Researchers

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	512 megabytes

A group of researchers have discovered an unknown planet in our galaxy.

They are studying the ancient civilization that lived on this planet. It is known that there were n cities. There were also m two-way roads between these cities. Each road existed for a certain period of time. The i-th road connected the cities a_i and b_i only in the period from c_i-th to d_i-th year, inclusive. It is possible that a pair of cities could be connected with multiple roads in one year.

The researchers had q questions. Each question was to determine how many k existed in the interval from l_i to r_i inclusive, that it was possible to walk from the city x_i to the city y_i along the roads that existed in the year k. Help the researchers find the answer to each of these questions.

Input

The first line of the input file contains two integers n and m ($2 \le n \le 77777$, $1 \le m \le 77777$) — the number of cities and the number of two-way roads.

The next m lines contain four integers a_i, b_i, c_i and d_i ($1 \le a_i, b_i \le n, a_i \ne b_i$, $1 \le c_i \le d_i \le 10^9$) — numbers of cities connected by the i-th road and the interval of years in which this road existed.

The next line contains one integer q ($1 \le q \le 77777$) — the number of questions.

The next q lines contain four integers x_i, y_i, l_i and r_i ($1 \le x_i, y_i \le n, x_i \ne y_i$, $1 \le l_i \le r_i \le 10^9$) — numbers of cities and interval of years of the i-th question.

Output

Print exactly q numbers on separate lines. In the i-th of them print the number of values k between l_i to r_i, inclusive, that it was possible to get from the city x_i to the city y_i along the roads that existed in the year k.

Scoring

This task contains 7 subtasks.

Subtask	Additional restrictions	Points	Required subtasks
0	Examples	0	—
1	$n, m, q \le 100$, $d_i \le 100$, $r_i \le 100$	5	0
2	$n, m, q \le 3000$, $d_i \le 3000$, $r_i \le 3000$	7	1
3	$m = n - 1$, $a_i = i$, $b_i = i + 1$	12	—
4	$d_i = 10^9$	16	—
5	$l_i = r_i$	12	—
6	$n, m, q \le 40000$	27	2
7	—	21	3, 4, 5, 6

Example

standard input	standard output
4 4 1 2 2 5 2 3 1 4 3 4 2 3 4 2 4 4 3 1 3 1 5 4 2 2 4 1 4 3 6	3 3 2

Note

Consider the example. In the second year there were roads $1-2$, $2-3$ and $3-4$. Therefore, this year it was possible to get from any city to any other.

There was no direct road between the pair of cities 1 and 3, but it was possible to get from one to the other along the route $1-2-3$ in the second, third and fourth years.

Between the pair of cities 4 and 2 there was a path along the route $4-3-2$ in the second and third years, and in the fourth year there was a direct road between them.