

3457 Dimensionality Reduction

Dimensionality reduction is mapping a multidimensional space into a space of fewer dimensions. It is sometimes the case that analysis such as regression or classification can be carried out in the reduced space more accurately than in the original space.

The general principle of dimensionality reduction is finding the dimensions that capture the most variance.

In this problem, let's consider a simple scenario: mapping 3-dimensional to one dimension. Given N 3-dimensional points denoted as (a_i, b_i, c_i) , $1 \leq i \leq N$, you are to find a line in 3-dimensional space on which the projections (denoted as x_i , $1 \leq i \leq N$) of these points are mostly scattered. The scatter degree in one dimensional space is measured by:

$$\sum_{i=1}^N (x_i - m)^2, \text{ where } m = \frac{1}{N} \sum_{i=1}^N x_i.$$

Input

There are multiple test cases. For each test case, an integer N ($1 \leq N \leq 100$) will be given in the first line, and then points are given in the next N lines. Coordinates are integers in $[0, 10000]$.

Output

For each test case, print the maximum scatter degree of projections with precision of two decimal places in a single line.

Sample Input

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

Sample Output

```
4.00
```