French Fries Festival 2

Description

French Fries Festival is the most important festival in French. French Fries Festival starts on 7/17 every year and lasts for 365 days. Today(2016/7/30) is on French Fries Festival! Hurray!

During French Fries Festival, there will be lots of free french fries everywhere. As a big fan of French Fries Festival, you have eaten lots of french fries these day. However, you think that waiting the morning and sharing french fries with others aren't satisfactory enough. Therefore, you start to design another evil plan.

With some help, you get the information about the plan of French Fries Festival. Formally, the french fries will be given in plates on a long table. And, there are N plates numbered from 1 to N each containing K sticks of french fries.

Then, you come up with your evil plan which contains M stages. For i-th stage, you will choose an interval $[l_i, r_i]$, then you will take some number of sticks of french fries from l_i-th plate to r_i-th plate. Because you want to make your action obscure, you will take equivalent number of sticks of french fries from each plate. Moreover, taking too few number of sticks of french fries makes your action too useless. Thus, you want to take at least a_i sticks of french fries from each plates. But, taking too much french fries is suspicious and is easily discovered by someone. Therefore, you will take at most b_i sticks of french fries from each plates.

Most important thing is that since all the plates contain equal number of french fries at first. You should make sure that after finishing your plan, number of french fries of each plate still remains equal.

After finishing designing your plan, you are wondering whether it's possible to complete your plan. And, if it's possible, you want to find out the maximum number of sticks of french fries you can take.

Input

The first line contains an integer T indicating the total number of test cases. For each test case: First line contains three positive integer N, M, K. Following M lines, each contain 4 positive integers l_i, r_i, a_i, b_i.

- $1 \leq T \leq 100$
- $1 \leq N, M \leq 200$
- $10^6 \leq K \leq 10^9$
- $1 \leq l_i \leq r_i \leq N$
- $0 \leq a_i \leq b_i \leq 1000$

Output

For each test case, please output one line. If it's possible to complete your plan, output the maximum number of sticks of french fries you can take. Otherwise, output `-1`.

Sample Input

```
2
2 2 1000000000
1 1 1 2
2 2 2 3
2 2 1000000000
1 1 1 2
2 2 3 4
```

Sample Output

```
4
-1
```