Highway Traffic

The Federal Roads Office is working on a new traffic monitoring and alerting system. The idea is to publish a minute-by-minute report of the stretches of roads that are particularly congested with traffic. According to the Federal Road Office, a point on a road is considered congested if it is within the safety distance of at least 3 vehicles. Trucks have a safety distance of 100 meters. Cars have a safety distance of 50 meters. Fortunately—at least according to the Federal Roads Office—cars and trucks these days are equipped with a tracking device that reports their position. The Office also has a system that conveniently transforms every position report into a longitudinal position along the road where the vehicle is driving. So, you can think of the road as a straight line in which vehicle positions are given as an x coordinate. You must develop a program that, given the positions of a set of cars and trucks on a road, determines which segments of the road are congested.

Input

The first line contains the number of vehicles n with $1 \leq n \leq 10^5$. Each of the following n lines contains a single character v, either `C` or `T` indicating whether the vehicle is a car or truck, and an integer x, with $-10^9 \leq x \leq 10^9$, indicating the position of the vehicle on the road. Roads have multiple lanes, so there could be two or more vehicles in the same position.

Output

Print the congested segments of the road. A single point does not count as a segment and the segments must be disjoint. Print a segment as two integers l r, with $l < r$ representing the coordinates of the left and right bounding points of the segment. The segments must be sorted from left to right.

Examples

Sample input 1

```
4
C 85
T 20
C 55
C 180
```

Sample output 1

```
35 105
```

Sample input 2

```
7
C 1
C 30
C -20
T 160
C 45
C -50
C 130
```

Sample output 2

```
-49 51
60 95
```

Limits

Time limit is 3 seconds.

Memory limit is 1024 megabytes.