Draw the board.

You need to create a black and white image from the board. Each image will contain it's solution text. The size of the image will be size of the board (*rows x cols*). Place a black pixel to every position that contains a point, or a segment of a valid line.

- Draw all the points.
- For all lines:
  - if *i*-th line is valid, draw it
  - if *i*-th line is invalid, discard it.
  - the order is important!
    - *i*-th line might cause *i+x*-th line to be invalid.

Line validity is the same as described at level 3, with one extra rule:

- A line is invalid if it crosses any other line.

Input

rows cols numberOfPoints $Point_1$ $Point_2$ … $Point_{numberOfPoints}$

numberOfPaths $Path_1$ $Path_2$ … $Path_{numberOfPaths}$

exactly the same as for level 3

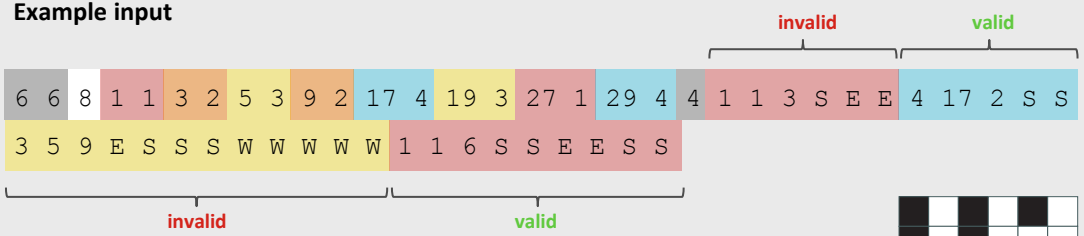
0<= numberOfPaths <= infinity :)

Output

Upper case word. May contain upper case english characters, and spaces.

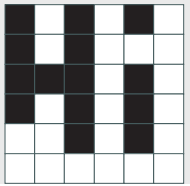
(use only a single space to separate words)

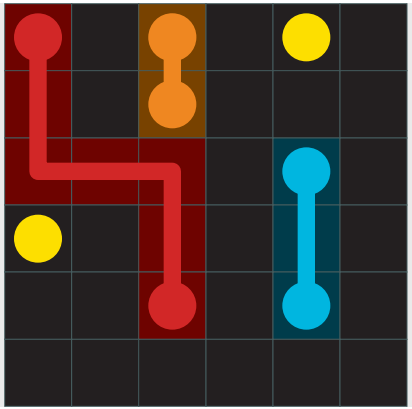
Example input



Example output

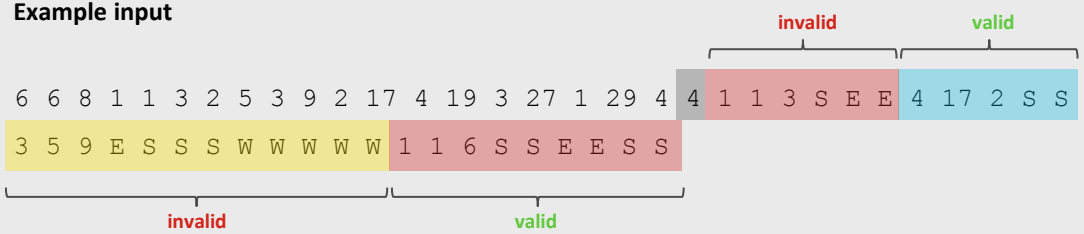
```
HI
```





- First line is invalid, crosses other point. SKIP
- Second line is valid. DRAW
- Third line crosses second line. (order is important) Invalid. SKIP
- Fourth line is valid. DRAW
    - Even though we already had a line starting from position 1, since that line was invalid, it was discarded, so we can have a valid line starting from position 1.

Example input



Example output

```
HI
```