Roll No. 66

Operating System Tutorial-6

Deadlock avoidance Banking Algorithm

Q1. Using the banker's algorithm, answer the following questions.

Process	Max				Allocation				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	6	0	1	2	4	0	0	1	3	2	1	1
P_1	2	7	5	0	1	1	0	0				
P_2	2	3	5	6	1	2	5	4				
P_3	1	6	5	3	0	6	3	3				
P_4	1	6	5	6	0	2	1	2				
Total					6	11	9	10				

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

ii) What is the content of need matrix?

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

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Process	Allocation				Max				(Avail + rel) Available				(max − Allocation) Remaining Need				
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
P_0	4	0	0	1	6	0	1	2	3	2	1	1	2	0	1	1	✓ 1st
P_1	1	1	0	0	2	7	5	0	7	~~2~~	~~7~~	2	1	6	5	0	✓ 5th
P_2	1	2	5	4	2	3	5	6	8	~~4~~	~~5~~	6	1	1	0	2	✓ 2nd
P_3	0	6	3	3	1	6	5	3	8	10	~~8~~ 9	9	1	0	2	0	✓ 3rd
P_4	0	2	1	2	1	6	5	6	8	~~12~~ 10	10	11	1	4	4	4	✓ 4th
Total	6	11	9	10					9	13	10	11					

Available resource = Total resources − Total allocation

∴ Total Resources = Available R. + Total Allocation

= [3 2 1 1] + [6 11 9 10]

Total Resources = [9 13 10 11]

Safe Sequence = { P_0, P_2, P_3, P_4, P_1 } and system allocates all the needed resources to each process So, we can say that the system is in a safe state

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