Problem B - Revuocnav

Time limit: 1 second

Jack's twin step-brother Toby keeps up-to-date on the latest bagel news. Whenever a new bagel is invented, he has to be the first to try it. All the bagel shops in Toby's hometown of Revuocnav are at intersections. Therefore, he needs to know the shortest route from his house to any intersection.

Revuocnav has n intersections labelled from 1 to n, and m roads between intersections. It takes Toby c_i seconds to travel along the ith road. Toby lives at intersection s. Since Toby is a fast driver, it doesn't take him any extra time to travel through an intersection.

Input

The first line contains two integers n, m ($1 \leq n, m \leq 2 \cdot 10^5$): the number of intersections and roads, respectively. The second line contains one integer s ($1 \leq s \leq n$): The intersection where Toby lives. The next m lines each contain 3 integers u_i, v_i, c_i ($1 \leq u, v_i \leq n, 0 \leq c_i \leq 10^9$), indicating that there is a road between the intersections u_i and v_i that takes c_i time to traverse.

Output

Output n integers separated by spaces. The ith integer is the shortest amount of time it will take to travel from intersection s to intersection i, or -1 if there is no path.

Sample Input

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

Sample Output

```
0 1 3 2 7 8 -1
```