

Problem F. The Kth Largest Value

Description

Given a directed graph with n vertices and m edges, pair (u,v) is good if and only if there is a path from vertex u to vertex v . Obviously, pair (u,u) is also good.

The value of a good pair (u,v) equals to $u \text{ xor } v$. Xor here refers to bitwise operation *Exclusive Or*.

We will query Q times. Each time we give an integer K , please print the K^{th} largest value among all the good pairs.

Input

The first line of input is an integer $T(1 \leq T \leq 3)$, the number of test cases.

For each test case:

The first line contains three integers $n(1 \leq n \leq 50000)$, $m(1 \leq m \leq 200000)$ and $Q(1 \leq Q \leq 10)$, meaning that there are n vertices and m edges in the graph, and there are Q queries

Then m lines follow. Each line includes two integers u and $v(1 \leq u, v \leq n)$, standing for a directed edge from u to v . The graph won't contain multiple edges between the same pair of vertices.

Then Q lines follow. Each line includes an integer, above mentioned $K(1 \leq K \leq 10^9)$.

It is guaranteed that the answer always exists.

Output

For each test case, print the K^{th} largest value of all good pairs.

Sample Input

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

1
3
5
7
9

Sample Output

3
2
1
7
7
6
5
4