Educational DP Contest AtCoder J - Sushi

Time limit: 1.0s **Memory limit:** 1G

There are N dishes, numbered $1, 2, \ldots, N$. Initially, for each i $(1 \leq i \leq N)$, Dish i has a_i $(1 \leq a_i \leq 3)$ pieces of sushi on it.

Taro will perform the following operation repeatedly until all the pieces of sushi are eaten:

- Roll a die that shows the numbers $1, 2, \ldots, N$ with equal probabilities, and let i be the outcome. If there are some pieces of sushi on Dish i, eat one of them; if there is none, do nothing.

Find the expected number of times the operation is performed before all the pieces of sushi are eaten.

Constraints

- All values in input are integers.
- $1 \leq N \leq 300$
- $1 \leq a_i \leq 3$

Input Specification

The first line will contain the integer N.

The next line will contain N integers, $a_1, a_2, \ldots, a_N$.

Output Specification

Print the expected number of times the operation is performed before all the pieces of sushi are eaten. The output is considered correct when the relative difference is not greater than 10^{-9}.

Sample Input 1

```
3
1 1 1
```

Sample Output 1

```
5.5
```

Explanation For Sample 1

The expected number of operations before the first piece of sushi is eaten, is 1. After that, the expected number of operations before the second sushi is eaten, is 1.5. After that, the expected number of operations before the third sushi is eaten, is 3. Thus, the expected total number of operations is $1 + 1.5 + 3 = 5.5$.

Sample Input 2

```
1
3
```

Sample Output 2

```
3
```

Explanation For Sample 2

Outputs such as `3.00`, `3.000000003` and `2.999999997` will also be accepted.

Sample Input 3

```
2
1 2
```

Sample Output 3

```
4.5
```

Sample Input 4

```
10
1 3 2 3 3 2 3 2 1 3
```

Sample Output 4

```
54.48064457488221
```