

# Problem B

## Test the Rods

**Input:** standard input

**Output:** standard output

*National Construction and Project Centre (NCPC)* and the *Bureau of Civil Engineering Works (BCEW)* have been given the authority of testing and certifying the quality of rods used in construction works in the country. The *Get and Do* construction company has recently got a contract of construction at different sites of the country. Before the construction can start they want to get the rods from their  $n$  sites tested either at *NCPC* or at *BCEW*. *Get and Do* has got the permission of testing  $T_1$  rods at *NCPC* and  $T_2$  at *BCEW*. There are  $m_i$  samples at site  $i$  ( $1 \leq i \leq n$ ). Sum total of these samples over all the  $n$  sites is just equal to  $(T_1 + T_2)$ . The cost of testing  $j$  items from site  $i$  at *NCPC* is  $C_{i,j,1}$  and that of testing at *BCEW* is  $C_{i,j,2}$ . Write a program to find a minimum cost testing schedule for the *Get and Do* company.

## Input

The input may contain multiple test cases. The first line of each test case contains the two nonnegative integers  $T_1$  and  $T_2$  ( $1 \leq T_1 + T_2 \leq 300$ ). The next line contains  $n$  ( $1 \leq n \leq 30$ ). Then follow  $3n$  lines. For  $1 \leq i \leq n$ , line  $(3i - 2)$  contains the value of  $m_i$  ( $1 \leq m_i \leq 20$ ), line  $(3i - 1)$  contains  $m_i$  nonnegative integers  $C_{i,j,1}$  ( $1 \leq j \leq m_i$ ) and line  $3i$  contains  $m_i$  nonnegative integers  $C_{i,j,2}$  ( $1 \leq j \leq m_i$ ). You may assume that  $0 \leq C_{i,j,1}, C_{i,j,2} \leq 1000$ .

A test case containing two zeros for  $T_1$  and  $T_2$  terminates the input, and this case must not be processed.

## Output

For each test case in the input print two lines. The first line contains an integer giving the minimum cost for testing all the samples at *NCPC* and *BCEW*. The next line contains  $n$  integers with two consecutive integers separated by a single space. The  $i$ -th integer gives the numbers of samples from site  $i$  that are tested at *NCPC* (it is implicit that the rest are tested at *BCEW*). Note that the second output line is not unique, and hence any optimal testing schedule is acceptable. Print a blank line after the outputs of each test case.

## Sample Input

```
10 12
```

```
5
5
10 30 70 150 310
10 20 40 60 180
7
30 60 90 120 160 200 240
20 60 100 130 160 200 240
4
40 60 80 100
30 70 100 120
3
60 120 180
20 50 90
3
30 70 100
30 70 100
0 0
```

## Sample Output

```
580
1 3 4 0 2
```

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*"Two things are infinite. One is the universe, the other is human stupidity and I am not sure about the former."*