Check connectivity.

There are two points for each color. These points can be:

1. connected (status=1)
2. connectable (status=2)
3. not connectable (status=3)

For each color on the board return their status.

Vocabulary

- Test: rows cols numberOfPoints $Point_1$ $Point_2$ … $Point_{numberOfPoints}$ numberOfPaths $Path_1$ $Path_2$ … $Path_{numberOfPaths}$

- 0<= numberOfPaths <= numberOfPoints/2
- all the paths are valid
- test has the same format as an input from level 3 or 4.

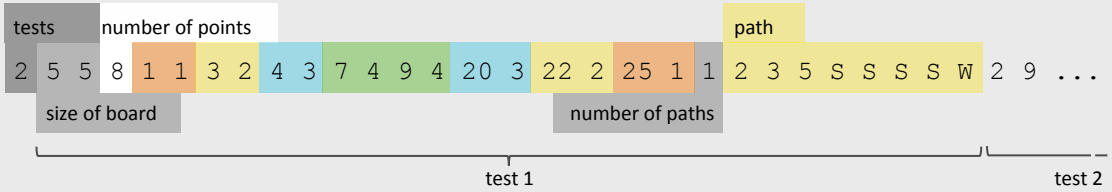
Input

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

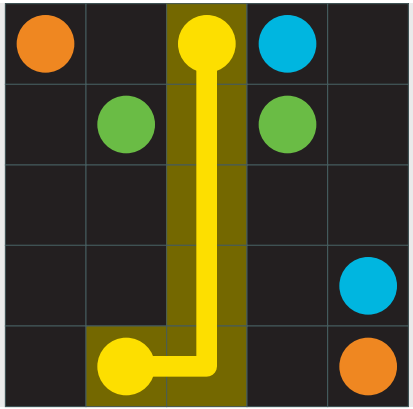
Output

- $S_{test1,c1}$ $S_{test1,c2}$ … $S_{test1,cnumberOfPoints/2}$ … $S_{testnumberofTest,c1}$ … $S_{testnumberOfTestsc,numberOfPoints/2}$

Example input



Example output



The question, *Can they be connected*? must be answered given the current state of the board. This state is read from the input, and does not change.

In this example: yellow is connected, and both red and blue can be connected.

You don’t have to consider the case: *If blue is connected, then red becomes unconnectable.*