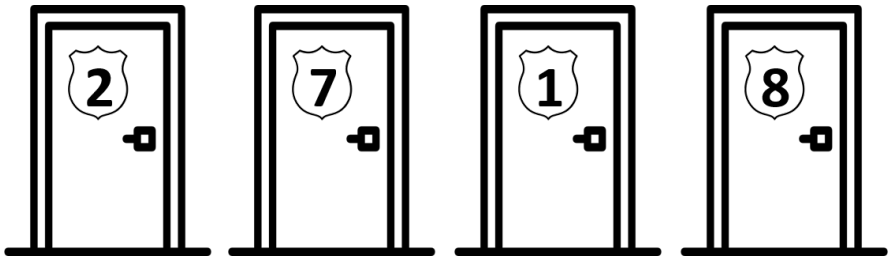
Problem G — limit 3 seconds

Security Badge



You are in charge of the security for a large building, with n rooms and m doors between the rooms. The rooms and doors are conveniently numbered from 1 to n, and from 1 to m, respectively.

Door i opens from room a_i to room b_i, but not the other way around. Additionally, each door has a security code that can be represented as a range of numbers $[c_i, d_i]$.

There are k employees working in the building, each carrying a security badge with a unique, integer-valued badge ID between 1 and k. An employee is cleared to go through door i only when the badge ID x satisfies $c_i \leq x \leq d_i$.

Your boss wants a quick check of the security of the building. Given s and t, how many employees can go from room s to room t?

Input

The first line of input contains three space-separated integers n, m, and k ($2 \leq n \leq 1{,}000$; $1 \leq m \leq 5{,}000$; $1 \leq k \leq 10^9$).

The second line of input contains two space-separated integers s and t ($1 \leq s, t \leq n$; $s \neq t$).

Each of the next m lines contains four space-separated integers a_i, b_i, c_i, and d_i ($1 \leq a_i, b_i \leq n$; $1 \leq c_i \leq d_i \leq k; a_i \neq b_i$), describing door i.

For any given pair of rooms a, b there will be at most one door from a to b (but there may be both a door from a to b and a door from b to a).

Output

Print, on a single line, the number of employees who can reach room t starting from room s.

Sample Input and Output

4 5 10 3 2 1 2 4 7 3 1 1 6 3 4 7 10 2 4 3 5 4 2 8 9	5

4 5 9 1 4 1 2 3 5 1 3 6 7 1 4 2 3 2 4 4 6 3 4 7 9	5