

AIM Priority

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import java.util.Scanner;

public class Bankers{

private int need[],allocate[],max[],avail[],np,nr;

private void input(){

Scanner sc=new Scanner(System.in);

System.out.print("Enter no. of processes and resources : ");

np=sc.nextInt(); //no. of process

nr=sc.nextInt(); //no. of resources

need=new int[np][nr]; //initializing arrays

max=new int[np][nr];

allocate=new int[np][nr];

avail=new int[1][nr];

System.out.println("Enter allocation matrix -->");

for(int i=0;i<np;i++)

for(int j=0;j<nr;j++)

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

System.out.println("Enter max matrix -->");

for(int i=0;i<np;i++)

for(int j=0;j<nr;j++)

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

System.out.println("Enter available matrix -->");

for(int j=0;j<nr;j++)

avail[0][j]=sc.nextInt(); //available matrix

sc.close();

}

private int[][] calc_need(){

for(int i=0;i<np;i++)
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for(int j=0;j<nr;j++) //calculating need matrix
need[i][j]=max[i][j]-allocate[i][j];

return need;
}

private boolean check(int i){
//checking if all resources for ith process can be allocated
for(int j=0;j<nr;j++)
if(avail[0][j]<need[i][j])
return false;
return true;
}

public void isSafe(){
input();
calc_need();
boolean done[]=new boolean[np];
int j=0;while(j<np){ //until all process allocated
boolean allocated=false;
for(int i=0;i<np;i++)
if(!done[i] && check(i)){ //trying to allocate
for(int k=0;k<nr;k++)
avail[0][k]=avail[0][k]-need[i][k]+max[i][k];
System.out.println("Allocated process : "+i);
allocated=done[i]=true;
j++;
}
if(!allocated) break; //if no allocation
}

if(j==np) //if all processes are allocated
System.out.println("\nSafely allocated");
}

```

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else  
  
System.out.println("All proceess cant be allocated safely");  
  
}  
  
public static void main(String[] args) {  
    new Bankers().isSafe();  
}  
}
```