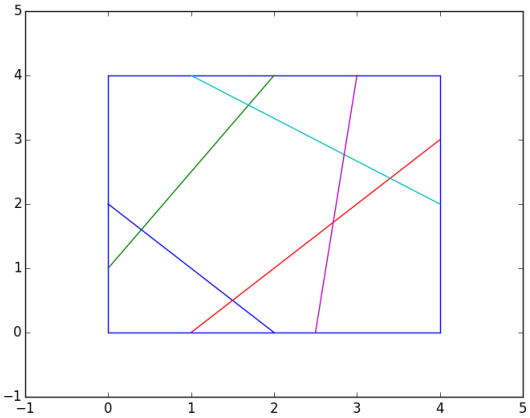
Problem E - The Precious Puzzle

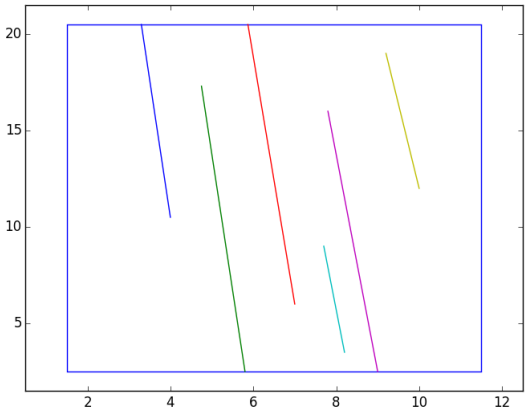
Description

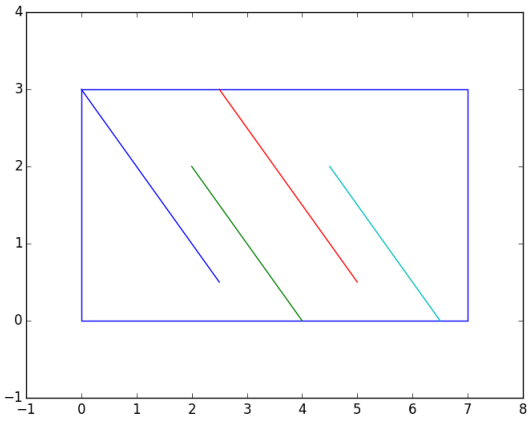
Mr. Jerry S. needs your help with his new problem. He really likes his wooden puzzle collection, but he has a favorite one, a Japanese puzzle box that is very precious to him (and very expensive!). He now plans to have a room to keep that precious puzzle safe from burglars. Seen from above, the room has a rectangular shape, the entrance is from left and the puzzle will be kept at the right end of the room. To maximize the chance of detecting a burglar, he will place several lasers around the room. Since he has several rooms available in his house and so many possible locations and orientations for the lasers, he decided to use an optimisation software once again to automatically test several of these combinations and tell him the best choice. In order to use this software, he needs a way to evaluate how good each possible configuration is (size of the room, laser range, laser location and orientation). Since the burglar will have to cross the room from left to right, the higher the number of times the burglar needs to jump over lasers, the better. Therefore, for each possible configuration, he wants you to tell him the minimum number of times the burglar needs to jump over lasers in order to cross the room from left to right.

The Task

You will be given the coordinates of the lower and upper corners of the (rectangular-shaped) room as well as the information regarding every laser. Assuming that the burglar does not jump where two lasers cross (it is too dangerous!), can walk around the lasers (**but never backwards!**) and will jump only if he really has to, you have to report the minimum number of times the burglar has to jump to cross the room from left to right. The following figures show three rooms for which the minimum number of jumps is 3 (left) and 0 (middle) and 2 (right).







Note: You can assume that lasers do not (partially) overlap, are fully contained inside the room and no two lasers start/end at the exact same location.

Input

The first line contains the number of test cases, *T*. For each test case, the first line contains four numbers, x1, y1, x2, y2, representing the lower corner (x1,y1) and the upper corner (x2, y2) of the room. Then, a line with a single number, *L* follows, which represent the number of lasers. Then *L* lines follow. Each line contains four number, x1, y1, x2, y2, representing the the two end points of a laser. The end points are (x1,y1) and (x2,y2).

Output

For each test case, print the minimum number of jumps required to cross the room from anywhere in the left wall to anywhere in the right wall.

Constraints

- *1 ≤ T ≤ 20*
- *1 ≤ L ≤ 1000*

Example

Example input:

```
3
0 0 4 4
5
0 2 2 0
0 1 2 4
1 0 4 3
1 4 4 2
2.5 0 3 4
1.5 2.5 11.5 20.5
6
3.3 20.5 4.0 10.5
7.7 9 8.2 3.5
4.75 17.3 5.8 2.5
9.2 19 10 12
5.87 20.5 7.0 6
```

```
7.8 16 9 2.5
0 0 7 3
4
0 3 2.5 0.5
2 2 4 0
2.5 3 5 0.5
4.5 2 6.5 0
```

Example output:

```
3
0
2
```
