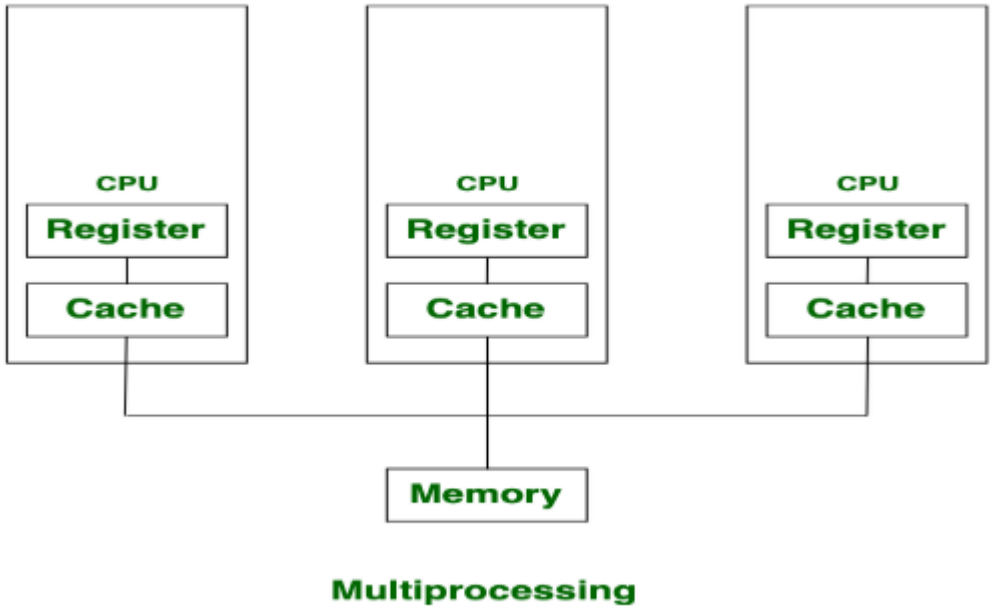
Process Management

A program in running state is called a process.

The operating system is responsible for the following activities in connection with process management:

- ❑ Create, load, execute, suspend, resume, and terminate processes.
- ❑ Switch system among multiple processes in main memory.
- ❑ Provides communication mechanisms so that processes can communicate with each others
- ❑ Provides synchronization mechanisms to control concurrent access to shared data to keep shared data consistent.
- ❑ Allocate/de-allocate resources properly to prevent or avoid deadlock situation.

Multiprocessing Operating System



Multiprocessing

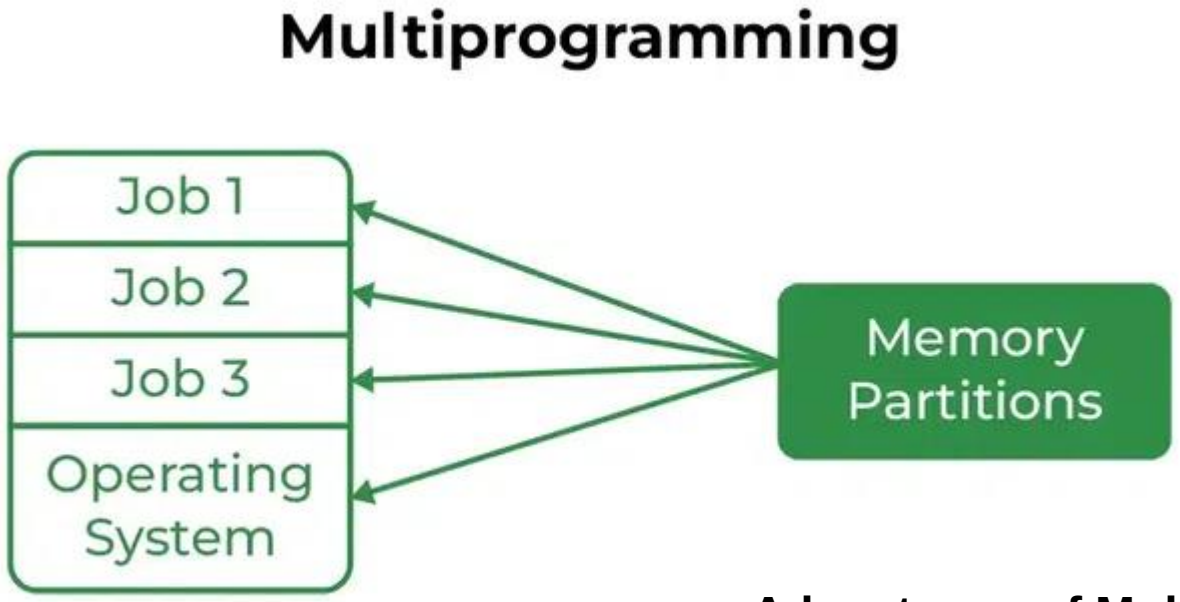
Advantages of Multi-Processing Operating System

