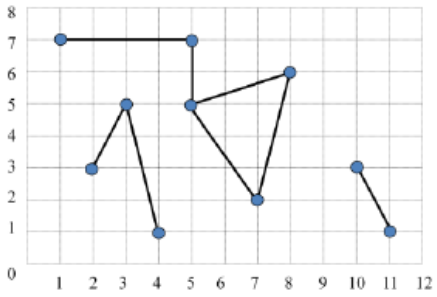
1455 Kingdom

There were n cities in an ancient kingdom. In the beginning of the kingdom, all cities were isolated. Kings ordered their subjects to construct roads connecting cities. A lot of roads were built with time. Every road was always constructed along the line segment between two cities. All cities are partitioned into disjoint components of cities by road-connectivity. A connected component of cities was called a state. A state consists of cities and roads connecting them.

A historical record tells a time sequence of road constructions in order. A road connecting two cities A and B doesn't intersect with other roads at a point except for A and B. Before construction, A and B may have belonged to the same state or different states. After construction, A and B would belong to a same state, i.e., two states would merge into a state if needed.

Prof. Kim, a historian, is concerned about the following question: How many states does a horizontal line (corresponding to the latitude of a specific place) pass by at a moment of the past? The figure on the right shows an example of a configuration of roads at some moment. A circle represents a city and a line segment represents a road between two cities. There are 3 states. A line with y = 4.5 passes by two states with total 8 cities and a line with y = 6.5 passes by one state with 5 cities.



You are to write a program which handles the following two types of commands:

- `road` A B

  A road between two cities A and B will be constructed. The road doesn't intersect with other roads at a point except for A and B. This is an informative command and your program does not need to respond.

- `line` C

  This is a query. The program should output the number of states which a line $y = C$ passes by and the total number of cities of them.

Input

Your program is to read from standard input. The input consists of T test cases. The number of test cases T is given in the first line of the input. The first line of each test case contains an integer n, the number of cities, where $1 \leq n \leq 100,000$. Each of the following n lines contains two integers x and y $(0 \leq x, y \leq 1,000,000)$, where (x, y) represents the coordinate of a city. There is a single space between the integers. The cities are numbered from 0 to $n - 1$ in order. The next line contains an integer m, the number of commands, where $1 \leq m \leq 200,000$. Each of the following m lines contains a command, either '`road` A B' or '`line` C', where $0 \leq A \neq B < n$ and C $(0 < C < 1,000,000)$ is a real number of which the fractional part is always 0.5. There exists at most one road construction connecting a pair of cities and there exists at least one query per a test case.

Output

Your program is to write to standard output. Print exactly one line for a query through all test cases. The line should contain two integers which represent the number of states and the total number of cities of them respectively.

Sample Input

```
3
10
1 7
5 7
8 6
3 5
5 5
2 3
10 3
7 2
4 1
11 1
11
road 0 1
road 3 5
line 6.5
road 4 2
road 3 8
road 4 7
road 6 9
road 4 1
road 2 7
line 4.5
line 6.5
1
100 100
1
line 100.5
2
10 10
20 20
2
road 0 1
line 15.5
```

Sample Output

```
0 0
2 8
1 5
0 0
1 2
```