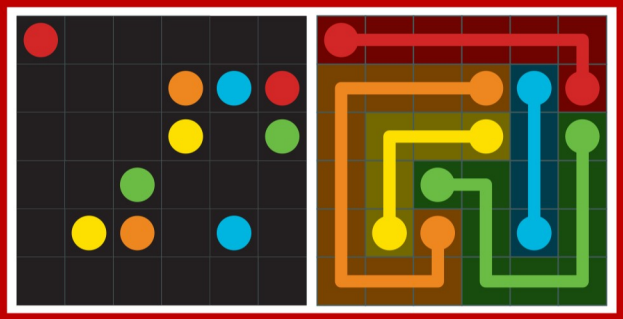
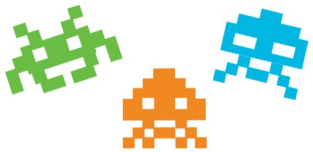

Addictive
Game
PERFORMANCE LEVEL
PERFORMANCE
CCC
Catalysts
software is our passion

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.

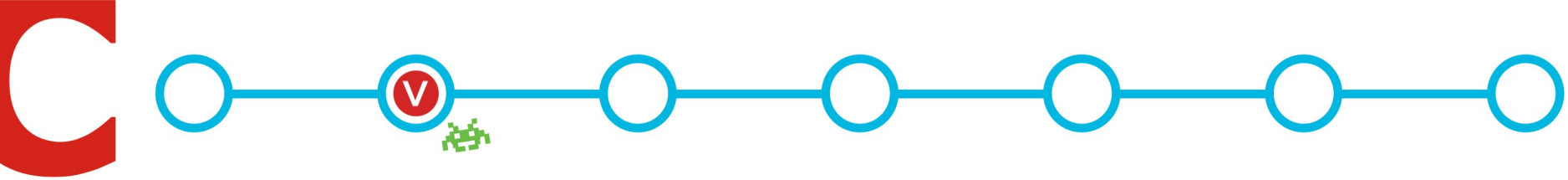




The PERFORMANCE LEVEL has the same topic as the previous Catalysts Coding Contest held in Linz and Cluj on 16-05-2014.

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.

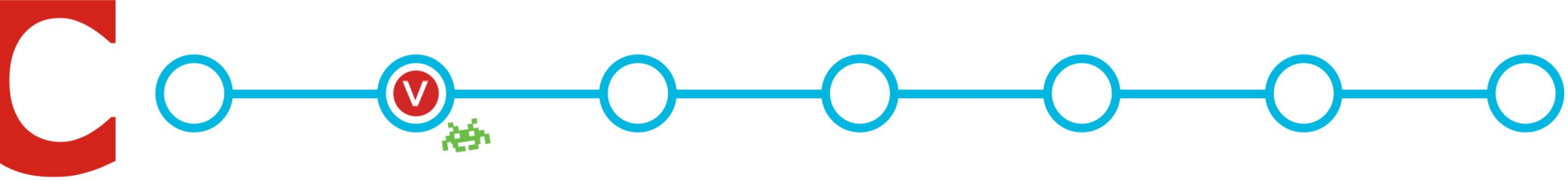
If you didn't compete in the previous event, we recommend you to *solve the CCC-Game "Addicive Game" first*.
If you feel real confident you can start with the PERFORMANCE LEVEL right away!



Vocabulary

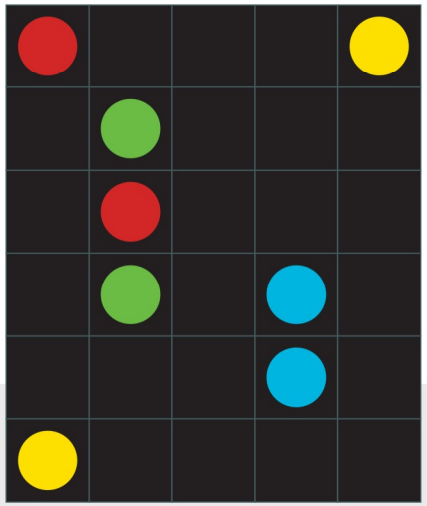
- The game is played on a **board** of size **rows** x **cols**.
- There are **rows** x **cols positions** on the board.
- A position is defined by its order number, as shown on the image.

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).
- **Color**s 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

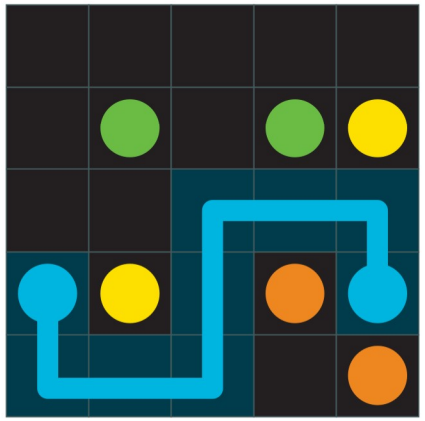
p_1: (1,4) p_2: (5,2) p_3: (7,3) p_4: (12,4) p_5: (17,3) p_6: (19,1) p_7: (24,1) p_8: (26,2)

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-rows*
- E: *p+1*
- S: *p+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 →



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

OR

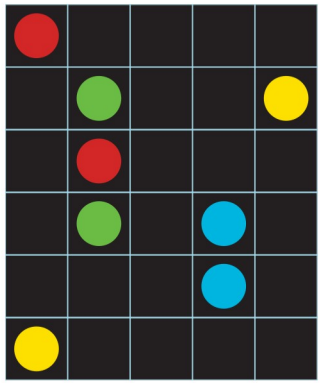
color: 3 (same as color of starting point)
starting position: 20
length: 8
steps: [N,W,W,S,S,W,W,N]

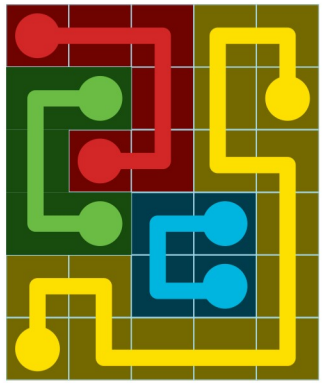
(both representations are valid. A path can be represented only in these two ways)

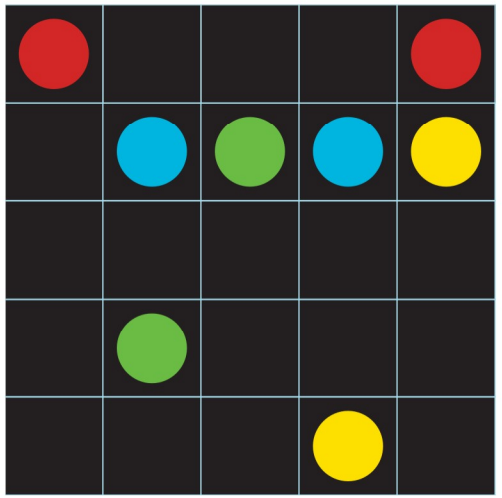
Task

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 $Point_1$ $Point_2$ ... $Point_{numberOfPoints}$ 0
where $Point_i$:

- $position_i$ $color_i$

The input will consist of a list of tests:

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

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 $solution_1$ $solution_2$ $solution_{numberOfTests}$

Every solution should have the form:

- numberOfPaths $path_1$ $path_2$ $path_3$ … $path_{numberOfPaths}$

where Path:

- color startingPoint length $step_1$ $step_2$ $step_3$ … $step_{length}$

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