

CSE 210 - OPERATING SYSTEM

ASSIGNMENT

Solve all the questions.

1. Following is the snapshot of a CPU:

Process	CPU Burst	Arrival Time
P1	75	0
P2	40	10
P3	25	10
P4	20	80
P5	45	85

Draw the Gantt chart and compute the avg. turnaround time and avg. waiting time for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum 15) scheduling algorithms.

2. Consider a system with four processes P1, P2, P3, and P4, and two resources, R1, and R2, respectively.

Each resource has two instances. Furthermore:

- P1 allocates an instance of R2, and requests an instance of R1;
- P2 allocates an instance of R1, and doesn't need any other resource;

- P3 allocates an instance of R1 and requires an instance of R2; - P4 allocates an instance of R2, and doesn't need any other resource.

(a) Draw the resource allocation graph.

(b) Is there a cycle in the graph? If yes name it.

(c) Is the system in deadlock? If yes, explain why. If not, give a possible sequence of executions after which every process completes.

3. A system has 5 processes and 4 resource types. The current allocation and maximum demand are as follows-

Process	Max	Allocation	Available
Resources	A, B, C, D	A, B, C, D	A, B, C, D
P0	6 0 1 2	4 0 0 1	3 2 1 1
P1	2 7 5 0	1 1 0 0	
P2	2 3 5 6	1 2 5 4	
P3	1 6 5 3	0 6 3 3	
P4	1 6 5 6	0 2 1 2	

Using Banker's algorithm, answer the following questions:-

i) How many resources of type A, B, C, D are there?

ii) What are the contents of need matrix?

iii) Find if the system is in safe state? If it is, find the safe sequence.

4. Consider the following snapshot of the system.

Process	Allocation	Max	Available
Resources	A, B, C, D	A, B, C, D	A, B, C, D
P0	2 0 0 1	4 2 1 2	3 3 2 1
P1	3 1 2 1	5 2 5 2	
P2	2 1 0 3	2 3 1 6	
P3	1 3 1 2	1 4 2 4	
P4	1 4 3 2	3 6 6 5	

Answer the following questions using Banker's algorithm.

a. Determine the need matrix.

b. Illustrate that the system is in a safe state by demonstrating the order in which the processes may complete

c. If a request from process P1 arrives for (1,1,0,0), can the request be granted immediately d. If a request from process P1 arrives for (0,0,2,0), can the request be granted immediately.

5. Memory partitions of 100kb, 500 kb, 200 kb, 300kb, 600 kb are available how would best, worst, first fit algorithm to place processes 212,417,112,426 in order. Show which is the best algorithm?