Problem F. The K^{th} 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 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 <= T <= 3) , the number of test cases.

For each test case:

The first line contains three integers n(1<= n <= 50000) ,m(1 <= m <= 200000) and Q(1 <= Q <= 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 <=u , v <= 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 <= K <= 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