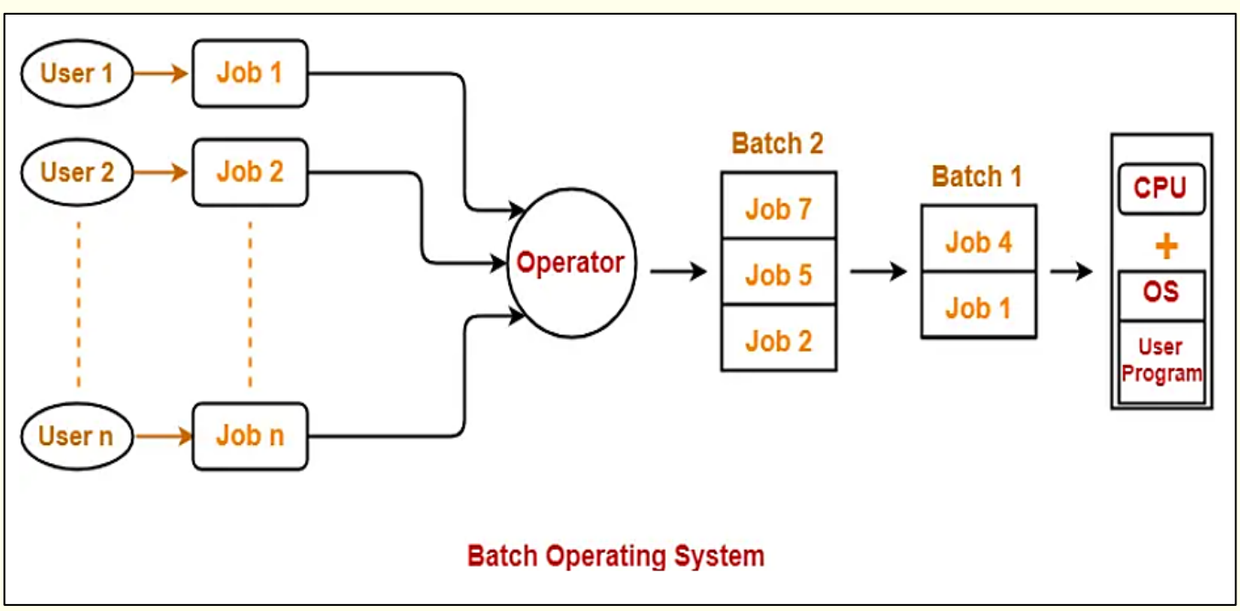
# What are the different types of Operating System?

## Types of Operating System

1. Batch Processing Operating System
2. Multiprogramming Operating System
3. Multitasking Operating System
4. Multiprocessing Operating System
5. Distributed System
6. Real Time OS

### 1. Batch Operating System:

In Batch OS, user prepares his jobs using punch cards and submits to the computer operator. Operator collects the jobs from multiple users and sort the jobs into batches with similar needs. Then operator submits the batches to the processor one by one. All the jobs of one batch are executed together.



Batch Operating System

### Disadvantage:

- Priorities cannot be set, if a job comes with some higher priority.

- May lead to process starvation.
- CPU may become idle in case of I/O operations.

## 2. Multiprogramming Operating System

Multiprogramming operating system allows multiple programs to run concurrently on a computer system.

OS selects job from ready queue and assign to CPU. If one process needs to wait for input/output or other operations, OS selects another job from ready queue and assign to CPU by context switching and keeping CPU busy. It aims to maximize CPU utilization and increase overall system efficiency.

### Advantages

- Multi Programming increases the throughput of the System.
- It helps in reducing the response time.

## 3. Multi-Tasking Operating System

A multitasking operating system is a **logical extension of Multiprogramming OS**. It is a type of operating system that allows multiple tasks or processes to run concurrently **by sharing the CPU time.**

In a multitasking OS, **each task or process is assigned a slice of CPU time, and the operating system switches rapidly between them.** This switching is known as context switching, where the state of one task is saved, and the state of another task is loaded for execution.

The benefits of multitasking include improved system throughput, responsiveness, and efficient utilization of system resources. It allows for concurrent execution of applications, enabling users to run multiple programs simultaneously and switch between them seamlessly.

### 4. Multiprocessing Operating System

A multiprocessing operating system is a type of operating system that allows multiple processors or CPU cores to work together to execute tasks simultaneously. By dividing tasks among multiple processors, it improves the system's performance and speed. It enables parallel processing, where different parts of a task can be done at the same time, leading to faster execution and better utilization of hardware resources.

### 5. Distributed System

A distributed operating system is a type of operating system that enables multiple computers to work together as a single system. It allows the computers to share resources, such as storage, processing power, and memory, and coordinate their activities. The distributed operating system hides the complexities of the underlying network and allows users to access and use these shared resources seamlessly. Distributed operating systems are commonly used in cloud computing, distributed computing, and large-scale networked environments.

## 6. Real Time OS

A Real-Time Operating System (RTOS) is a special type of operating system designed for applications that require tasks to be completed within strict timing requirements. It ensures that critical tasks are executed on time, providing predictable and deterministic behavior. RTOS are used in industries like robotics, aerospace, and medical devices.

### Types of RTOS

**Hard Real-Time Operating Systems**:

These are used in applications where meeting strict timing deadlines is crucial.

**Soft Real-Time Operating Systems:**

These are used in applications where occasional deadline misses are acceptable.