

# 11165 Galactic Travel

*Thanks to the Interstate Highway System, it is now possible to travel from coast to coast without seeing anything.*

Charles Kuralt

The problem is simple: there are  $n$  planets in the galaxy that have human settlements on them. Each planet has a hyperspace jump gate that allows a space ship to teleport from some planet  $U$  to some planet  $V$ . For technical reasons, not all of the  $n(n - 1)$  jumps are allowed. What is the smallest number of jumps that are required to reach planet  $T$  from planet  $S$ ?

### Input

The first line of input gives the number of cases,  $N$ .  $N$  test cases follow. Each one starts with two lines containing  $n$  ( $1 \leq n \leq 100,000$ ) and  $k$  ( $0 \leq k \leq 41,000$ ). The next  $k$  lines will each be of the form

$U \ V1-V2$

meaning that the jumps from planet  $U$  to planets  $V1$  through  $V2$  (inclusive) are forbidden. Finally, the last line will contain  $S$  and  $T$ . Vertices are numbered from 0 to  $n - 1$ . The number of different forbidden pairs will be no larger than 5,000,000.

### Output

For each test case, output one line containing 'Case # $x$ :' followed by either the minimum number of jumps, or 'Impossible'.

### Sample Input

```

4
3
1
0 2-2
0 2
3
1
0 1-2
0 2
4
4
0 0-3
1 0-3
2 0-3
3 0-3
0 0
100000
3
0 1-99998
99999 1-50000

```

99999 50002-99999

0 1

### Sample Output

Case #1: 2

Case #2: Impossible

Case #3: 0

Case #4: 3