#include<stdio.h>

void main()

{

char pro[10]={'A','B','C','D','E','F','G','H','I','J'},seq[10];

int avlbl[10],resrc[10],max[10][10],alloc[10][10],need[10][10],i,j,flag=0;

int proc,res,count=0,temp[10],temp1[10];

printf("ENTER THE NO. OF PROCESS = ");

scanf("%d",&proc);

printf("ENTER THE NO. OF RESOURCE TYPES = ");

scanf("%d",&res);

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

{

temp[i]=0;

temp1[i]=0;

}

printf("ENTER THE CURENTLY AVAILABLE RESOURCES OF EACH PROCESS(ALLOCATION MATRIX):\n");

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

{

printf("FOR PROCESS %c ",pro[i]);

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

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

}

printf("ENTER THE MAXIMUM REQUIRED RESOURCES OF EACH PROCESS(MAXIMUM MATRIX):\n");

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

{

printf("FOR PROCESS %c ",pro[i]);

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

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

}

printf("NEED OF RESOURCES OF EACH PROCESS(NEED MATRIX):");

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

{

printf("\nFOR PROCESS %c",pro[i]);

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

{need[i][j]=max[i][j]-alloc[i][j];

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

}

printf("\nENTER THE RESOURCE INSTANCES ");

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

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

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

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

temp1[i]=temp1[i]+alloc[j][i];

printf("AVAILABLE:");

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

{

avlbl[i]=resrc[i]-temp1[i];

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

}

loop:for(i=0;i<proc;i++)

{

if(temp[i]!=1)

{

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

{

if(avlbl[j]<need[i][j])

{

flag=1;

}

}

if(flag==0)

{

printf("\nPROCESS %c EXECUTED",pro[i]);

printf("\nAVAILABLE=\t");

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

{

avlbl[j]=avlbl[j]+alloc[i][j];

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

}

count++;

temp[i]=1;

seq[count-1]=pro[i];

}

else

flag=0;

}

}

if(count!=proc)

goto loop;

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

if(avlbl[i]==resrc[i])

{

printf("\nSAFE SEQUENCE:");

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

printf("%c\t",seq[i]);

}

}