# 2734 - Water Tanks

Oceania - South Pacific - 2003/2004

There are *n* identical large cylindrical tanks for storing water. The tanks are arranged in a circle on level ground. Each tank is connected with its two neighbours by means of pipes situated at its base. There is a valve between each adjacent pair of tanks (tank *n* is next to tank 1). All valves are initially closed. All the outlets and the pipes are at the same level and are always full of water, even if all the tanks are deemed to be ``empty''. The volume in any tank is measured by the height of the surface of the water above the level of the top of the outlets. If all valves (or all valves but one) are opened so that water can flow between the tanks, then the levels will eventually equalise. Conversely, if all tanks are initially at the same level, no valves need be opened to equalise the levels. Thus it may be necessary to only open some of the valves to achieve this result. For example, consider *n* = 4 tanks each 5 metres high. Assume that the water level in these tanks is at 4, 4, 3, and 3 meters respectively. Their water level will equalise if we open the valves between tanks #2 and #3 and between #4 and #1, as suggested by the following diagram. Thus for this set we need to open only two valves:
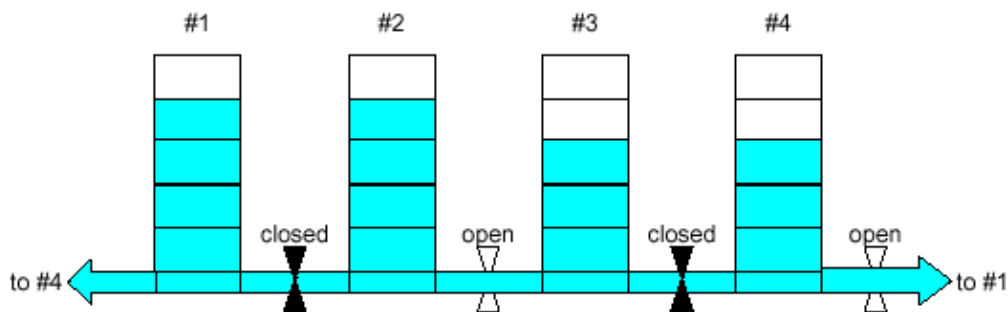
Given a set of initial heights, determine the minimum number of valves to open so that the final water levels in all tanks is equal.

Input

The input will consist of one or more scenarios, each scenario consisting of two lines. The first line contains a descriptive title, which is a string of letters or spaces no more than 200 characters long, containing at least 1 letter. The second line starts with the number of basins *n* ($3 \le n \le 200$), a space, and then *n* integers in the

range 0 to 99, separated by single spaces, representing the water levels in the tanks. The scenarios sequence is terminated by a single `#' character on a line by itself.

Note: The input data for this program may contain lines up to 600 characters long.

Output

Output one line for each input scenario. The line consists of the first letter of each word in the descriptive title in upper case, followed by a colon (`:'), a space, and then the minimum number of valves that need to be open to achieve equal heights in all tanks.

Sample Input

```
High four dude basins
4 4 4 3 3
```

```
The Australasian eight
8 2 1 1 2 2 1 1 6
#
```

Sample Output

```
HFDB: 2
TAE: 5
```

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