Security Badges

You are in charge of the security for a large building. The building has a map, consisting of rooms, and doors between the rooms. Each door has a security code, which consists of a range of numbers, specified by a lower bound and an upper bound. Each employee has a uniquely numbered security badge. Only a security badge with a number within a door's range can go through that door.

Your boss wants a quick check of the security of the building. Given a starting room and a destination room, how many security badge numbers can go from the start to the destination?

Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs. Each test case will begin with a line containing three integers integer n ($1 \le n \le 1{,}000$), m ($1 \le m \le 5{,}000$) and k ($1 \le k \le 10^9$), where n is the number of rooms, m is the number of doors, and k is the number of badges. The rooms are numbered $1..n$ and the badges are numbered $1..k$.

The next line will contain two integers, s and d ($1 \le s,d \le n$), which indicate the starting room and destination room.

Each of the next m lines will contain four integers, a, b ($1 \le a,b \le n$, $a \ne b$), min and max ($1 \le min \le max \le k$) describing a door, where the door from room a to room b (and not back), and the badges range for the door is $min..max$, inclusive.

Output

Output a single integer, which is the number of badges that can go from the start room to the destination room.

Sample Input	Sample 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