#include<stdio.h>

int main()

{

int allocation[10][5],max[10][5],need[10][5],available[2],flag[10],sq[10];

int n,r,i,j,k,count,count1=0;

printf("\n Input the number of processes running(<10)..");

scanf("%d",&n);

for(i=0;i<10;i++)

flag[i]=0;

printf("\n Input the number of resources (<5)..");

scanf("%d",&r);

printf("\n Input the allocation matrix for the processes in row major order..\n");

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

{

printf("\n Process %d\n",i);

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

{

printf("\n Resource %d\n",j);

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

}

}

printf("\n Input the no. of resources that a process can max have..\n");

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

{

printf("\n Process %d\n",i);

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

{

printf("\n Resource %d\n",j);

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

}

}

printf("\n Input the no. of available instances of each resource..\n");

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

{

printf("\n Resource %d\n",i);

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

}

printf("\n The need matrix is as follows :\n");

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

{

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

{

need[i][j]=max[i][j]-allocation[i][j];

printf("\t%d",need[i][j]);

}

printf("\n");

}

do{

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

{

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

{

if(flag[i]==0)

{

count=0;

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

{

if(available[j]>=need[i][j])

count++;

}

if(count==r)

{

count1++;

flag[i]=1;

sq[count1-1]=i;

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

{

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

}

break;

}

}

}

}

if(count1!=n)

{

printf("\n--------------IT'S AN UNSAFE STATE-------------");

break;

}

}while(count1!=n);

if(count1==n)

{

printf("\n\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*IT'S A SAFE STATE\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

printf("\n The safe sequence is...\n");

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

printf("\tP%d",sq[i]);

printf("\n");

printf("\nThe available matris is now:");

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

printf("\t%d",available[i]);

}

return(0);

}