

# Addictive Game

**PERFORMANCE LEVEL**

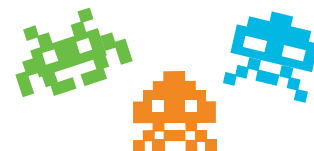
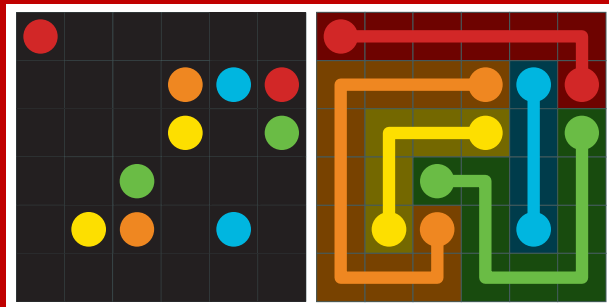


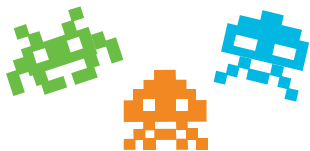


Hi,

The topic of this contest is the addictive online and mobile game **Flow**. *Please read the requirements carefully, since they may differ from the standard game, and we don't suppose that you have ever played the game.*

In general the **point of the game** is to connect the points of the same color with lines. Each line starts at a point and ends in a point with the same color. The lines may not intersect.





The PERFORMANCE LEVEL has the same topic as the previous Catalysts Coding Contest held in Linz and Cluj on 16-05-2014.

If you competed at the event feel free to [skip to the Tasks page](#).

The idea, keywords, and definitions are the same.

› There are some minor changes in the rules and the output format, so please read that section carefully.

If you didn't compete in the previous event, we recommend you to [solve the CCC-Game "Addicive Game" first](#).

If you feel real confident you can start with the PERFORMANCE LEVEL right away!



## Vocabulary

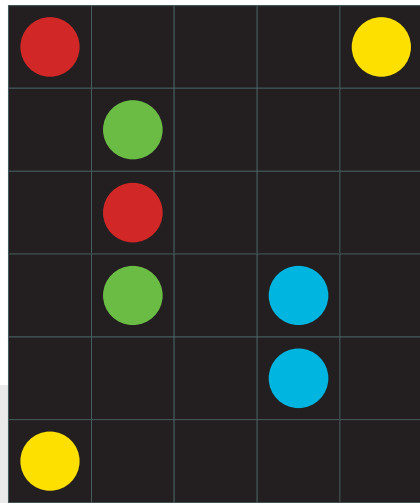
- The game is played on a **board** of size **rows** x **cols**.
- There are **rows** x **cols** **positions** on the board.
- A position is defined by its order number, as shown on the image.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24



## Vocabulary

- There are **points** on the board.
- A **point** is defined by it's **position** and **color** (p,c).
- **Colors** are represented by consecutive integers: 1, 2, 3, ...
- Each **color** appears exactly twice on the board
  - If there are 8 **points** on the **board**, then there are 4 **colors**, numbered from 1 up to 4.



The board from the image can be defined as follows:

rows: 6    cols: 5    number of points: 8

$p_1$ : (1,4)     $p_2$ : (5,2)     $p_3$ : (7,3)     $p_4$ : (12,4)     $p_5$ : (17,3)     $p_6$ : (19,1)     $p_7$ : (24,1)     $p_8$ : (26,2)



## Vocabulary

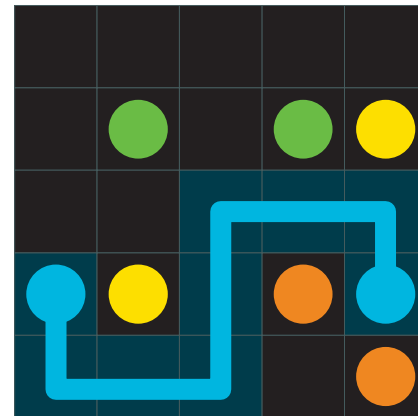
Given a **board** with **points**, you will need to draw **paths**. A **path** is defined by it's **color**, **starting position**, **length**, and **steps**.

