

1412 – Visiting Islands

There are N islands and M bridges. All the bridges are setup between two islands and to pass a bridge you have to give a toll of \$1. The bridges are built in such a way that there is not more than one path among two islands. Now, you want to visit at least K different islands. You may choose the starting island of your choice, but you want to visit at least K different islands in minimum cost (starting island is considered to be already visited).

Input

Input starts with an integer T (≤ 10), denoting the number of test cases.

Each case starts with two integers N, M ($1 \leq N \leq 10^5, 0 \leq M < N$). Each of the next M lines contains two integers u, v ($1 \leq u, v \leq N, u \neq v$) meaning that there is a bridge between island u and v . No bridge will be reported more than once.

The next line contains an integer q ($1 \leq q \leq 50000$) denoting the number of queries. Each of the next q lines contains one integer K ($1 \leq K \leq 10^5$).

Output

For each case, print the case number first. Then for each query, print the minimum amount of toll you need to pay to visit at least K different islands. If it is not possible, print "impossible".

Sample Input	Output for Sample Input
2	Case 1:
2 1	0
1 2	1
3	impossible
1	Case 2:
2	2
3	1
5 4	
1 2	
2 3	
2 4	
2 5	
2	
3	
2	

Notes

1. Dataset is huge, use faster I/O methods.
2. For the first case, for $K = 1$, which ever island we start with, we visit this. So without giving any toll we can visit one island. For $K = 2$, we choose island 1 to start. So we visit island 2 using the only bridge. So it costs \$1. For $K = 3$, as there are only 2 islands in total so we cannot visit 3 islands.