

Problem C - Smart homes

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CSC1015F - problem set

Eskom is trying hard to come up with ways to make people use less electricity, not by load shedding, but by user-mediated ‘load balancing’ through making the users more aware of their electricity usage. They’ve come up with this new scheme for user self-control: if a user uses more than allowed on the scheme he or she has chosen, at any particular time, then the fuse is blown (or main switch switched off). This should prevent a conscious user from doing silly things, like having and the stereo on, and the TV, and heating up food in the microwave all at the same time.

This needs to be calibrated first to find out what would be sensible smart fuse specifications and so that each more or less conscious user can pick the plan that suits them. Also, it would be good to have a warning system for the user, like a “don’t go switching on another device, else your fuse is going to blow up” message, but we leave that for the next round of software development. Now Eskom has asked you to make a simulation for it.

Input The input consists of several test cases. Each test case describes a set of electrical devices and gives a sequence of turn on/off operations for these devices. The first line of each test case contains three integers n , m and c , where n is the number of devices ($n \leq 20$), m is the number of operations performed on these devices and c is the capacity of the fuse/main switch (in Amperes, if you must know). The following n lines contain one positive integer c_i each, being the consumption (in Amperes) of the i -th device.

This is followed by m lines also containing one integer each (between 1 and n , inclusive). They describe a sequence of turn on/turn off operations performed on the devices. For every number, the state of that particular devices is toggled: if it is currently running, then it is turned off, and if it is currently turned off, then it will be switched on. At the beginning all devices are turned off. The input will be terminated by a test case starting with $n = m = c = 0$, which should not be processed.

Output For each test case, the first line of the output the number of the test case. Then, on the second line, output whether the fuse would have been blown during the operation sequence. The fuse would have been blown if the sum of the power consumptions c_i of turned on devices at some point exceeds the capacity of the smart fuse, c .

If the fuse would not have been blown, then also output the maximal power consumption by the turned on devices that occurred during the sequence.

Finally, output a blank line after each test case.

(turn over page for sample in/out)

Sample input

```
2 2 10
5
7
1
2
3 6 10
2
5
7
2
1
2
3
1
3
0 0 0
```

Sample output

```
Sequence 1
Fuse was blown.

Sequence 2
Fuse was not blown.
Maximal power consumption was 9 amperes.
```