#include<stdio.h>

#define MAX 50

int main(){

int n,m;

printf("Enter the number of process : \n");

scanf("%d",&n);

printf("Enter the number of resource : \n");

scanf("%d",&m);

int allocation[MAX][MAX];

printf("Enter Allocation : \n");

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

printf("For process %d\n",i);

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

printf("For Resource %d : ",j+1);

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

}

}

int max[MAX][MAX];

printf("Enter Max : \n");

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

printf("For process %d\n",i);

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

printf("For Resource %d : ",j+1);

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

}

}

int available[MAX];

printf("Enter Available : \n");

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

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

}

int need[MAX][MAX];

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

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

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

}

}

printf("\n");

printf("process\t\t\t\tAllocation\t\t\tMax\t\t\t\tAvailable\t\t\tNeed\n");

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

printf("%d\t\t\t",i);

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

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

}

printf("\t");

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

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

}

printf("\t");

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

if(i==0){

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

}

else{

printf("\t\t\t");

break;

}

}

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

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

}

printf("\n");

}

int finish[n];

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

finish[i]=0;

}

int safe[n];

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

safe[i]=-1;

}

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

if(safe[k]<0){

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

int flag=0;

if(finish[i]==0){

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

if(need[i][j]<=available[j]){

flag++;

}

if(flag==3){

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

finish[i]=1;

safe[i]=i;

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

}

}

}

}

}

}

printf("Safe Sequence : \n");

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

printf("%d ",safe[i]);

}

return 0;

}