Problem J – Exploring the Mars

Now, the first phrase of the exploring the Mars was finished, little Long and his colleagues have their general ideas about every zones of the Mars. They believe that in there is a very high chance of finding water on a specific zone. Thus, in the next phrase of this mission, they will use an upgraded robot to search only in this zone. It will follow a routine:

1. Place in the 1st position, mark this position as known,
2. Number of known position $n = 1$,
3. Repeat operations:
   a) From a known position u, go to a new position $n + 1$,
   b) Mark this position as known and increase n by 1,
   c) Find the trace of water,
   d) Recalculating the map of known positions.

The recalculating the map of known positions is a very important task because the rocky surface may force the robot to deviate from its planed route. In this process, one important parameter of the map of known positions is the longest distance between two known positions which shows how breath the search is.

Little Long is responsible for doing the recalculating the map function. Because this function is very important, he wants somebody to write the same function so that they can crosscheck with each other. Can you help him to do that?

Input

The input starts with a number T ($T \leq 10$) which denotes the number of test cases. Then T test cases follow. Each test case starts with a number Q ($1 \leq Q \leq 30000$) which denotes the number of repeat operations. Then Q lines follow, each consist of 2 positive integers u and c where u is the known position (step 3a) and c is the distance to the new position. ($1 \leq c \leq 100000$)

Output

For each repeat operation in the input, print the longest distance between two known positions.

Sample

Sample input	Output for sample input
1 5 1 10 1 10 2 5 3 5 5 10	10 20 25 30 40