D. Wind Turbines

Problem Name	Wind Turbines
Time Limit	4 seconds
Memory Limit	1 gigabyte

Anna has been tasked with designing the wiring for a new offshore wind farm in the North Sea consisting of N turbines, numbered $0, 1, \ldots, N-1$. Her goal is to ensure that all turbines are connected to the shore as cheaply as possible.

Anna has a list of M potential connections, each linking two wind turbines and having a specific cost. Additionally, the nearby city has agreed to cover the costs of connecting a consecutive interval $[\ell, r]$ of turbines to the shore. That is, each turbine t in this range ($\ell \leq t \leq r$) is directly connected to the shore for free. If all potential connections are built, there is a way to reach any wind turbine from any other wind turbine. That implies that as soon as one of the wind turbines is connected to the shore, it is possible to transfer all the power to the shore. Of course, more connections to the shore allows for a cheaper total cost.

It is Anna's job to select a subset of the potential connections in a way that minimizes the sum of their costs, while ensuring that every wind turbine can reach the shore (possibly via other wind turbines).

In order to make an informed decision, the city provides Anna with Q different options for the interval $[\ell, r]$. The city asks Anna to compute the minimum cost for each of these different scenarios.

Input

The first line of the input contains three integers, N, M and Q.

The following M lines contain three integers each, u_i, v_i and c_i. The ith line describes a potential connection between wind turbines u_i and v_i that has the cost c_i. These connections are undirected and connect two different turbines. No two wires connect the same pair of turbines.

The next Q lines contain two integers each, ℓ_i and r_i, describing the scenario where the shore connects to the wind turbines $\ell_i, \ell_i + 1, \ldots, r_i$. Note that we can have $r_i = \ell_i$ when the shore

connects to a single wind turbine. It is guaranteed that, if all potential connections are built, any wind turbine is reachable from any other (directly or indirectly).

Output

Output Q lines, one line per scenario, containing one integer each, the minimum cost of connecting the turbines such that every turbine can deliver its power to the shore.

Constraints and scoring

- $2 \le N \le 100\,000$.
- $1 \le M \le 100\,000$.
- $1 \le Q \le 200\,000$.
- $0 \le u_i, v_i < N - 1$.
- $u_i \ne v_i$, and there is at most one direct connection between each pair of wind turbines.
- $1 \le c_i \le 1\,000\,000\,000$.
- $0 \le \ell_i \le r_i \le N - 1$.

Your solution will be tested on a set of test groups, each worth a number of points. Each test group contains a set of test cases. To get the points for a test group, you need to solve all the test cases in the test group.

Group	Score	Limits
1	8	$M = N - 1$ and the ith edge has $v_i = i$ and $u_i = i + 1$, i.e. the turbines form a path $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow \ldots \leftrightarrow N - 1$
2	11	$N, M, Q \le 2\,000$ and $\sum(r_i - \ell_i + 1) \le 2\,000$
3	13	$r_i = \ell_i + 1$ for all i
4	17	$1 \le c_i \le 2$ for all i, i.e., every connection has costs either 1 or 2
5	16	$\sum(r_i - \ell_i + 1) \le 400\,000$
6	14	$\ell_i = 0$ for all i
7	21	No additional constraints

Examples

In the first example, we are given the following graph.

We are given three queries. In the first query, turbine 1 is the only one with a connection to the shore. In this case, we need to keep all connections except for the connection between turbine 0 and turbine 2, giving a total cost of $2 + 3 + 6 + 3 = 14$. In the next query, the turbines 3 and 4 are

