

Magical Bridges

Hogwarts School of Witchcraft and Wizardry has a circular lane having N towers numbered 1 to N . Towers i and $i+1$ are adjacent to each other for $1 \leq i < N$ and also towers 1 and N are adjacent to each other. Each of these towers has exactly F number of floors, numbered 1,2,3,...,F-1,F from bottom to top. Floors i and $i+1$ in a tower are adjacent to each other and it takes one second to move between them. It also takes one second to move between floor 1 of a tower and floor 1 of its adjacent tower. Apart from these, there are M bridges designed for a quick escape in case of a Death Eater attack, each of which connects two floors of different towers. Each of these bridges is given as $b_i \ f_i \ b_j \ f_j \ t$, meaning it takes t seconds to move along this bridge that connects the floor f_i of tower b_i and the floor f_j of tower b_j . All ways are bidirectional.

Given (q_{b_i}, q_{f_i}) and (q_{b_j}, q_{f_j}) , find the minimum time in seconds it takes to reach floor q_{f_j} of tower q_{b_j} , starting from floor q_{f_i} of tower q_{b_i} . You have to answer a lot of such queries.

Input (STDIN):

The first line contains the number of test cases T . T cases follow. Each test case consists of $N \ F \ M$ in the first line. N is the number of towers, F is the number of floors in each tower and M is the number of bridges. M lines follow, each of the form $b_i \ f_i \ b_j \ f_j \ t$, as mentioned in the problem statement. Next line contains Q , the number of queries and Q lines follow, each of the form $q_{b_i} \ q_{f_i} \ q_{b_j} \ q_{f_j}$.

Output (STDOUT):

For each query of the form $q_{b_i} \ q_{f_i} \ q_{b_j} \ q_{f_j}$, output one line denoting the minimum time in seconds it takes to reach the floor q_{f_j} of tower q_{b_j} , starting from the floor q_{f_i} of tower q_{b_i} .

Constraints:

$$1 \leq T \leq 3$$

$$2 \leq N, M \leq 100$$

$$2 \leq F \leq 1,000,000$$

$$1 \leq t \leq 1,000,000$$

$$1 \leq Q \leq 100,000$$

$$1 \leq b_i, b_j, q_{b_i}, q_{b_j} \leq N$$

$$1 \leq f_i, f_j, q_{f_i}, q_{f_j} \leq F$$

Sample Input:

1

5 4 3

1 3 2 4 3

2 3 3 3 2

3 4 5 3 1

5

1 3 2 3

1 3 3 2

1 1 3 4

3 3 4 4

4 3 4 4

Sample Output:

4

5

4

6

1