Matching points in the plane

Time limit: 5 seconds

Problem Description

Consider $2n$ points on the XY-plane. Let S be the set of n points on the X-axis and T the set of n points on the Y-axis. For $s \in S$ and $t \in T$, we define their Euclidean distance $d(s,t)$ is the length of the line segment $\overline{st}$. Our goal is to find a 1-to-1 mapping between S and T such that the total Euclidean distance is maximum. That is, we want to find a 1-to-1 function $f : \{1..n\} \rightarrow \{1..n\}$ such that

$$\sum_{i=1}^{n} d(s_i, t_{f(i)})$$

is maximized, in which $S = \{s_i | 1 \leq i \leq n\}$ and $T = \{t_i | 1 \leq i \leq n\}$.

Technical Specifications

1. All coordinates are 16-bits integers.
2. n is a positive integer ≤ 1000.

Input Format

The first line of the input file contains an integer indicating the number of test cases to follow. Each test case has two lines: the first line for the X-coordinates of the points in S and the second line for the Y-coordinates of the points in T. There is a space between any two integers.

Output Format

For each test case, output the integer part of the maximum total distance in a line, i.e., round off the answers to integers.

Sample Input

```
2
1 2
3 4
141 200
200 141
```

Sample Output

```
7
489
```