



Not more than 3

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✔ Points: 100 (partial)

② Time limit: 1.0s

■ Memory limit: 256M

Author: admin

- > Problem type
- ➤ Allowed languages C, C++

Problem Statement

You are given an **undirected** graph with n vertices and m edges. The vertices are numbered from 1 to n, and for each i $(1 \le i \le m)$ the i^{th} edge is between vertex u_i and v_i and has a length w_i .

Your task is to find the lengths of the **shortest paths** from vertex 1 to *all* the vertices. However, there is a catch. In any path that is taken to reach any vertex from 1, the **number of consecutive even or odd vertices encountered cannot exceed 3**. If it is not possible to reach a particular vertex under this constraint, output -1 for that vertex.

Input Format

The first line of input contains two integers n and m denoting the number of vertices and edges respectively.

Each of the next m lines contains three integers u_i , v_i and w_i representing an edge between these two vertices and the length of the edge.

Constraints

 $1 \le n \le 100,000$

 $1 \le m \le 200,000$

 $1 \leq u_i, v_i \leq n$

 $1 \le w_i \le 1,000,000,000$

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Print n integers, the lengths of the **shortest paths** to all vertices from vertex 1, following the condition mentioned above.

Sample Test Case 0:

Input:

```
Copy

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

Output:

```
0 12 2 15 5 16 17
```

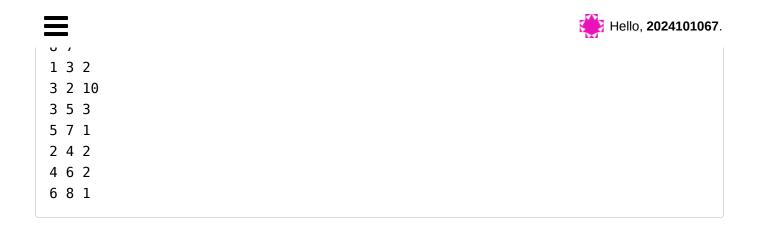
Explanation:

Main observation is that to get to vertex 7, while normally shortest length would be 6, this time we will have to take the path 1 -> 3 -> 2 -> 4 -> 6 -> 7, which gives length as 17. The other lengths can also be checked similarly.

Sample Test Case 1:

Input:

Conv



Output:

```
0 12 2 14 5 16 26 -1
```

Explanation:

In order to get to vertex 7, while normally shortest length would be 6, this time we will have to take the path 1 - 3 -> 2 -> 3 -> 5 -> 7, which gives length as 26. The other lengths can also be checked similarly. Note, that it is impossible to reach vertex 8 as the only path to it already has three even numbers.

```
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1 - 3 - 2 - 4 - 6 - 8

| 5
| 7
```

Sample Test Case 2:

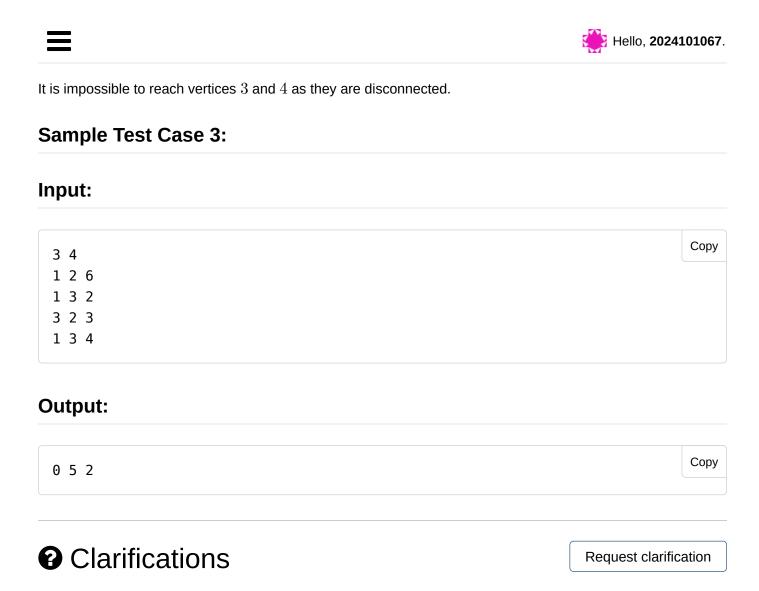
Input:

```
4 1
1 2 3
```

Output:

```
0 3 -1 -1 Copy
```

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No clarifications have been made at this time.

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