

SPOJ Problem Set (classical)

1672. The Great Indian Wedding

Problem code: GIWED

A wedding is to be organized in a rectangular park of dimensions M by N . Some parts of the park are covered by K rectangular carpets. These carpets, produced by ItSucks Corporation are revolutionary self cleaning carpets - they suck any liquid they come in contact with! The organizer wants to water the park to keep the grass fresh. If there were no carpets, the organizer could have used a single pipe to water the whole park but unfortunately, the water doesn't seep through the carpets. The organizer has at his disposal L pipes. The pipes would be placed at fixed locations chosen by the organizer and can't be moved. Water spreads from a pipe in all directions unless obstructed by the park boundary or a carpet. What is the maximum area that can be watered using these L pipes?

Input

The first line of the input contains a single integer T , the number of test cases ($1 \leq T \leq 30$). Each test case starts with a single line containing the values M, N, K and L ($1 \leq M \leq 10000$, $1 \leq N \leq 10000$, $0 \leq K \leq 50$, $1 \leq L \leq 10$). It is followed by K lines, each line containing 4 integers separated by single spaces, x_1, y_1, x_2, y_2 where (x_1, y_1) and (x_2, y_2) are the zero based coordinates of lower left and upper right vertex of the carpet. Assume that $x_1 < x_2$ and $y_1 < y_2$. The carpets may cover each other. Water would not be able to seep through even if two carpets touch in a corner.

Output

For each test case, print the maximum area that can be watered on a single line

Example

Input :

```
2
10 10 0 1
10 10 1 1
3 3 4 4
```

Output :

```
100
99
```

Added by: Rahul Garg
Date: 2007-07-04
Time limit: 1s
Source limit: 50000B
Languages: All
Resource: C-maphore, Tryst 2007