

**Operating System Lab
CS342**

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Lab:8

1901CS63

Q1 Write a Program to Implement Bankers algorithm.

(a) Given allocated, max and available resources (should be taken as input from user) for n number of process The code should print if there is any safe sequence available.

(b) For the above problem, print all the different safe sequences possible.

Compilation:

g++ -q1.cpp -o q1

Syntax:

./q1

Number of processes

Number of resources

Available resources array

Allocated resources matrix

Max resources matrix

Sample Input and Output:

Input:

5 --- Number of processes

3 --- Number of resources

3 3 2 --- Available resources array

0 1 0 --- Allocated resources matrix

2 0 0

3 0 2

2 1 1

0 0 2

7 5 3 --- Max resources matrix

3 2 2

9 0 2

2 2 2

4 3 3

Output:

```
chiku@DESKTOP-5JCAMRU: /mnt/d/tanishq/3rd year/6th sem/os_lab/lab-8$ g++ q1.cpp -o q1
chiku@DESKTOP-5JCAMRU: /mnt/d/tanishq/3rd year/6th sem/os_lab/lab-8$ ./q1
Enter the no of process: 5
Enter the no of resources: 3
Enter the available resources:
3 3 2
Enter the allocation matrix:
0 1 0
2 0 0
3 0 2
2 1 1
0 0 2
Enter the MAX matrix:
7 5 3
3 2 2
9 0 2
2 2 2
4 3 3
Safe sequence 1: 1 -> 3 -> 0 -> 2 -> 4
Safe sequence 2: 1 -> 3 -> 0 -> 4 -> 2
Safe sequence 3: 1 -> 3 -> 2 -> 0 -> 4
Safe sequence 4: 1 -> 3 -> 2 -> 4 -> 0
Safe sequence 5: 1 -> 3 -> 4 -> 0 -> 2
Safe sequence 6: 1 -> 3 -> 4 -> 2 -> 0
Safe sequence 7: 1 -> 4 -> 3 -> 0 -> 2
Safe sequence 8: 1 -> 4 -> 3 -> 2 -> 0
Safe sequence 9: 3 -> 1 -> 0 -> 2 -> 4
Safe sequence 10: 3 -> 1 -> 0 -> 4 -> 2
Safe sequence 11: 3 -> 1 -> 2 -> 0 -> 4
Safe sequence 12: 3 -> 1 -> 2 -> 4 -> 0
Safe sequence 13: 3 -> 1 -> 4 -> 0 -> 2
Safe sequence 14: 3 -> 1 -> 4 -> 2 -> 0
Safe sequence 15: 3 -> 4 -> 1 -> 0 -> 2
Safe sequence 16: 3 -> 4 -> 1 -> 2 -> 0
chiku@DESKTOP-5JCAMRU: /mnt/d/tanishq/3rd year/6th sem/os_lab/lab-8$
```

Safe sequence 1: 1 -> 3 -> 0 -> 2 -> 4
Safe sequence 2: 1 -> 3 -> 0 -> 4 -> 2
Safe sequence 3: 1 -> 3 -> 2 -> 0 -> 4
Safe sequence 4: 1 -> 3 -> 2 -> 4 -> 0
Safe sequence 5: 1 -> 3 -> 4 -> 0 -> 2
Safe sequence 6: 1 -> 3 -> 4 -> 2 -> 0
Safe sequence 7: 1 -> 4 -> 3 -> 0 -> 2
Safe sequence 8: 1 -> 4 -> 3 -> 2 -> 0
Safe sequence 9: 3 -> 1 -> 0 -> 2 -> 4
Safe sequence 10: 3 -> 1 -> 0 -> 4 -> 2
Safe sequence 11: 3 -> 1 -> 2 -> 0 -> 4
Safe sequence 12: 3 -> 1 -> 2 -> 4 -> 0
Safe sequence 13: 3 -> 1 -> 4 -> 0 -> 2
Safe sequence 14: 3 -> 1 -> 4 -> 2 -> 0
Safe sequence 15: 3 -> 4 -> 1 -> 0 -> 2
Safe sequence 16: 3 -> 4 -> 1 -> 2 -> 0

Input:

5 --- Number of processes

3 --- Number of resources

2 1 0 --- Available resources array

1 1 2 --- Allocated resources matrix

2 1 2

4 0 1

0 2 0

1 1 2

4 3 3 --- Max resources matrix

3 2 2

9 0 2

7 5 3

1 1 2

```
chiku@DESKTOP-5JCAMRU: /m  X + -
Safe sequence 16: 3 -> 4 -> 1 -> 2 -> 0
chiku@DESKTOP-5JCAMRU:/mnt/d/tanishq/3rd year/6th sem/os_lab/lab-8$ ./q1
Enter the no of process: 5
Enter the no of resources: 3
Enter the available resources:
2 1 0
Enter the allocation matrix:
1 1 2
2 1 2
4 0 1
0 2 0
1 1 2
Enter the MAX matrix:
4 3 3
3 2 2
9 0 2
7 5 3
1 1 2
Safe sequence 1: 1 -> 0 -> 2 -> 3 -> 4
Safe sequence 2: 1 -> 0 -> 2 -> 4 -> 3
Safe sequence 3: 1 -> 0 -> 4 -> 2 -> 3
Safe sequence 4: 1 -> 4 -> 0 -> 2 -> 3
Safe sequence 5: 1 -> 4 -> 2 -> 0 -> 3
Safe sequence 6: 1 -> 4 -> 2 -> 3 -> 0
Safe sequence 7: 4 -> 0 -> 1 -> 2 -> 3
Safe sequence 8: 4 -> 1 -> 0 -> 2 -> 3
Safe sequence 9: 4 -> 1 -> 2 -> 0 -> 3
Safe sequence 10: 4 -> 1 -> 2 -> 3 -> 0
chiku@DESKTOP-5JCAMRU:/mnt/d/tanishq/3rd year/6th sem/os_lab/lab-8$ |
```

Input:

2 --- Number of processes

3 --- Number of resources

1 1 1 --- Available resources array

1 0 0 --- Allocated resources matrix

0 2 1

1 2 3 --- Max resources matrix

2 2 2

```
chiku@DESKTOP-5JCAMRU:/mnt/d/tanishq/3rd_year/6th_sem/os_lab/lab-8$ ./q1
Enter the no of process: 2
Enter the no of resources: 3
Enter the available resources:
1 1 1
Enter the allocation matrix:
1 0 0
0 2 1
Enter the MAX matrix:
1 2 3
2 2 2

There are no safe-sequences!
chiku@DESKTOP-5JCAMRU:/mnt/d/tanishq/3rd_year/6th_sem/os_lab/lab-8$ |
```

----- The End -----