

```

import java.util.Scanner;

public class _14_deadlock {

    public static void main(String[] args) {

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter number of process :-");

        int process=sc.nextInt();

        System.out.println("Enter number of resources :-");

        int resources=sc.nextInt();


        int [][]max=new int[process][resources];

        int [][]allocation=new int[process][resources];

        int []available=new int[resources];

        int [][]need=new int [process][resources];

        int []processFlag= new int[process];


        for (int i = 0; i < process; i++) {

            for (int j = 0; j < resources; j++) {

                System.out.println("Enter max values ["+i+"] ["+j+"] :- ");

                max[i][j]= sc.nextInt();

            }

        }


        for (int i = 0; i < process; i++) {

            for (int j = 0; j < resources; j++) {

                System.out.println("Enter allocation ["+i+"] ["+j+"]:- ");

                allocation[i][j]=sc.nextInt();

            }

        }
    }
}

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for (int j = 0; j < resources; j++) {  
    System.out.println("Enter available ["+j+":- ");  
    available[j]=sc.nextInt();  
}
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System.out.println("Max matrix is");  
for (int i = 0; i < process; i++) {  
    for (int j = 0; j < resources; j++) {  
        System.out.print(max[i][j]+" ");  
    }  
    System.out.println();  
}
```

```
System.out.println("Allocation matrix is ");  
for (int i = 0; i < process; i++) {  
    for (int j = 0; j < resources; j++) {  
        System.out.print(allocation[i][j]+" ");  
    }  
    System.out.println();  
}
```

```
System.out.println("Available matrix is ");  
for (int j = 0; j < resources; j++) {  
    System.out.print(available[j]+" ");  
}  
  
// need matrix  
for (int i = 0; i < process; i++) {  
    for (int j = 0; j < resources; j++) {  
        need[i][j]=max[i][j]-allocation[i][j];
```

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    }
}
System.out.println();

System.out.println("The need matrix is ");
for (int i = 0; i < process; i++) {
    for (int j = 0; j < resources; j++) {
        System.out.print(need[i][j]+" ");
    }
    System.out.println();
}

```

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int numberOfProcesses=0;
int safe=0; // 1 for => dead_lock occur

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while(process!=numberOfProcesses){
    if(safe==1){
        break;
    }
    int safe1=0; // 0 for => none of the process is executed
    for (int i = 0; i < process; i++) {
        int temp =0;
        if(processFlag[i]==0){
            for (int j = 0; j < resources; j++) {
                if (need[i][j]>available[j]){
                    temp=1;
                }
            }
        }
        if (temp==0){
            safe1=1;
        }
    }
}

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        processFlag[i]=1;

        System.out.println("process "+(i+1)+" is executed ");

        numberOfProcesses++;

        for (int j = 0; j < resources; j++) {

            available[j]=available[j]+allocation[i][j];

        }

        break;

    }

}

if(safe1==0){

    safe=1;

}

}

if(safe==1){

    System.out.println("dead");

}

}

}

```