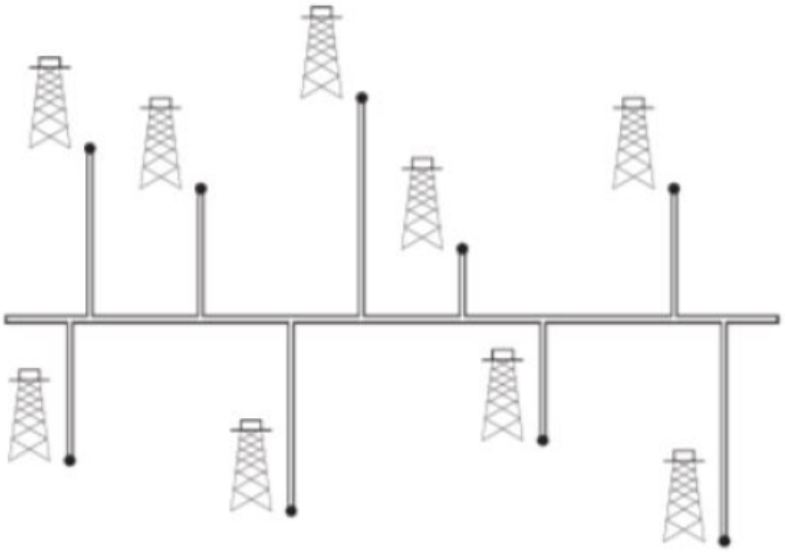
Problem F
Oil Pipeline

Time limit: **1 second**
Memory limit: **1024 megabytes**

Problem Description

Professor Olay is consulting for an oil company, which is planning a large pipeline running east to west through an oil field of n wells. The company wants to connect a spur pipeline from each well directly to the main pipeline along a shortest route (either north or south), as shows in the following figure. Given the x- and y-coordinates of the wells, how should the professor pick the optimal location of the main pipeline, which would be the one that minimizes the total length of the spurs?



Input Format

The input contains several test cases. Every test case begins with a line that contains a single integer N: The total number of wells. Each of the following N lines contains two integers x_i and y_i, separated by a space, which x_i and y_i indicated the x- and y-coordinates of the i-th well, respectively. The Input file will be terminated by a line consisting of a single '`0`'.

Output Format

For each test case, output two single integers w and sum, which w denotes as the optimal location of the main pipeline, and sum denotes as the total distance between wells and main pipeline. If there is not only one solution, please output the minimum of solutions.

Technical Specification

- $1 \leq N \leq 10^5$
- $1 \leq i \leq N$

- $1 \leq x_i, y_i \leq 1,000$

Sample Input 1

```
5
1 2
3 4
5 6
7 8
9 10
0
```

Sample Output 1

```
6 12
```