Given the current position  $p$ , performing a step will lead to:

- N:  $p - \text{rows}$
- E:  $p + 1$
- S:  $p + \text{rows}$
- W:  $p - 1$ 
  - steps can not be taken outside of the board
  - if you're in the rightmost column, you can't step East.

The path from the image can be defined as follows →

*(both representations are valid. A path can be represented only in these two ways)*



color: 3 (same as color of starting point)  
starting position: 16  
length: 8  
steps: [S,E,E,N,N,E,E,S]

OR

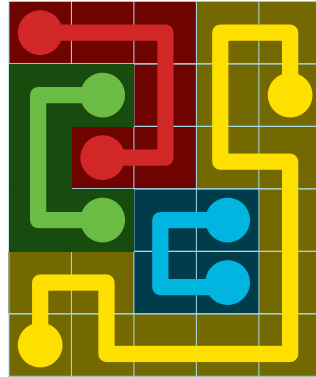
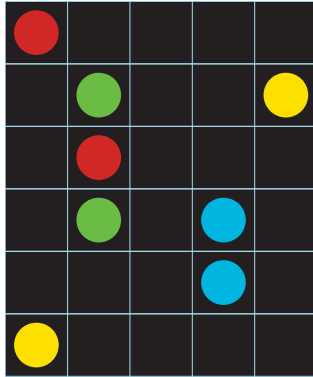
color: 3 (same as color of starting point)  
starting position: 20  
length: 8  
steps: [N,W,W,S,S,W,W,N]



## Task

Your task is to connect all pairs of points with the same color, with paths.

- The paths can't leave the board, can't intersect, and can't touch points of different color.
- A path must start and end at a point with the same color.
- The paths must fill the entire board.
- In case of multiple solutions any valid solution is accepted.





## ► Input

Each input has multiple tests. One test will have the form:  
rows cols numberOfPoints Point<sub>1</sub> Point<sub>2</sub> ... Point<sub>numberOfPoints</sub> 0

where Point<sub>i</sub> :

- position<sub>i</sub> color<sub>i</sub>

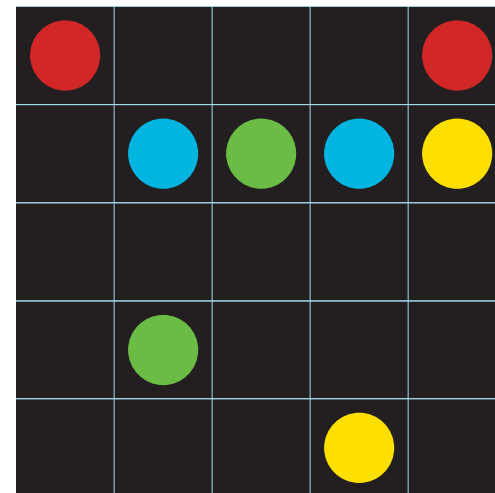
The input will consist of a list of tests:

- numberOfTests test<sub>1</sub> test<sub>2</sub> test<sub>numberOfTests</sub>

### 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																







## Output►

Your output has to contain the solution to all the tests:

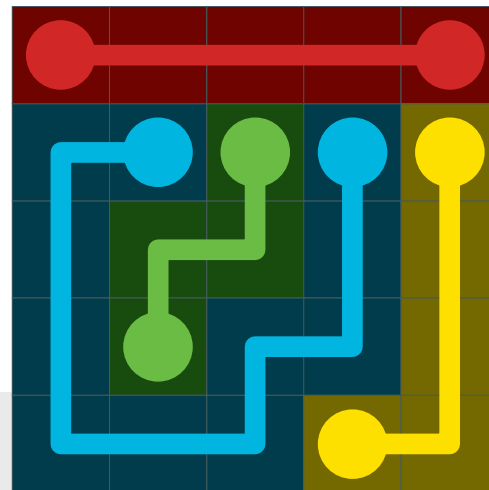
numberOfTests solution<sub>1</sub> solution<sub>2</sub> solution<sub>numberOfTests</sub>

Every solution should have the form:

- numberOfPaths path<sub>1</sub> path<sub>2</sub> path<sub>3</sub> ... path<sub>numberOfPaths</sub>

where Path:

- color startingPoint length step<sub>1</sub> step<sub>2</sub> step<sub>3</sub> ... step<sub>length</sub>



### 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