

# Huge Clouds

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         256 megabytes

It's a starry night and DreamGrid is counting stars. Unfortunately, it becomes cloudy and many stars are hidden from view. DreamGrid wants to go out of the shadow and find a place where at least one star can be seen. He wants to know the total area of the shadow first.

There are  $n$  stars and  $m$  clouds in the sky. Formally, each star is represented by a point  $(x_i, y_i)$  ( $1 \leq i \leq n$ ) in a two-dimensional plane. The  $i$ -th ( $1 \leq i \leq m$ ) cloud is represented by a segment  $(u_{i1}, v_{i1}) - (u_{i2}, v_{i2})$ , where  $(u_{i1}, v_{i1})$  and  $(u_{i2}, v_{i2})$  are the two endpoints of the segment.

For a viewpoint  $(x, 0)$  on the x-axis, DreamGrid considers it to be in shadow if none of the stars can be seen there. A star can be seen at a viewpoint if the segment connecting the viewpoint and the star doesn't intersect with any cloud (including the endpoints of a cloud). Note that if a cloud (including its endpoints) goes through a star, the star can't be seen anywhere.

It's tiring to go through the whole x-axis and calculate the total shadow area. Can you tell DreamGrid the total area (length) covered by shadow on the x-axis?

## Input

The input contains multiple cases. The first line of the input contains a single integer  $T$  ( $1 \leq T \leq 500$ ), the number of cases.

For each case, the first line of the input contains two integers  $n$  and  $m$  ( $1 \leq n, m \leq 500$ ), the number of stars and clouds. The following  $n$  lines describe the positions of the stars. The  $i$ -th ( $1 \leq i \leq n$ ) line contains two integers  $x_i$  and  $y_i$  ( $-10^4 \leq x_i \leq 10^4$ ,  $1 \leq y_i \leq 10^4$ ), the position of the  $i$ -th star. The following  $m$  lines describe the positions of the clouds. The  $i$ -th ( $1 \leq i \leq m$ ) line contains four integers  $u_{i1}, v_{i1}, u_{i2}, v_{i2}$  ( $-10^4 \leq u_{i1}, u_{i2} \leq 10^4$ ,  $1 \leq v_{i1}, v_{i2} \leq 10^4$ ,  $(u_{i1}, v_{i1}) \neq (u_{i2}, v_{i2})$ ), the positions of the endpoints of the  $i$ -th cloud.

It's guaranteed that the number of cases where  $\max(n, m) \geq 100$  doesn't exceed 5. Please note that multiple stars can be in the same position, and the clouds can intersect and overlap with each other.

## Output

For each case, print a single line containing a single real number, denoting the total area (length) of shadow on the x-axis. If the answer is larger than  $10^9$ , print  $-1$  instead.

Your answer will be accepted if and only if the absolute or relative error does not exceed  $10^{-4}$ .

## Example

standard input	standard output
8	3.0000000000
1 2	1.5000000000
0 3	8000.0000000000
-2 1 -1 1	-1
2 1 1 1	-1
1 2	200000000.0000000000
0 3	199980000.0000000000
-2 1 -1 1	20002.0003000500
1 2 2 1	
2 2	
10000 100	
-10000 100	
-10000 50 -3000 50	
10000 50 3000 50	
2 2	
0 3	
-1 10	
3 2 0 1	
0 1 -1 10	
1 1	
0 2	
1 1 3 2	
1 1	
0 10000	
-10000 9999 10000 9999	
1 1	
0 10000	
-9999 9999 9999 9999	
1 1	
0 10000	
-10000 1 9999 2	

## Note

For the first sample case, the range of the shadow is  $[-3, -1.5] \cup [1.5, 3]$ .

For the fourth sample case, the second star is covered by the second cloud, so it can't be seen anywhere.