INSTITUTE OF TECHNOLOGY, NIRMA UNIVERSITY

2CS403 OPERATING SYSTEMS

INNOVATIVE ASSIGNMENT

Banker's Algorithm Simulation

Input data –

Max Resource instance	
A	3
B	14
C	12
D	12

Process Name	Allocated A	B	C	D
P1	0	0	1	2
P2	1	0	0	0
P3	1	3	5	4
P4	0	6	3	2
P5	0	0	1	4

Process Name	Maximum A	B	C	D
P1	0	0	1	2
P2	1	7	5	0
P3	2	3	5	6
P4	0	6	5	2
P5	0	6	5	6

Resource Request : P2 → (0, 4, 2, 0)

Output Screenshots –

Need Table

Resource / Process	A	B	C	D
Process 1	0	0	0	0
Process 2	0	7	5	0
Process 3	1	0	0	2
Process 4	0	0	2	0
Process 5	0	6	4	2

Create All Tables

Find need | Find available

Find Safe Sequence

Make a Resource Request

Check Safe state

Reset

Need (Process 1) = Max (0,0,1,2) - Allocation (0,0,1,2) = (0,0,0,0)

Need (Process 2) = Max (1,7,5,0) - Allocation (1,0,0,0) = (0,7,5,0)

Need (Process 3) = Max (2,3,5,6) - Allocation (1,3,5,4) = (1,0,0,2)

Need (Process 4) = Max (0,6,5,2) - Allocation (0,6,3,2) = (0,0,2,0)

Need (Process 5) = Max (0,6,5,6) - Allocation (0,0,1,4) = (0,6,4,2)

Available Table

Resource A	1
Resource B	5
Resource C	2
Resource D	0

Create All Tables

Find need | Find available

Find Safe Sequence

Make a Resource Request

Check Safe state

Reset

Available (Resource A) = Total (3) - Total allocated (0 + 1 + 1 + 0 + 0) = 1

Available (Resource B) = Total (14) - Total allocated (0 + 0 + 3 + 6 + 0) = 5

Available (Resource C) = Total (12) - Total allocated (1 + 0 + 5 + 3 + 1) = 2

Available (Resource D) = Total (12) - Total allocated (2 + 0 + 4 + 2 + 4) = 0

Safe Sequence

Find need | Find available

Find Safe Sequence

Make a Resource Request

Check Safe state

Reset

1	3	4	5	2

Process 1 : Need (0,0,0,0) <= Available (1,5,2,0) -> New Available (1,5,3,2)

Process 3 : Need (1,0,0,2) <= Available (1,5,3,2) -> New Available (2,8,8,6)

Process 4 : Need (0,0,2,0) <= Available (2,8,8,6) -> New Available (2,14,11,8)

Process 5 : Need (0,6,4,2) <= Available (2,14,11,8) -> New Available (2,14,12,12)

Process 2 : Need (0,7,5,0) <= Available (2,14,12,12) -> New Available (3,14,12,12)

FIND NEED FIND AVAILABLE

RESOURCE REQUEST

FIND SAFE SEQUENCE

Enter process number that wants to make request : 2

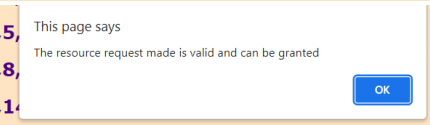
MAKE A RESOURCE REQUEST

Resource Request Table

CHECK SAFE STATE

Resource A	0
Resource B	4
Resource C	2
Resource D	0

RESET



Process 3 : Need (1,0,0,2) <= Available (1,5,

Process 4 : Need (0,0,2,0) <= Available (2,8,

Process 5 : Need (0,6,4,2) <= Available (2,1

Process 2 : Need (0,7,5,0) <= Available (2,14,12,12) -> New Available (3,14,12,12)

CREATE ALL TABLES

FIND NEED FIND AVAILABLE

RESOURCE REQUEST

FIND SAFE SEQUENCE

Enter process number that wants to make request : 2

MAKE A RESOURCE REQUEST

Resource Request Table

CHECK SAFE STATE

Resource A	0
Resource B	4
Resource C	2
Resource D	0

RESET

Safe Sequence

CHECK SAFE STATE

1	3	4	5	2

RESET

Process 1 : Need (0,0,0,0) <= Available (1,1,0,0) -> New Available (1,1,1,2)

Process 3 : Need (1,0,0,2) <= Available (1,1,1,2) -> New Available (2,4,6,6)

Process 4 : Need (0,0,2,0) <= Available (2,4,6,6) -> New Available (2,10,9,8)

Process 5 : Need (0,6,4,2) <= Available (2,10,9,8) -> New Available (2,10,10,12)

Process 2 : Need (0,3,3,0) <= Available (2,10,10,12) -> New Available (3,14,12,12)