New Year Present

HackerRank

Nina received an odd New Year's present from a student: a set of n unbreakable sticks. Each stick has a length, l, and the length of the i^{th} stick is l_{i-1}. Deciding to turn the gift into a lesson, Nina asks her students the following:

How many ways can you build a square using *exactly* 6 of these unbreakable sticks?

Note: Two ways are distinct if they use at least one different stick. As there are $\binom{n}{6}$ choices of sticks, we must determine which combinations of sticks can build a square.

Input Format

The first line contains an integer, n, denoting the number of sticks. The second line contains n space-separated integers $l_0, l_1, \ldots, l_{n-2}, l_{n-1}$ describing the length of each stick in the set.

Constraints

- $6 \leq n \leq 3000$
- $1 \leq l_i \leq 10^7$

Output Format

On a single line, print an integer representing the number of ways that 6 unbreakable sticks can be used to make a square.

Sample Input 0

```
8
4 5 1 5 1 9 4 5
```

Sample Output 0

```
3
```

Sample Input 1

```
6
1 2 3 4 5 6
```

Sample Output 1

```
0
```

Explanation

Sample 0
Given 8 sticks ($l = 4, 5, 1, 5, 1, 9, 4, 5$), the only possible side length for our square is 5. We can build square S in 3 different ways:

1. $S = \{l_0, l_1, l_2, l_3, l_4, l_6\} = \{4, 5, 1, 5, 1, 4\}$
2. $S = \{l_0, l_1, l_2, l_4, l_6, l_7\} = \{4, 5, 1, 1, 4, 5\}$
3. $S = \{l_0, l_2, l_3, l_4, l_6, l_7\} = \{4, 1, 5, 1, 4, 5\}$

In order to build a square with side length 5 using *exactly* 6 sticks, $l_0, l_2, l_4,$ and l_6 must always build two of the sides. For the remaining two sides, you must choose 2 of the remaining 3 sticks of length 5 ($l_1, l_3,$ and l_7).

Sample 1
We have to use all 6 sticks, making the largest stick length (6) the minimum side length for our square. No combination of the remaining sticks can build 3 more sides of length 6 (total length of all other sticks is $1 + 2 + 3 + 4 + 5 = 15$ and we need at least length $3 * 6 = 18$), so we print 0.