TKM College of Engineering
Department of Computer Science & Engineering
22CST404: OPERATING SYSTEMS

TUTORIAL 2

1. Consider a system with four processes Pl, P2, P3, P4, and four t5rpes of resources Rl, R2, R3, R4. The maximum no: of instances of resources of each type are 5, 7, 7 and 7 respectively. What will be the order of processing of jobs if the allocated matrix and the maximum claim (that each process can claim) matrix are as given below.

	Allocated Matrix				Maximum Claim			
	R1	R2	R3	R4	R1	R2	R3	R4
P1	2	1	3	2	3	5	6	4
P2	0	0	1	2	1	3	4	6
P3	1	2	1	1	1	4	3	2
P4	1	1	0	2	2	3	1	2

2. Consider the following snapshot of a system with five processes pl, p2, p3, p4, p5 and four resources A, B, C, D. Using Banker's Algorithm, find the following

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

   ii) Calculate the Need Matrix.

   iii) Is system is safe state? If yes, find the safe sequence?

   iv) If the request from P2 arrives for (0,3,2,0), Can the request be immediately granted?

Process	**Allocation**				**Max**				**Available**			
	A	**B**	**C**	**D**	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
P1	0	0	1	2	0	0	1	2	1	5	2	0
P2	1	0	0	0	1	7	5	0				
P3	1	3	5	4	2	3	5	6				
P4	0	6	3	2	0	6	5	2				
P5	0	0	1	4	0	6	5	6				

3. Give memory partition of 100k, 500k, 200k, 300k and 600k (in order). How would each of the first fit, best fit and worst fit algorithm place process of size 212k, 417k, 112k, and 426 k (in order)?

4. Consider the following segment table

Segment	Base Address	Length
0	100	400
1	3700	300
2	700	600
3	2600	500
4	1500	1000

   What are the physical addresses for the following logical addresses?

   (i) 4, 350 (ii) 2, 100 (iii) 3, 70 (iv) 0, 25

5. Consider the following page reference string:

   7,2,3,1,2,5,3,4,6,7,7,1,0,5,4,6,2,3,0,1.

   Assuming demand paging with three frames, how many page faults would occur for the following page replacement algorithms.

   i) LRU replacement ii) FIFO replacement iii) Optimal replacement

6. Assume that a magnetic disk has 400 cylinders (numbered 0 to 399). The current position of the head is at cylinder 120. The request queue is 80, 130, 60, 230, 100, 300, 250, and 170. Draw the head movement in each of the following disk scheduling algorithms and compute the total head movement in each case:

   (i) SSTF (ii) SCAN (iii) LOOK