Solve the puzzle.

▶ Input

numberOfTests $test_1$ $test_2$ … $test_{numberOfTests}$

test: rows cols numberOfPoints $Point_1$ $Point_2$ … $Point_{numberOfPoints}$ numberOfInputPaths

numberOfPaths will always be 0

input format is the same as for level 5 and 6

Output ▶

numberOfTests $numberOfPaths_{test1}$ $path_{1,\ test1}$ $path_{2,\ test1}$ … $path_{numberOfPaths,\ test1}$ $numberOfPaths_{test2}$ …

where $path_{i,j}$ is the path of *i*-th color of the j-th test

the paths need to be sorted by their color (in ascending order)

every path has two margins. The position with the smaller number is the starting point

- **Good path: 1 5 3 E E E**
- ~~bad path: 1 8 3 W W W~~

There is only one valid solution for each test case.

A valid solution fills the entire board. (After connecting all the points, no empty positions should be left on the board.)

There may be invalid solutions that connect all the points but don't fill the entire board.

Example input

tests | number of points

1 5 5 8 1 1 5 1 7 2 8 3 9 2 10 4 17 3 24 4 0

size of board | number of paths

Example output

number of tests

1 4 1 1 4 E E E E 2 7 10 W S S S E E N E N N 3 8 3 S W S 4 10 4 S S S W

number of paths