

Slide 6 Exercises

1). Consider the following set of processes with their *arrival time*, *CPU burst time*, and *priority* details:

Process	Arrival Time (ms)	Burst (ms)	Priority
P_1	0	8	3
P_2	1	9	1
P_3	2	7	2
P_4	3	3	5
P_5	4	12	4

Draw the *Gantt chart* and show the *average waiting time* for the execution of these processes using the following scheduling algorithms:

1.1) First-Come First-Served (FCFS)

1.2) Shortest-Job-First (SJF)

1.3) Priority

1.4) Round-Robin (RR) (time quantum = 4).

2). Consider the following set of processes with their *arrival time*, *CPU burst time* and *priority* details:

Process	Arrival Time (ms)	CPU Burst (ms)	Priority
P_1	0	6	4
P_2	1	3	1
P_3	2	10	2
P_4	3	8	3

Draw the *Gantt chart*, and show the *average waiting time* of the processes based on the following scheduling algorithms:

2.1) First-Come First-Served (FCFS)

2.2) Shortest-Job-First (SJF)

2.3) Priority

2.4) Round-Robin (time quantum = 4).

3). Consider the following set of processes with their *arrival time*, *CPU burst time* and *priority* details:

Process	Arrival Time (ms)	CPU Burst (ms)	Priority
P_1	0	11	1
P_2	1	4	3
P_3	2	8	4
P_4	3	24	2

Draw the *Gantt chart*, and show the *average waiting time* of the processes based on the following scheduling algorithms:

3.1) First-Come First-Served (FCFS)

3.2) Shortest-Job-First (SJF)

3.3) Priority

3.4) Round-Robin (time quantum = 4).

4). A CPU-scheduling algorithm determines an order for the execution of its scheduled processes. Given n processes to be scheduled on one processor, how many different schedules are possible?

5). Explain the difference between preemptive and non-preemptive scheduling.

6). Assume that an operating system maps user-level threads to the kernel using the many-to-many model and that the mapping is done through the use of LWPs. Furthermore, the system allows program developers to create real-time threads. Is it necessary to bind a real-time thread to an LWP?

7). Why is it important for the scheduler to distinguish I/O-bound programs from CPU-bound programs?