015BL2150414
Prateek Desai

Assignment - 02

* Consider a system that contains 5 processes P3, P4, P5, & 3 resource type A, B, & C foll are the resources types. A has 10, B has the type C has 7 instance.

Process	Allocation			Max			Availa	
	A	B	C	A	B	C	A	B
P1	0	1	0	7	5	3	3	3
P2	2	0	0	3	2	2		
P3	3	0	2	9	0	2		
P4	2	1	1	2	2	2		
P5	0	0	2	4	3	3		

Answer the following question.

i) What is the reference of the need matrix?

→ Contaext of the need matrix is as follows

Need [i] = Max [i] - Allocation [i]
Need for P1 : (7, 5, 3) - (0, 1, 0) = 7, 4, 3
Need for P2 : (3, 2, 2) - (2, 0, 0) = 1, 2, 2
Need for P3 : (9, 0, 2) - (3, 0, 2) = 6, 0, 0
Needs for P4 : (2, 2, 2) - (2, 1, 1) = 0, 1, 1
Needs for P5 : (4, 3, 3) - (0, 0, 2) = 4, 3, 1

Process	Need		
	A	B	C
P_1	7	4	3
P_2	1	2	2
P_3	6	0	0
P_4	0	1	1
P_5	4	3	1

2) Determine if the system is safe or not

→ Apply the Banker's Algorithm.

Available resource of A, B & C are 3, 3, & 2

step 1: For Process P_1
Need <= Available
7, 4, 3 <= 3, 3, 2 Condition is false

step 2 For Process P_2
Need <= Available
1, 2, 2 <= 3, 3, 2 cond' true
New available = available + allocation
3, 3, 2 + 2,0,0 ⇒ 5,3,2

step 3 For Process P_4
Need <= Available
6, 0, 0 <= 5,3,3 cond' false

step. 4 :   § For P_4

Need <= Available

0, 1, 1 <= 5, 3, 2   cond True

New available = available + allocation

5, 3, 2 + 2, 1, 1 = 7, 4, 3

step 5 : For P_5

Need <= Available

4, 3, 1 <= 7, 4, 3   cond True.

New available = available + allocation

7, 4, 3, + 0, 0, 2 = 7, 4, 5

Now we again examine each type of resource
request for , P_1 & P_3

step 6 : For Process P_1

Need <= Available

7, 4, 3 .<= 7, 4, 5   cond True

New available = available + allocation

7, 4, 5 + 0, 1 0 = 7, 5, 5

step 7 : For Process P_3

New <= Available.

6, 0, 0 <= 7, 5 5   cond True.

New available = available + allocation

7, 5, 5 + 3, 0, 2 = 10, 5, 7

Hence, we execute the Banker's algorithm to find the safe state a safe sequence like P_2, P_4, P_5, P_1, P_3.

3) What will happen if the resource request $(1, 0, 0)$ for process P_1 can the system accept this request immediately

=) For granting the request $(1, 0, 2)$, first we need to check that request <= Available i.e $(1, 0, 2)$ <= $(3, 3, 2$ since the condition is true

So process P_1 gets the request immediately.