Traffic Network in Numazu (3s / 256M)

Hanamaru is the mayor of Numazu. She needs to manage the traffic in this city. The traffic network in Numazu is like a tree with an extra edge. To manage the traffic is too hard for her. So she needs your help.

You are given an undirected connected weighted graph with N nodes and N edges, and you have to finish Q missions. Each mission consists of 3 integers OP, X and Y.

When OP=0, you need to modify the length of the X-th road to Y.

When OP=1, you need to calculate the length of the shortest path from node X to node Y.

Input

The first line contains a single integer T, the number of test cases.

Each test case starts with a line containing two integers N and Q, the number of nodes (and edges) and the number of queries. (3 ≤ N ≤ 105) (1 ≤ Q ≤ 105)

Each of the following N lines contain the description of the edges. The i-th line represents the i-th edge, which contains 3 space-separated integers ui, vi, and wi. This means that there is an undirected edge between nodes ui and vi, with a weight of wi. (1 ≤ ui, vi ≤ N) (1 ≤ wi ≤ 105)

Then Q lines follow, the i-th line contains 3 integers OP, X and Y. The meaning has been described above.(0 ≤ OP ≤ 1)(1 ≤ X ≤ 105) (1 ≤ Y ≤ 105)

It is guaranteed that the graph contains no self loops or multiple edges.

Output

For each test case, and for each mission whose OP=1, print one line containing one integer, the shortest path between X and Y.

Example

|  |  |
| --- | --- |
| standard input | standard output |
| 2  5 5  1 2 3  2 3 5  2 4 5  2 5 1  4 3 3  0 1 5  1 3 2  1 5 4  0 5 4  1 5 1  5 3  1 2 3  1 3 2  3 4 4  4 5 5  2 5 5  0 1 3  0 4 1  1 1 4 | 5  6  6  6 |