

J. Minimum Sum

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: input.txt

output: output.txt

You are given a set of n vectors on a plane. For each vector you are allowed to multiply any of its coordinates by -1 . Thus, each vector $v_i = (x_i, y_i)$ can be transformed into one of the following four vectors:

- $v_i^1 = (x_i, y_i)$,
- $v_i^2 = (-x_i, y_i)$,
- $v_i^3 = (x_i, -y_i)$,
- $v_i^4 = (-x_i, -y_i)$.

You should find two vectors from the set and determine which of their coordinates should be multiplied by -1 so that the absolute value of the sum of the resulting vectors was minimally possible. More formally, you should choose two vectors v_i, v_j ($1 \leq i, j \leq n, i \neq j$) and two numbers k_1, k_2 ($1 \leq k_1, k_2 \leq 4$), so that the value of the expression $|v_i^{k_1} + v_j^{k_2}|$ were minimum.

Input

The first line contains a single integer n ($2 \leq n \leq 10^5$). Then n lines contain vectors as pairs of integers " $x_i y_i$ " ($-10000 \leq x_i, y_i \leq 10000$), one pair per line.

Output

Print on the first line four space-separated numbers " $i k_1 j k_2$ " — the answer to the problem. If there are several variants the absolute value of whose sums is minimum, you can print any of them.

Examples

input
5 -7 -3 9 0 -8 6 7 -8 4 -5
output
3 2 4 2

input
5 3 2 -4 7 -6 0 -8 4 5 1
output
3 4 5 4

Note

A sum of two vectors $v = (x_v, y_v)$ and $u = (x_u, y_u)$ is vector $s = v + u = (x_v + x_u, y_v + y_u)$.

An absolute value of vector $v = (x, y)$ is number .

In the second sample there are several valid answers, such as:

(3 1 4 2), (3 1 4 4), (3 4 4 1), (3 4 4 3), (4 1 3 2), (4 1 3 4), (4 2 3 1).