Hasso Plattner Institut
IT Systems Engineering | Universität Potsdam

Prof. Dr. Friedrich, Dr. Lenzner, Boockmeyer, Neumann, Stangl
Sommersemester 2017

Week 13 – (Adv.) Competitive Programming

Abgabe 18.07.2017 15:15 Uhr, über das Judge-Interface

collecting: (100 points - 2 seconds timelimit)

The robot Blaine lives in a rectangular coordinate system. Each place has exact integer coordinates (x and y). There are also some coins placed in this world. Your task is to find the length of the shortest path to collect all coins from Blaine's starting position and return back afterwards.

Blaine can't move diagonally, only move along the x and y axis. Moving from one position (i, j) to an adjacent position $(i, j + 1)$, $(i, j - 1)$, $(i - 1, j)$, or $(i + 1, j)$ has a cost of one.

Input The first line defines the number of test cases.

The first input line of each test case defines the size of the world (x-size, y-size, where $1 \leq x, y \leq 20$). The next line contains the start position as coordinates. The line afterwards gives the amount of coins n ($1 \leq n \leq 10$). Each of the following n lines contains the position of one coin.

Output Please print one line per test case. Each line should contain the length of the shortest path.

Points There are two groups of test sets.

- For the first group worth 30 point you can assume, that $1 \leq x, y \leq 5$ and $1 \leq n \leq 5$.
- For the first group worth 70 points you can assume, that $1 \leq x, y \leq 20$ and $1 \leq n \leq 10$.

Sample Input

```
1
10 10
1 1
```

```
4
2 3
5 5
9 4
6 5
```

Sample Output

```
24
```