Beers

All submissions
Best submissions

Points: 100 (partial)
Time limit: 0.2s
Memory limit: 32M
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Tags
Arrays, Graphs
Difficulty
Hard

Coki loves numbers. He also loves beer.

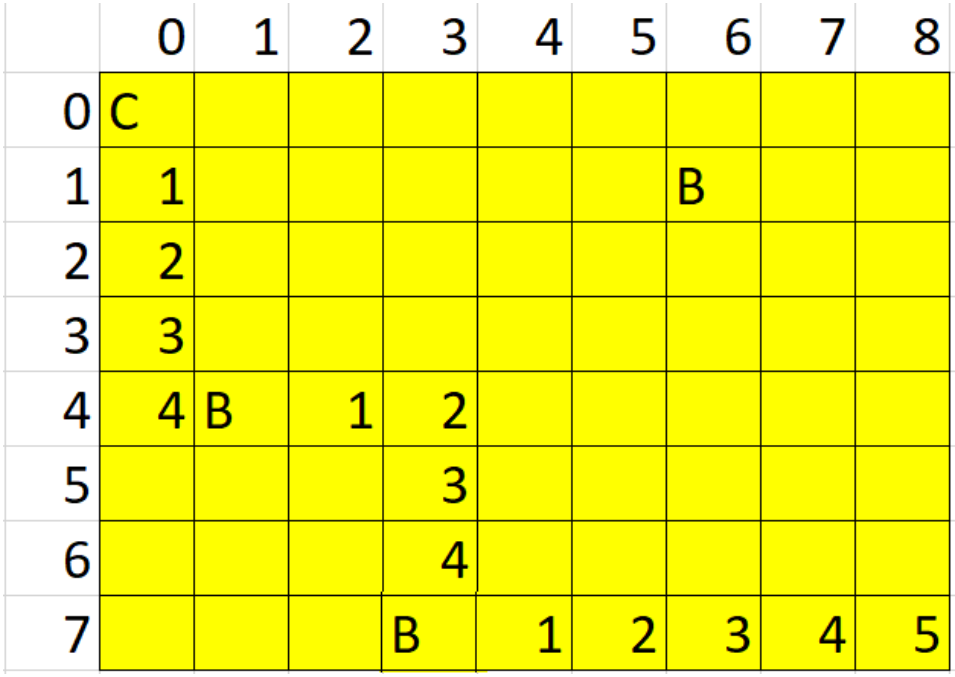
His evil-genious twin Koci, deserted him in a desert. He also left some beers, so Coki can refresh himself.

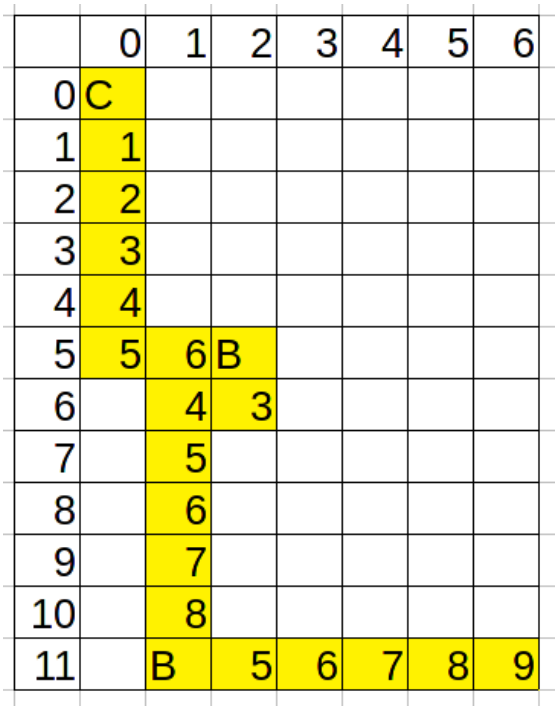
You can think of the desert as a rectangular field with size `NxM`.

- On any of the cells, there can be a stack of beers.
- Coki can move to a next cell and only in 4 directions
  - Top, left, right and bottom
- Each move of Coki takes him 1 time
- Each stack of beers refreshes Coki with exactly 5 time
- Coki always starts from the top-left corner and the exit is always on the bottom right corner

Help Coki to reach the exit as fast as possible!

Examples





Input

- Read from the standard input
- On the first line are the numbers `N`, `M` and `B`
  - `N` and `M` are the dimensions of the field
  - `B` is the number of stacks of beers
- On the next `B` lines find the coordinates of the stacks of beer

Output

Print to the standard output

- On the single line of the output, print the minimal time it takes Coki to reach the exit

Constraints

- `N` and `M` are always less than 2^22
- `B` is less than 2^14
- The time will never be less than 0
  - Even if you collect all stacks of beers

Sample tests

Input

```
7 8 3
4 1
7 3
1 6
```

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Output

```
5
```

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Comments

1