- It increases the throughput of the system.
- As it has several processors, so, if one processor fails, we can proceed with another processor.

Disadvantages of Multi-Processing Operating System

- Due to the multiple CPU, it can be more complex and somehow difficult to understand.

Multiprogramming Operating System



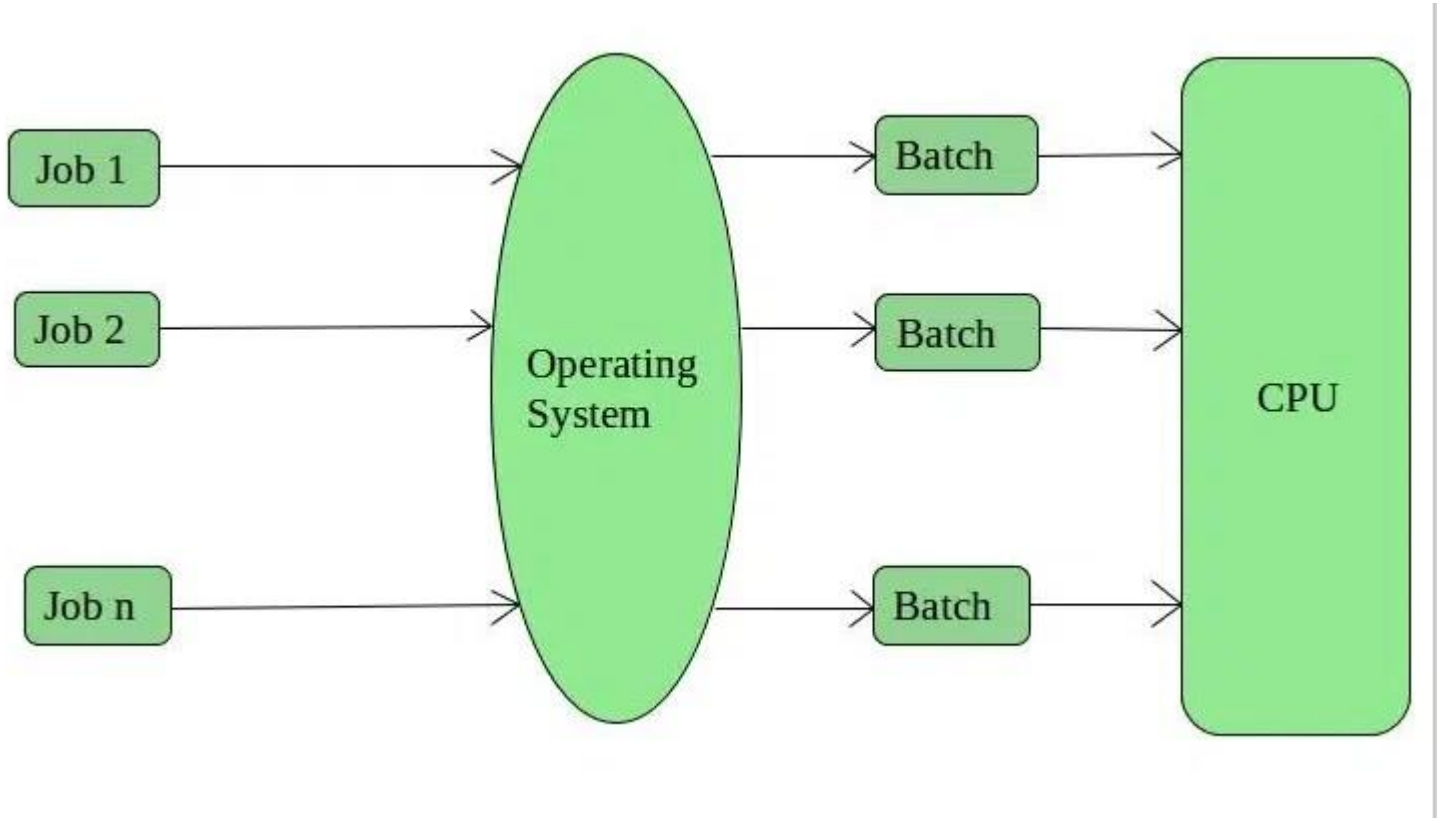
Advantages of Multi-Programming Operating System

•Multi Programming increases the Throughput of the System.
•It helps in reducing the response time.

