Getting Started with Competitive Programming

Problem Solving session – Week 2

Problem Statement 1

You have a set of N slips of different colors. The i-th slip has the number Li written on it.

Suppose we have a set S of three slips with the numbers a, b, and c written on it. This collection of slips S is called a *nice triplet* if the numbers satisfy all the following conditions:

- $a<b+c$
- $b<c+a$
- $c<a+b$

How many different nice triplets can be formed? Two collections of slips are considered different when there is a color that occurs in only one of them.

Constraints

- All values in input are integers.
- $3 \leq N \leq 2 \times 10^3$
- $1 \leq Li \leq 10^3$

Input

Input is given from Standard Input in the following format:

```
N

L1, L2, ... LN
```

Constraints

Print the number of different triangles that can be formed.

Sample Input 1

```
4

3 4 2 1
```

Sample Output 1

```
1
```

Only one nice triplet can be formed using the first, second, and third slips.

Problem Statement 2

You have decided to join a local study group for this NPTEL course. You are going to be visiting $N-1$ fellow learners who happen to be there. These N learners, including you, are numbered 1 through N, and the **amicability** of learner i is A_i.

The N learners will arrive at the place one by one in some order. To make sure nobody gets lost, you have set the following rule: learners who have already arrived there should form a circle, and a learner who has just arrived there should cut into the circle somewhere.

When each learner, except the first one to arrive, arrives at the place, the learner gets **good vibes** equal to the smaller of the **amicability** of the clockwise adjacent learner and that of the counter-clockwise adjacent learner. The first learner to arrive gets 0 good vibes.

What is the maximum total good vibes that the N learners can get by optimally choosing the order of arrivals and the positions in the circle to cut into?

Constraints

- All values in input are integers.
- $2 \leq N \leq 2 \times 10^5$
- $1 \leq A_i \leq 10^9$

Input

Input is given from Standard Input in the following format:

```
N A1, A2,...AN
```

Output

Print the maximum total good vibes the N learners can get.

Sample Input 1

```
4

2 2 1 3
```

Sample Output 1

```
7
```

This is possible to achieve by arriving at the place in the order 4,2,1,3. It is left as an exercise to check how they can get total good vibes of 7.

Sample Input 2

```
7

1 1 1 1 1 1 1
```

Sample Output 2

```
6
```