First Come First Served (FCFS)

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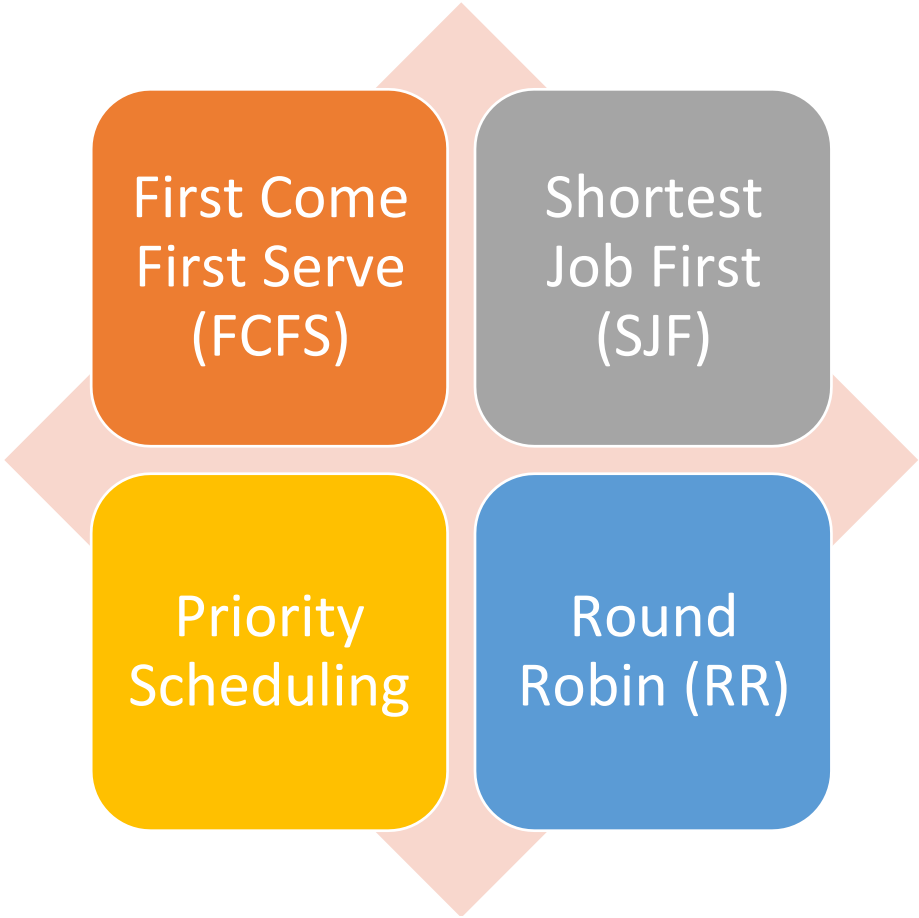
CPU Scheduling Algorithms



First-Come, First-Served (FCFS) Scheduling

- The job that arrives first is scheduled first (Single FIFO ready queue)
- No-preemptive
  - Not suitable for timesharing systems
- Simple to implement and understand
- Average waiting time dependent on the order processes enter the system

First-Come, First-Served (FCFS) Scheduling

- Consider processes arrive at time 0

Turnaround Time = Completion Time – Arrival Time

Process	Burst Time
P_1	24
P_2	3
P_3	3

- Suppose that the processes arrive in the order: P_1 , P_2 , P_3
- The *Gantt Chart* for the schedule:

- Turnaround Time P_1 = 24; P_2 = 27; P_3 = 30
- Average turnaround time: (24+27+30)/3 = 27ms

First-Come, First-Served (FCFS) Scheduling

- Consider processes arrive at time 0

Waiting Time = Turnaround Time – Burst Time

Process	Burst Time
P_1	24
P_2	3
P_3	3

- Suppose that the processes arrive in the order: P_1 , P_2 ,
- The *Gantt Chart* for the schedule:

- Turnaround Time P_1 = 24; P_2 = 27; P_3 = 30
- Waiting time for P_1 = 0; P_2 = 24; P_3 = 27
- Average waiting time: (0+24+27)/3 = 17ms

FCFS Scheduling (Cont.)

Process	Burst Time
P_1	24
P_2	3
P_3	3

- Suppose that the processes arrive in the order P_2 , P_3 , P_1

Turnaround Time = Completion Time – Arrival Time

- The Gantt chart for the schedule:

- Turnaround Time for $P_1 = 30$; $P_2 = 3$; $P_3 = 6$
- Average Turnaround time: (30+3+6)/3 = 13ms
- *Problems:*
  - *Convoy effect* (short processes behind long processes)
  - Non-preemptive -- not suitable for time-sharing systems

FCFS Scheduling (Cont.)

Process	Burst Time
P_1	24
P_2	3
P_3	3

- Suppose that the processes arrive in the order P_2 , P_3 ,

Waiting Time = Turnaround Time – Burst Time

- The Gantt chart for the schedule:

- Turnaround Time for $P_1 = 30$; $P_2 = 3$; $P_3 = 6$
- Waiting time for $P_1 = 6$; $P_2 = 0$; $P_3 = 3$
- Average waiting time: (30+3+6)/3 = 13ms

FCFS Scheduling (Cont.)

- *Problems:*
  - *Convoy effect* (short processes behind long processes)
  - Non-preemptive -- not suitable for time-sharing systems

Example 2 FCFS

- Consider the set of 5 processes whose arrival time and burst time are given below. Calculate the average waiting time and average turnaround time

Process ID	Arrival Time	Burst Time
P1	4	5
P2	6	4
P3	0	3
P4	6	2
P5	5	4

Question ?