E. The Classic Problem

time limit per test: 5 seconds
memory limit per test: 768 megabytes
input: standard input
output: standard output

You are given a weighted undirected graph on n vertices and m edges. Find the shortest path from vertex s to vertex t or else state that such path doesn't exist.

Input

The first line of the input contains two space-separated integers — n and m ($1 \le n \le 10^5$; $0 \le m \le 10^5$).

Next m lines contain the description of the graph edges. The i-th line contains three space-separated integers — u_i, v_i, x_i ($1 \le u_i, v_i \le n$; $0 \le x_i \le 10^5$). **That means that vertices with numbers u_i and v_i are connected by edge of length 2^{x_i} (2 to the power of x_i).**

The last line contains two space-separated integers — the numbers of vertices s and t.

The vertices are numbered from 1 to n. The graph contains no multiple edges and self-loops.

Output

In the first line print the remainder after dividing the length of the shortest path by 1000000007 $(10^9 + 7)$ if the path exists, and `-1` if the path doesn't exist.

If the path exists print in the second line integer k — the number of vertices in the shortest path from vertex s to vertex t; in the third line print k space-separated integers — the vertices of the shortest path in the visiting order. The first vertex should be vertex s, the last vertex should be vertex t. If there are multiple shortest paths, print any of them.

Examples

input

```
4 4
1 4 2
1 2 0
2 3 0
3 4 0
1 4
```

output

```
3
4
1 2 3 4
```

input

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

output

```
112
4
1 2 3 4
```

input

```
4 2
1 2 0
```

```
3 4 1
1 4
```

output

```
-1
```

Note

A path from vertex s to vertex t is a sequence v_0, ..., v_k, such that $v_0 = s$, $v_k = t$, and for any i from 0 to $k - 1$ vertices v_i and v_{i+1} are connected by an edge.

The length of the path is the sum of weights of edges between v_i and v_{i+1} for all i from 0 to $k - 1$.

The shortest path from s to t is the path which length is minimum among all possible paths from s to t.