

## 3801 Longest Run on a Snowboard

Mickie likes snowboarding. That's not very surprising, since snowboarding is really great. The bad thing is that in order to gain speed, the area must slope downwards. Another disadvantage is that when you've reached the bottom of the hill you have to walk up again or wait for the ski-lift.

Mickie and his friend Minnie are on a snowboarding adventure. Minnie offers to pay Mickie in thousands of dollars equivalent to the number of points he covers. But she poses a constraint: during his ride he should not choose a point whose height value is co-prime to the current point's height. (Two integers are co-prime if they do not have a common factor e.g. 14 and 15.)

Mickie has urgently called you over phone and pleads you to help him in his challenge. He would like to know how long the longest run in an area is. That area is given by a grid of numbers, defining the heights at those points. Look at this example:

```
7  2  3  4  5
36 37 38 34 6
33 44 46 40 7
24 43 42 41 8
35 32 31 30 9
```

One can slide down from one point to a connected other one if and only if the height decreases and the heights are not co-prime. One point is connected to another if it's at left, at right, above or below it. In the sample map, a possible slide would be **36-33-24** (start at **36**, end at **24**). Of course if you would go **46-44-33-24** or **46-38-34-4** or **46-40-34-4**, it would be a much longer run. If there are more than one run of equal length, pick the one where the first different point comes earlier in the grid (minimum in  $x$ -co-ordinate first, and then in  $y$ , assuming that the top left corner is  $(0, 0)$ ). In the case above, we will pick **46-38-34-4**.

### Input

All input comes from standard input. The first line contains the number of test cases  $N$ . Each test case starts with a line containing the name (it's a single string), the number of rows  $R$  and the number of columns  $C$ . After that follow  $R$  lines with  $C$  numbers each, defining the heights.  $R$  and  $C$  won't be bigger than 100,  $N$  not bigger than 15 and the heights are always in the range from 2 to 100.

### Output

For each test case, print a line to standard output containing the name of the area, a colon, a space and the length of the longest run (maximum points covered) one can slide down in that area. The path taken by Mickie is printed in the next line, each point separated by a blank space from the next.

### Sample Input

```
2
disney 5 5
96 57 56 41 93
87 58 33 83 77
49 52 39 76 66
47 79 36 31 43
```

```
3 12 27 29 2
midas 4 3
87 86 5
71 72 57
64 51 3
45 31 22
```

### Sample Output

```
disney: 9
96 87 58 52 39 36 27 12 3
midas: 4
86 72 57 3
```