connected to the shore. In this case, we keep the connections $(1, 0)$, $(1, 2)$ and $(2, 4)$, giving a cost of 8. In the third query, all but turbine 0 are connected to the shore. In this case, we only need to connect this one to another turbine, which we do by choosing the connection $(0, 1)$. The solutions to the queries are depicted below:
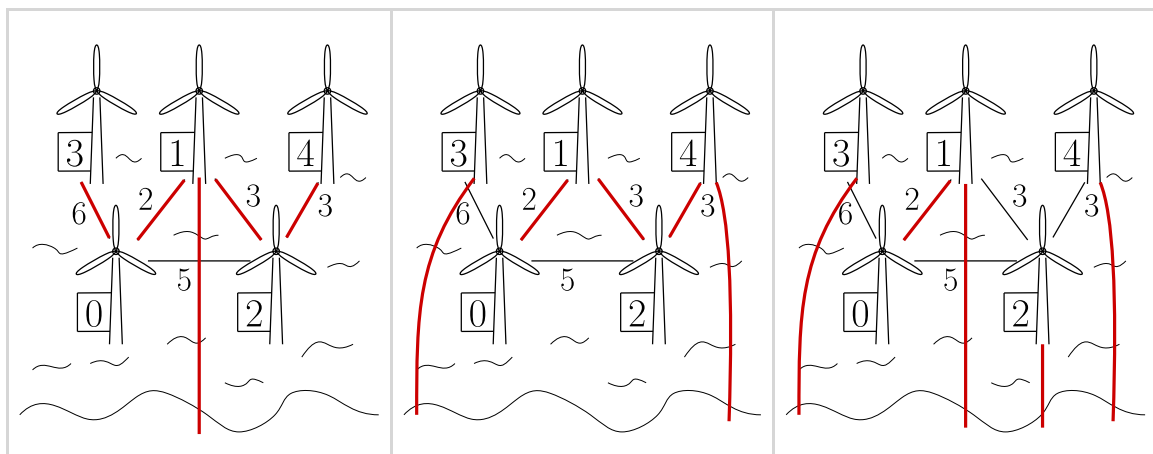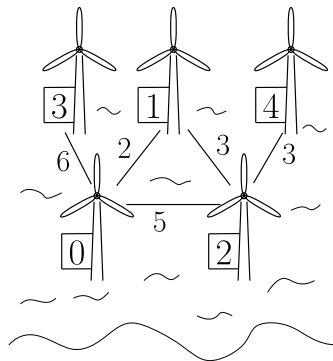
The first and the sixth samples satisfy the constraints of test groups 2, 5 and 7. The second and the seventh samples satisfy the constraints of test groups 1, 2, 5 and 7. The third sample satisfies the constraints of test groups 2, 3, 5 and 7. The fourth sample satisfies the constraints of test groups 2, 4, 5 and 7. The fifth sample satisfies the constraints of test groups 2, 5, 6 and 7.

Input	Output
5 5 3	14
1 0 2	8
0 2 5	2
1 2 3	
3 0 6	
2 4 3	
1 1	
3 4	
1 4	

Input	Output
5 4 4 0 1 3 1 2 1 2 3 5 3 4 2 0 4 2 3 2 4 2 2	0 6 4 11
7 7 4 6 4 3 1 4 5 3 2 4 0 3 2 5 2 3 4 0 1 1 3 1 0 1 2 3 4 5 5 6	12 10 10 10
7 7 3 2 6 1 1 0 1 0 5 1 1 2 2 3 4 1 5 3 1 5 4 1 5 6 1 3 3 4	5 4 6

Input	Output
7 7 4 6 4 3 1 4 5 3 2 4 0 3 2 5 2 3 4 0 1 1 3 1 0 3 0 6 0 1 0 4	7 0 12 6
9 13 4 0 1 1 2 0 3 1 2 4 5 4 4 2 5 6 3 1 7 8 1 4 6 3 9 0 3 5 3 5 3 4 3 2 6 2 4 7 8 5 1 8 4 7 6 7 1 2	1 14 22 24

Input	Output
6 5 1 0 1 1000000000 1 2 1000000000 2 3 1000000000 3 4 1000000000 4 5 1000000000 1 1	5000000000