

Test Problems

3.1 Suppose the following jobs arrive for processing at the times indicated, each job will run the listed amount of time.

Jobs	Arrival tie	Burst time (in secs.)
1	0.0	8
2	0.4	4
3	1.0	1

Give Gantt charts illustrating the execution of these jobs using the non preemptive FCFS and SJF scheduling algorithms. Compute the average turn around time and average waiting time of each job for above algorithms.

3.2 Given the following information about jobs:

Job	Time	Arrival	Priority
1	8	0	3
2	4	0	2
3	6	0	1
4	1	0	4

All jobs arrive at time 0 (but in the order 1, 2, 3 & 4). Draw charts and calculate the average time to complete (turn-around time) using the following scheduling algorithms: FCFS, SJF, Priority scheduling and round Robin ($t=2$)

3.3 Suppose we have a single processor system, and jobs arrive at a rate of 10 jobs a Seconds, suppose each job takes an average of 50 milli seconds to complete. Assure that both distributions are exponential. What is the expected number of jobs in the system and the average time in the system?

3.4 For the following set of processes:

Process	Burst Time	Priority
P ₁	5	5
P ₂	3	4

P ₃	8	3
P ₄	2	1
P ₅	1	2

The processes have arrived in the order P₂, P₁, P₄, P₃ and P₅. Obtain the Gantt chart and waiting time for the following types of scheduling.

3.5 Consider system with five processor P₀ to P₄ and 3 resources A, B and C, Resources type A has 10 instances, B has 5 instances and C has 7 instances.

The snapshot at time T₀ is

ALLOTTED				MAX			
	A	B	C		A	B	C
P ₀	0	1	0		7	5	3
P ₁	2	0	0		3	2	2
P ₂	3	0	2		9	0	2
P ₃	2	1	1		2	2	2
P ₄	0	0	2		4	3	3

Now the process P₁ request one additional resource type A and two instances of C. Determine whether this new state is safe or not.

3.6 Jobs A, B, C, D and E with running time of 10, 7, 2, 6 and 8 respectively arrive at a computer in the time order 0, 2, 5, 7, and 9. If the priority of these jobs is in the order C, B, E, A, D and the time slice is 3 units of time. Compute the time required to execute jobs A through E with the following assumptions.

- The context switching takes 1 time unit.
- None of the jobs require IO.
- we follow a policy that a higher priority jobs always succeeds in preempting

3.7

Process Number	Time to completion	Time of arrival
1	40	0
2	30	5

3	15	25
4	25	50
5	20	70

- Create the Gantt chart for FCFS Scheduling and compute the turnaround time for Process 3.
- Create Gantt chart for Shortest Remaining time.

What is the difference between the average times for FCFS and Shortest Remaining time?

3.8 Suppose we have two resident processes P_1 and P_2 with the following burst time observed during the last four CPU allocations

P_1

3	3	4	4
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P_2

5	7	4	4
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Using an exponential averaging technique predict the next burst time for P_1 and P_2 .