

Problem E. Just Do It

Time limit 4500 ms
Memory limit 512MB

Problem Description

Give you a connected graph with n vertices and n weighted edges. Answer the minimal distances for Q pairs (u, v) .

By the way, in some queries, you may be asked to adjust the weight of an edge.

Input format

The first line contains two integers n and Q , the number of vertices/edges and the number of queries. ($4 \leq n, Q \leq 3 \times 10^5$)

For the next n lines, the i -th line contain three integers u_i, v_i, w_i , meaning that there is an edges between u_i and v_i with weight w_i . ($1 \leq u_i, v_i \leq n$; $1 \leq w_i \leq 10^9$)

For the last Q lines, there are two types of query:

- "1 $x\ y\ c$ ": **add** c to the weight of the edge between x and y . It's guaranteed that there is an edge between x and y . Moreover, we promise that the weight will fall in $[1, 10^9]$ after change. ($1 \leq x, y \leq n$; $-10^9 \leq c \leq 10^9$)
- "2 $u\ v$ ": answer the minimal distance of u and v . ($1 \leq u, v \leq n$)

The given graph is connected.

Output format

For each query with type 2, output one integer.

Subtask score

Subtask	Score	Additional Constraints
1	7	$n, Q \leq 1000$; no query of type 1.
2	11	$n, Q \leq 1000$
3	8	The degree for all vertices is 2; no query of type 1.
4	12	The degree for all vertices is 2.
5	12	$w_i = 1$; no query of type 1.
6	18	no query of type 1.
7	32	No constraints

Sample

Sample Input 1

```
7 3
1 2 8
6 1 3
2 6 6
7 4 9
3 1 4
4 6 10
5 3 9
2 5 7
1 1 6 1
2 3 7
```

Sample Output 1

```
35
27
```

Sample Input 2

```
9 4
1 3 3
4 3 1
5 3 3
3 8 8
3 6 5
9 1 7
7 1 2
2 6 7
8 2 8
2 1 3
2 2 8
2 2 9
2 7 8
```

Sample Output 2

```
3
8
22
13
```

Sample Input 3

```
5 2
1 4 12
2 5 12
4 3 5
3 2 11
5 1 15
2 2 3
2 4 5
```

Sample Output 3

```
11
27
```

Notes