D. Presents in Bankopolis

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Bankopolis is an incredible city in which all the n crossroads are located on a straight line and numbered from 1 to n along it. On each crossroad there is a bank office.

The crossroads are connected with m oriented bicycle lanes (the i-th lane goes from crossroad u_i to crossroad v_i), the difficulty of each of the lanes is known.

Oleg the bank client wants to gift happiness and joy to the bank employees. He wants to visit exactly k offices, in each of them he wants to gift presents to the employees.

The problem is that Oleg don't want to see the reaction on his gifts, so he can't use a bicycle lane which passes near the office in which he has already presented his gifts (formally, the i-th lane passes near the office on the x-th crossroad if and only if $min(u_i, v_i) < x < max(u_i, v_i)$). Of course, in each of the offices Oleg can present gifts exactly once. Oleg is going to use exactly k - 1 bicycle lane to move between offices. Oleg can start his path from any office and finish it in any office.

Oleg wants to choose such a path among possible ones that the total difficulty of the lanes he will use is minimum possible. Find this minimum possible total difficulty.

Input

The first line contains two integers n and k ($1 \le n, k \le 80$) — the number of crossroads (and offices) and the number of offices Oleg wants to visit.

The second line contains single integer m ($0 \le m \le 2000$) — the number of bicycle lanes in Bankopolis.

The next m lines contain information about the lanes.

The i-th of these lines contains three integers u_i, v_i and c_i ($1 \le u_i, v_i \le n$, $1 \le c_i \le 1000$), denoting the crossroads connected by the i-th road and its difficulty.

Output

In the only line print the minimum possible total difficulty of the lanes in a valid path, or `-1` if there are no valid paths.

Examples

input
7 4 4 1 6 2 6 2 2 2 4 2 2 7 1
output
6

input
4 3 4 2 1 2 1 3 2 3 4 2 4 1 1

output
3

Note

In the first example Oleg visiting banks by path $1 \to 6 \to 2 \to 4$.

Path $1 \to 6 \to 2 \to 7$ with smaller difficulity is incorrect because crossroad $2 \to 7$ passes near already visited office on the crossroad 6.

In the second example Oleg can visit banks by path $4 \to 1 \to 3$.