E. Cactus

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

A connected undirected graph is called a vertex cactus, if each vertex of this graph belongs to at most one simple cycle.

A *simple cycle* in a undirected graph is a sequence of distinct vertices $v_1, v_2, ..., v_t$ $(t > 2)$, such that for any i $(1 \le i < t)$ exists an edge between vertices v_i and v_{i+1}, and also exists an edge between vertices v_1 and v_t.

A *simple path* in a undirected graph is a sequence of not necessarily distinct vertices $v_1, v_2, ..., v_t$ $(t > 0)$, such that for any i $(1 \le i < t)$ exists an edge between vertices v_i and v_{i+1} and furthermore each **edge occurs no more than once**. We'll say that a simple path $v_1, v_2, ..., v_t$ starts at vertex v_1 and ends at vertex v_t.

You've got a graph consisting of n vertices and m edges, that is a vertex cactus. Also, you've got a list of k pairs of interesting vertices x_i, y_i, for which you want to know the following information — the number of distinct simple paths that start at vertex x_i and end at vertex y_i. We will consider two simple paths distinct if the sets of edges of the paths are distinct.

For each pair of interesting vertices count the number of distinct simple paths between them. As this number can be rather large, you should calculate it modulo 1000000007 $(10^9 + 7)$.

Input

The first line contains two space-separated integers n, m $(2 \le n \le 10^5; 1 \le m \le 10^5)$ — the number of vertices and edges in the graph, correspondingly. Next m lines contain the description of the edges: the i-th line contains two space-separated integers a_i, b_i $(1 \le a_i, b_i \le n)$ — the indexes of the vertices connected by the i-th edge.

The next line contains a single integer k $(1 \le k \le 10^5)$ — the number of pairs of interesting vertices. Next k lines contain the list of pairs of interesting vertices: the i-th line contains two space-separated numbers x_i, y_i $(1 \le x_i, y_i \le n; x_i \ne y_i)$ — the indexes of interesting vertices in the i-th pair.

It is guaranteed that the given graph is a vertex cactus. It is guaranteed that the graph contains no loops or multiple edges. Consider the graph vertices are numbered from 1 to n.

Output

Print k lines: in the i-th line print a single integer — the number of distinct simple ways, starting at x_i and ending at y_i, modulo 1000000007 $(10^9 + 7)$.

Examples

input

```
10 11
1 2
2 3
3 4
1 4
3 5
5 6
8 6
8 7
7 6
7 9
9 10
6
1 2
3 5
6 9
9 2
```

```
9 3
9 10
```

output

```
2
2
2
4
4
1
```