SAC '22 Code Challenge 3 Junior P3 - Normal Probabilities

Time limit: 1.0s **Memory limit:** 256M

After discovering the 5 normalized probabilities, Kevin Yang was awarded the Nobel Prize for mathematics.

With this discovery, Kevin can solve even more combinatorics problems.

One of the combinatorics problems entails a list of N events that each have a normalized probability P_i of occurring.

Since these are normalized probabilities, there are 5 types of probability:

- `A` corresponds to a 100% probability of occurring.
- `B` corresponds to an 80% probability of occurring.
- `C` corresponds to a 60% probability of occurring.
- `D` corresponds to a 40% probability of occurring.
- `E` corresponds to a 20% probability of occurring.

Kevin wants to know how likely it is that all these N events occur (assuming each event is independent) up to an error of 10^{-6}.

Constraints

$1 \leq N \leq 100\,000$

$P_i \in \{$ `A`, `B`, `C`, `D`, `E` $\}$

Input Specification

The first line will contain N, the number of independent events.

The next N lines will contain P_i, one of the normalized probabilities (`A`, `B`, `C`, `D`, or `E`).

Output Specification

Output the probability of all N events occurring up to an error of 10^{-6}.

Sample Input 1

```
3
A
B
B
```

Sample Output 1

```
0.640000
```

Sample Input 2

```
4
B
C
D
E
```

Sample Output 2

```
0.038400
```