# Operating Systems (CS3000)

Lecture – 2
(Types of OS)

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Types of OS (Technique Used)

- Old Days
  - Vaccum Tubes with Punch Cards/Paper Tapes
  - Directly Entering Machine Language
  - No OS
  - Slot is Allocated to Each User.
    - Setup the Environment
    - Perform the Task
    - Take the result using print out.
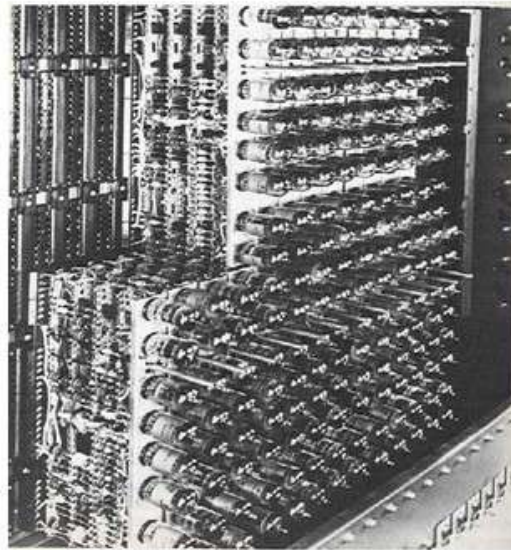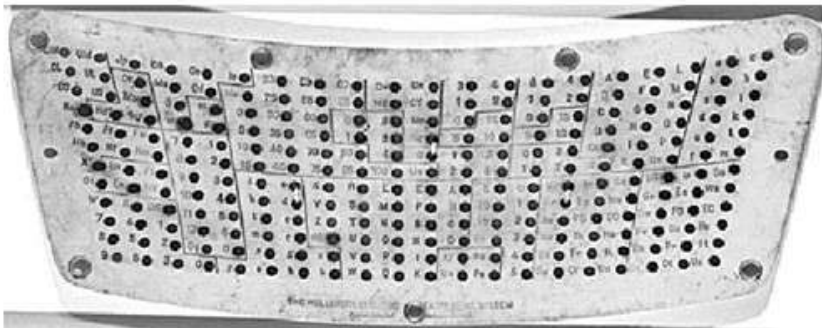
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Types of OS

- ## Batch OS
  - Transistors
  - Assembly Language
  - Starts another job only after the present job is completed entirely
  - both CPU and IO Parts to be over

- Poor CPU Utilization

- Low Throughput (Efficiency Aspect) No of Jobs or Tasks completed per unit time

Every Job or Task has
CPU Time
IO Time

- Stored Program Architecture
- Multiple Programs or Jobs are allowed to be in Main Memory

Types of OS

- ## Multi Programming OS
  - Overlapped execution of CPU and IO Operations Tasks
  - When CPU is idle, switch to other Job
  - Better CPU Utilization – when J1 is busy on IO; J2's CPU part is allowed
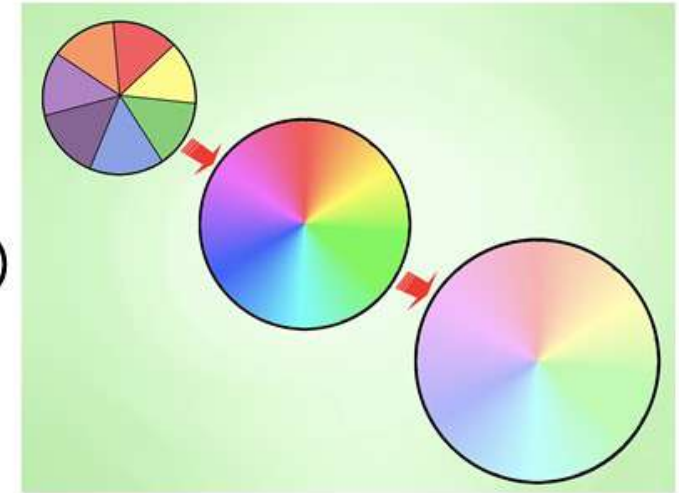   - Betters Throughput

J1 – CPU, IO, CPU
J2 – CPU, IO, CPU

J1-CPU	J2-CPU	J1-CPU	J2-CPU	CPU

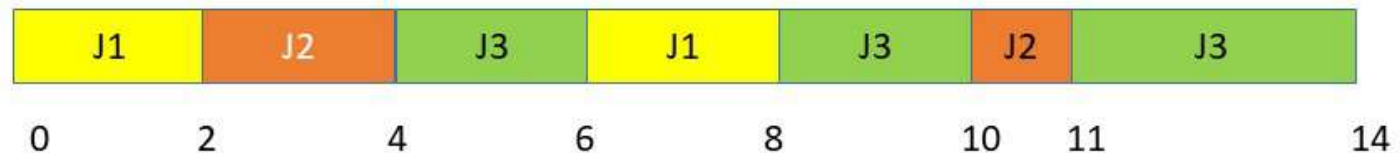J1-IO   J2-IO

- Any Issues??

Types of OS

- ## Multi Tasking OS
  - Based on the concept of Time Sharing (= 2sec)
  - Time Sliced Execution of Tasks
  - Illusion of Simultaneous Execution of Tasks
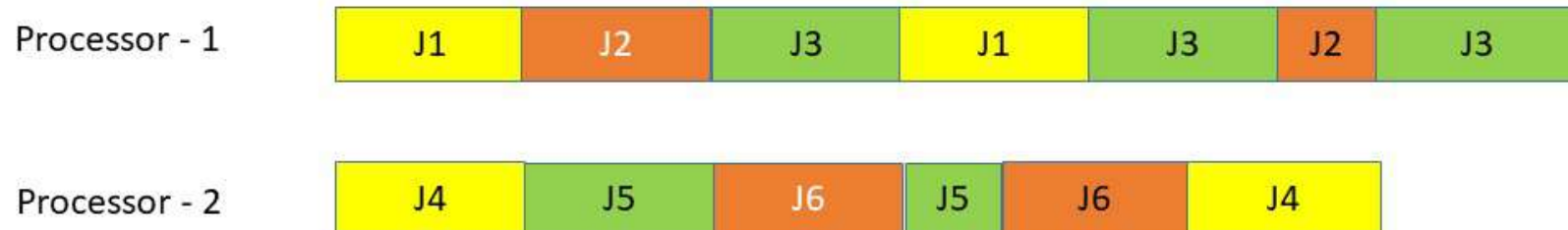
J1 – 4 Sec
J2 – 3 Sec
J3 – 7 Sec

J1	J2	J3	J1	J3	J2	J3

0   2   4   6   8   10   11   14

Types of OS

- ## Multi Processing OS

  - More than 1 Processor
  - Modern day Multicore Systems
  - True Simultaneous or Parallel Processing
  - High Throughput
  - High Reliability – Fault Tolerant Systems
  - Economical – from a user and application management view

| Processor - 1 | J1 | J2 | J3 | J1 | J3 | J2 | J3 |

| Processor - 2 | J4 | J5 | J6 | J5 | J6 | J4 |

Thank You

Any Questions?