Disadvantages of Multi-Programming Operating System

•There is not any facility for user interaction of system resources with the system.

Batch Operating System



Batch Operating System

Advantages of Batch Operating System

•Multiple users can share the batch systems.

•The idle time for the batch system is very less.

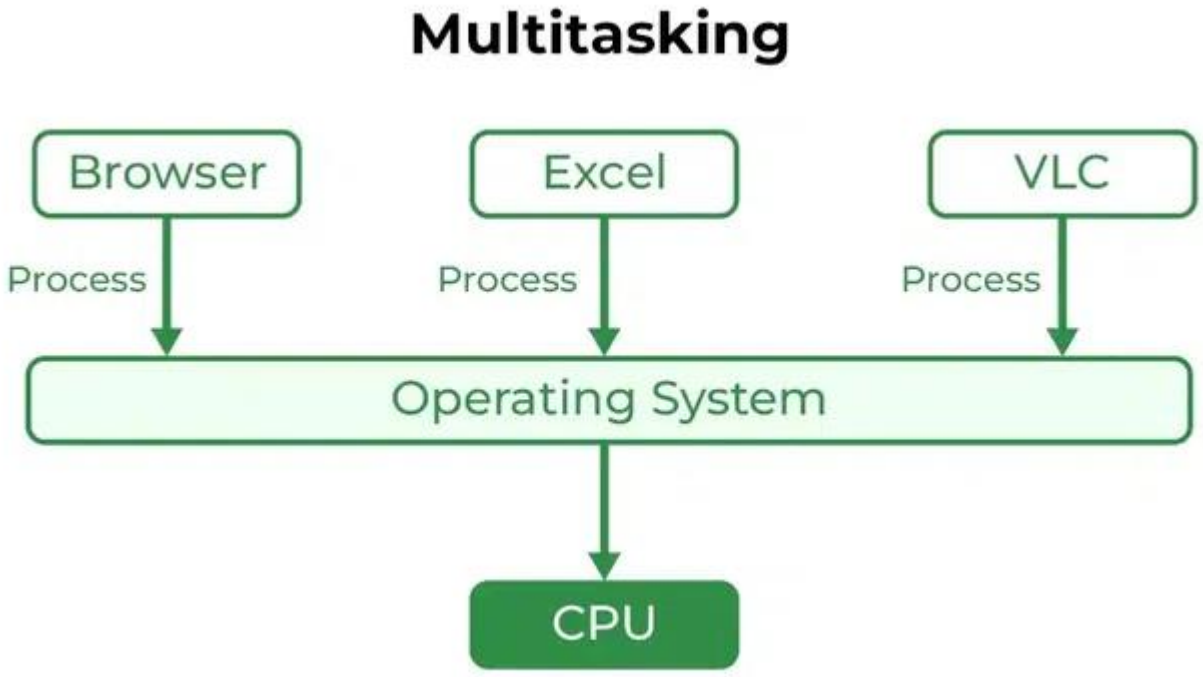
•It is easy to manage large work repeatedly in batch systems.

Disadvantages of Batch Operating System

- The computer operators should be well known with batch systems.
- Batch systems are hard to debug.
- It is sometimes costly.
- The other jobs will have to wait for an unknown time if any job fails.
- In batch operating system the processing time for jobs is commonly difficult to accurately predict while they are in the queue.
- It is difficult to accurately predict the exact time required for a job to complete while it is in the queue.

Multitasking Operating System

Multitasking Operating System is simply a multiprogramming Operating System with having facility of a Round-Robin Scheduling Algorithm. It can run multiple programs simultaneously.



Advantages of Multi-Tasking Operating System

•Multiple Programs can be executed simultaneously in Multi-Tasking Operating System.
•It comes with proper memory management.

Disadvantages of Multi-Tasking Operating System

•The system gets heated in case of heavy programs multiple times.