



# *Types of Operating Systems*

# 1. Batch Processing:

- ▶ In Batch processing same type of jobs batch (*BATCH- a set of jobs with similar needs*) together and execute at a time.
- ▶ The OS was simple, its major task was to transfer control from one job to the next.
- ▶ The job was submitted to the computer operator in form of punch cards. At some later time the output appeared.
- ▶ The OS was always resident in memory. (Ref. Fig. next slide)
- ▶ Common Input devices were card readers and tape drives.

# Batch Processing

## (Contd...):

- ▶ Common output devices were line printers, tape drives, and card punches.
- ▶ Users did not interact directly with the computer systems, but he prepared a job (comprising of the program, the data, & some control information).

## 2. Multiprogramming:

- ▶ Multiprogramming is a technique to execute number of programs simultaneously by a single processor.
- ▶ In Multiprogramming, number of processes reside in main memory at a time.
- ▶ The OS picks and begins to executes one of the jobs in the main memory.
- ▶ If any I/O wait happened in a process, then CPU switches from that job to another job.
- ▶ Hence CPU in not idle at any time.

# Multiprogramming (Contd...):

OS
Job 1
Job 2
Job 3
Job 4
Job 5

- Figure depicts the layout of multiprogramming system.
- The main memory consists of 5 jobs at a time, the CPU executes one by one.

## Advantages:

- Efficient memory utilization
- Throughput increases
- CPU is never idle, so performance increases.

# 3. Time Sharing Systems:

- ▶ Time sharing, or multitasking, is a logical extension of multiprogramming.
- ▶ Multiple jobs are executed by switching the CPU between them.
- ▶ In this, the CPU time is shared by different processes, so it is called as “Time sharing Systems”.
- ▶ Time slice is defined by the OS, for sharing CPU time between processes.
- ▶ Examples: Multics, Unix, etc.,

# Another Classification of OS:

Operating System can also be classified as,-

- ▶ **Single User Systems**
- ▶ **Multi User Systems**



# Single User Systems:

- ▶ Provides a platform for only one user at a time.
- ▶ They are popularly associated with Desk Top operating system which run on standalone systems where no user accounts are required.
- ▶ Example: DOS



# Multi-User Systems:

- ▶ Provides regulated access for a number of users by maintaining a database of known users.
- ▶ Refers to computer systems that support two or more simultaneous users.
- ▶ Another term for *multi-user* is *time sharing*.
- ▶ Ex: All mainframes and are multi-user systems.
- ▶ Example: Unix