G is a simple n-node m-edge directed graph. Each edge in G has an integral weight $\omega(e)$. It is guaranteed that G has a **unique** negative-weight simple cycle C, i.e.

$$\sum_{e \in C} \omega(e) < 0.$$

Given a source node $s \in G$, output the distance from s to C. The **distance** from s to C is defined to be the minimum number of directed edges in a path from s to any node in C. If s is a node in C, then the distance is 0. If C is not reachable from s, then the distance is ∞.

Hint

Some shortest path algorithm can detect the existence of negative cycles.

Input

The first line contains n, m, and s, where:

- n is an integer in $[4, 10^3]$,
- m is an integer in $[n-1, (n-1)\sqrt{n}/2]$, and
- s is an integer in $[1, n]$.

Each of subsequent m lines contains three integers u, v, $\omega(u, v)$ indicating that G has an directed edge $(u \to v)$ with weight $\omega(u, v)$. Note that we label each node in G with a unique number in $\{1, 2, \ldots, n\}$, and thus u and v are integers in $[1, n]$. Each edge weight $\omega(u, v)$ is an integer in $[-1000, 1000]$.

Output

The distance from the node with label s to the unique negative cycle C. If the distance is ∞, output -1.

Sample Input

```
4 5 2
3 2 3
2 1 3
3 1 3
1 4 3
4 3 -9
```

Sample Output

```
1
```