

Dijkstra!

Time Limit: 1 Second
Memory Limit: 2048 MB

Given a directed graph G with n vertices and m edges ($1 \leq n, m \leq 10^5$). For each vertex $v = 1 \dots n$, calculate the distance from vertex 1 to v . If v is not reachable from 1, output -1 .

Input

The first line of input contains two integers n and m ($1 \leq n, m \leq 10^5$) - the number of vertices and edges.

The next m lines describe the graph. The i -th line contains three integers u_i , v_i , and w_i ($1 \leq u_i, v_i \leq n$, $1 \leq w_i \leq 10^5$), denoting there is an edge from u_i to v_i in G with weight w_i . It is guaranteed that the graph doesn't contain self-loops or multiple edges.

Output

Output one line with n integers denoting the distance from vertex 1 to each vertex in G , or -1 if the vertex is unreachable from 1.

Sample Inputs

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

Sample Outputs

```
0 2 5 -1 9
```
