Problem HUFFMAN: Huffman

As more and more people get interested in huge sport events like the soccer world championship, the need for more and more bandwidth to transfer life streams, televison, ... arises. Your company, the Clever and Smart Geek Mobile Information Company Inc. has a fabulous new idea to bring information to the people. As more and more cell phones have access to the internet your company has decided to offer live ASCII art news streams to the masses. To minimize the needed bandwidth and therefore to maximize the profit your task as the lead software engineer is it to implement a data compression algorithm.

From your studies you remember a wide range of compression algorithms, but the only lossless algorithm you can remember is Huffman encoding (maybe you should have payed more attention to your teachers, but who cares, you are already lead software engineer).

Huffman encoding represents one of the most compact prefix-free representation of data. For a valid Huffman encoding the $\sum codelength(c) * probability(c)$ has to be minimal. Your task is to find a minimal Huffman enconding.

Input

The input contains several testcases. The first line of the input contains an integer *count* that gives the number of strings that follow. Each of the following *count* lines contains a single string. A string can contain blanks. It is at least one character and at most 10,000 characters long.

Output

For each line with a string in the input you have to output the sum $\sum codelength(c) * probability(c)$ with two digits precision.

Sample Input 1

```
2
I love ICPC.
I'm so happy, I could sing: lalala lelu ...
```

Sample Output 1

```
3.17
4.05
```