Algorithmen und Wahrscheinlichkeit
Programming Exercises

Exercise – *City Planning*

You are a consultant for the construction company building new roads in the AlgoCity. The plans have been set, the works are just about to begin. The last measurement that needs to be computed in order to see that everything is perfectly planned, is the sum of all pairwise Manhattan distances between the crossroads. This is where you algorithms skills are put to the test.

Input   The first line of the input file contains a number $t \leq 30$ of test cases. Each of the t test cases is described as follows.

- It starts with a line which consists an integer n, denoting the number of crossroads in the city ($1 \leq n \leq 10^4$).

- The following n lines describe the crossroads. The ith line consists of two integers x y, separated by a space, denoting the position of the ith crossroad ($-1000 \leq x, y \leq 1000$).

Output   For each test case output a single integer denoting the sum of all pairwise Manhattan distances between the crossroads.

Note: Recall, the Manhattan distance between two points (x_1, y_1) and (x_2, y_2) is defined as $|x_1 - x_2| + |y_1 - y_2|$.

Points   There are three groups of test sets, worth 100 points in total.

1. For the first group of test sets, worth 30 points, you may assume that $n \leq 10^2$.

2. For the second group of test sets, worth 70 points, there are no additional assumptions.

Sample Input

```
2
3
1 1
1 2
3 3
2
-1 3
1 0
```

Sample Output

```
8
5
```