# Spanning Trees



Let G=(V,E) be a connected, undirected graph. Write an efficient algorithm that computes the following.

- ullet Computes the weight of a minimum spanning tree of G.
- Given a new edge (u,v,w) where  $u,v\in V$  and w is the weight of the edge, compute the minimum spanning tree for the new graph  $G'=(V,E\cup\{(u,v,w)\})$ .

### Input Format

The first line of each test will be three space separated positive integers |V|, |E| and q denoting number of vertices and number of edges in input graph G and the number of queries respectively. Let the vertices of graph G be labelled with  $\{0,\ldots,|V|-1\}$ .

Each of the following |E|+q lines will contain three space separated positive integers u,v and w where (u,v) denotes the edge and w denotes the weight of that edge. The first |E| lines denotes the edge of the original graph whereas the next q lines are the queries.

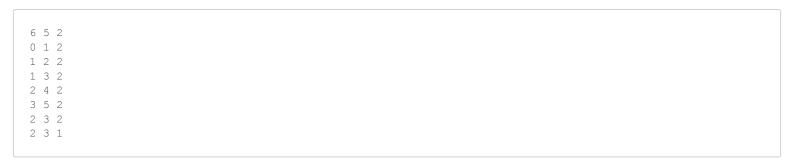
#### **Constraints**

- $1 \le |V| \le 10^4$
- $1 < |E| < 10^2$
- $1 \le q \le 10^8$

## **Output Format**

First, print the weight of a minimum spanning tree of the original graph G=(V,E). For each query u,v,w, print the weight of the minimum spanning tree of  $G'=(V,E\cup\{(u,v,w)\})$ .

#### Sample Input 0



### Sample Output 0

```
10
10
9
```