E. Bipartite Segments

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

You are given an undirected graph with n vertices. There are no edge-simple cycles with the even length in it. In other words, there are no cycles of even length that pass each edge at most once. Let's enumerate vertices from 1 to n.

You have to answer q queries. Each query is described by a segment of vertices $[l; r]$, and you have to count the number of its subsegments $[x; y]$ ($l \le x \le y \le r$), such that if we delete all vertices except the segment of vertices $[x; y]$ (including x and y) and edges between them, the resulting graph is bipartite.

Input

The first line contains two integers n and m ($1 \le n \le 3 \cdot 10^5$, $1 \le m \le 3 \cdot 10^5$) — the number of vertices and the number of edges in the graph.

The next m lines describe edges in the graph. The i-th of these lines contains two integers a_i and b_i ($1 \le a_i, b_i \le n$; $a_i \ne b_i$), denoting an edge between vertices a_i and b_i. It is guaranteed that this graph does not contain edge-simple cycles of even length.

The next line contains a single integer q ($1 \le q \le 3 \cdot 10^5$) — the number of queries.

The next q lines contain queries. The i-th of these lines contains two integers l_i and r_i ($1 \le l_i \le r_i \le n$) — the query parameters.

Output

Print q numbers, each in new line: the i-th of them should be the number of subsegments $[x; y]$ ($l_i \le x \le y \le r_i$), such that the graph that only includes vertices from segment $[x; y]$ and edges between them is bipartite.

Examples

input

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

output

```
5
5
14
```

input

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

```
8 4
7 2
3
1 8
1 4
3 8
```

output

```
27
8
19
```

Note

The first example is shown on the picture below:

For the first query, all subsegments of $[1; 3]$, except this segment itself, are suitable.

For the first query, all subsegments of $[4; 6]$, except this segment itself, are suitable.

For the third query, all subsegments of $[1; 6]$ are suitable, except $[1; 3]$, $[1; 4]$, $[1; 5]$, $[1; 6]$, $[2; 6]$, $[3; 6]$, $[4; 6]$.

The second example is shown on the picture below: