Triplet

Objective

To learn about the importance of complexity analysis in algorithm design.

Problem Description

Given a list of **N** integers, find the minimum and maximum value of the product of the triplets.

Input

The first line of the input is **N** (3 <= **N** <= 50,000). The next line contains **N** integers, whose values are between -1000 and 1000 inclusive.

Output

The output contains 2 integers, i.e. the minimum and maximum value of the triplets.

Sample Input

```
5
3 -2 -10 0 1
```

Sample Output

```
-30 60
```

Explanation

The possible triplets are:

1. (3, -2, -10) → value = 60
2. (3, -2, 0) →value = 0
3. (3, -2, 1) → value = -6
4. (3, -10, 0) → value = 0
5. (3, -10, 1) → value = -30
6. (3, 0, 1) → value = 0
7. (-2, -10, 0) → value = 0
8. (-2, -10, 1) → value = 20
9. (-2, 0, 1) → value = 0
10. (-10, 0, 1) → value = 0

Marking

- You will get 7 marks only if a $O(N^3)$ solution is implemented correctly.
- You will get 9 marks if a O(N logN) solution is implemented correctly.
- You will get 10 marks if a O(N) solution is implemented correctly.

Program Submission

Submit your solution as a file named Lab09g<LabGroupNo><MatricNo>.zip into the right folder.