#include<stdio.h>

int al[21][21],ar[10],fr[10],rq[21][21],np,nr,i,j,k,t=0,t1=0;

void disp()

{

int i1,j1,k1;

for(k1=1;k1<=2;k1++)

{

if(k1==1)

{

printf("\nAllocated matrix is\n");

}

if(k1==2)

{

printf("\nResource matrix is\n");

}

for(i1=0;i1<np;i1++)

{

for(j1=0;j1<nr;j1++)

{

if(k1==1)

{

printf("%d\t",al[i1][j1]);

}

if(k1==2)

{

printf("%d\t",rq[i1][j1]);

}

}

printf("\n");

}

}

printf("Free resource is : ");

for(i1=0;i1<nr;i1++)

{

printf("%d\t",fr[i1]);

}

}

int main()

{

printf("Enter no.of processor : ");

scanf("%d",&np);

printf("Enter no.of resource : ");

scanf("%d",&nr);

for(i=0;i<nr;i++)

{

printf("Enter the no.of.resource %d present in the system : ",i+1);

scanf("%d",&ar[i]);

fr[i]=ar[i];

}

printf("Enter the resource allocated for all processes : \n");

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

{

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

{

scanf("%d",&al[i][j]);

fr[j]-=al[i][j];

}

}

printf("Enter the resource required for all processes : \n");

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

{

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

{

scanf("%d",&rq[i][j]);

}

}

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

{

for(k=0;k<np;k++)

{

t1=t=0;

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

{

if(fr[j]>=rq[k][j])

t++;

if(rq[k][j]==0)

t1++;

}

if((t==nr)&&(t1!=nr))

{

disp();

printf("\nProcess %d finished\n",k+1);

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

{

fr[j]+=al[k][j];

al[k][j]=rq[k][j]=0;

}

break;

}

}

if(((t==nr)&&(t1==nr))||(t!=nr))

break;

}

if(i==np)

printf("All the processor finished its work without any deadlock");

else

printf("Deadlock Occured");

}

/\*

Enter no.of processor : 5

Enter no.of resource : 4

Enter the no.of.resource 1 present in the system : 6

Enter the no.of.resource 2 present in the system : 3

Enter the no.of.resource 3 present in the system : 4

Enter the no.of.resource 4 present in the system : 2

Enter the resource allocated for all processes :

3 0 1 1 0 1 0 0 1 1 1 0 1 1 0 1 0 0 0 0

Enter the resource required for all processes :

1 1 0 0 0 1 1 2 3 1 0 0 0 0 1 0 2 1 1 0

Allocated matrix is

3 0 1 1

0 1 0 0

1 1 1 0

1 1 0 1

0 0 0 0

Resource matrix is

1 1 0 0

0 1 1 2

3 1 0 0

0 0 1 0

2 1 1 0

Free resource is : 1 0 2 0

Process 4 finished

Allocated matrix is

3 0 1 1

0 1 0 0

1 1 1 0

0 0 0 0

0 0 0 0

Resource matrix is

1 1 0 0

0 1 1 2

3 1 0 0

0 0 0 0

2 1 1 0

Free resource is : 2 1 2 1

Process 1 finished

Allocated matrix is

0 0 0 0

0 1 0 0

1 1 1 0

0 0 0 0

0 0 0 0

Resource matrix is

0 0 0 0

0 1 1 2

3 1 0 0

0 0 0 0

2 1 1 0

Free resource is : 5 1 3 2

Process 2 finished

Allocated matrix is

0 0 0 0

0 0 0 0

1 1 1 0

0 0 0 0

0 0 0 0

Resource matrix is

0 0 0 0

0 0 0 0

3 1 0 0

0 0 0 0

2 1 1 0

Free resource is : 5 2 3 2

Process 3 finished

Allocated matrix is

0 0 0 0

0 0 0 0

0 0 0 0

0 0 0 0

0 0 0 0

Resource matrix is

0 0 0 0

0 0 0 0

0 0 0 0

0 0 0 0

2 1 1 0

Free resource is : 6 3 4 2

Process 5 finished

All the processor finished its work without any deadlock

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