

# Roads of NITT

The Institute of NITT believes in frugality. So when they made the plan for interconnecting the  $N$  hostels, they decided to construct as few bidirectional roads as possible. The hostels are interconnected with roads in such a way that every pair of hostels is connected by exactly one path.

Moreover, they were so frugal that they used low quality tar in making the roads. As a result, the roads start to crack and cannot be used anymore.

Now Alpa has a set of queries. At the time of each query, he knows the roads that are un-usable. He wants to find the number of pairs of hostels that are disconnected, i.e, the number of pairs  $(x,y)$  such that  $1 \leq x < y \leq N$  and there exists no path between hostels  $x$  and  $y$ .

Help him find the result for each query.

## Constraints:

Test cases  $\leq 5$

No. of hostels,  $N \leq 20000$

No. of queries,  $Q \leq 20000$

## Input

First line contains  $t$ , the total test cases.

Each test case looks as follows:

First line contains  $N$ , total number of hostels.

Next  $N - 1$  lines contain two integers  $x$  and  $y$ , indicating that there is a road between  $x$  and  $y$ . ( $1 \leq x < y \leq N$ ). The roads are numbered from 1 to  $N - 1$ .

Next line contains  $Q$ , total number of queries.

Next  $Q$  lines contain the  $Q$  queries.

Each query may be of the following two forms:

R x - Remove the road numbered x. It is guaranteed that this road exists and hasn't already been removed.

Q - Output the total number of pairs (x, y) such that  $1 \leq x < y \leq N$  and there exists no path between hostels x and y.

## Output

For each test case,

Output a line for each query with the required value.

Print a blank line after each test case.

## Example

### Input:

```
2
3
1 2
1 3
5
Q
R 1
Q
R 2
Q
4
1 2
1 3
1 4
7
Q
R 1
Q
R 2
Q
R 3
Q
```

### Output:

```
0
2
3
```

```
0
3
5
6
```