11: Snow Contours

Level: Medium
Time limit: 1 seconds

Due to the snowy weather, the board of **via** was busy creating snowballs, and they wanted them neatly arranged in a rectangular grid. The snowballs occupy consecutive cells in a single row with each cell containing exactly one snowball. Each snowball is either:

1. a square perfectly aligned with the grid square

2. a circle inscribed in the grid square

3. an equilateral triangle with a side corresponding to the bottom side of the grid square.
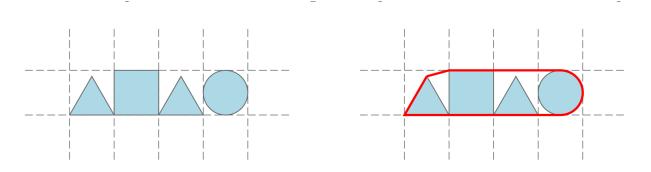

Figure 1: The snowballs from the first example input and their contour.

Informally, the convex contour of an arrangement is the shortest line that encloses all the snowballs. Formally, we can define it as the circumference of the convex hull of the union of all snowballs. Given an arrangement of snowballs, find the length of its contour.

Input

The first line contains an integer n (1 ≤ n ≤ 20) — the number of snowballs. The following line contains a string consisting of n characters that describe the snowballs in the arrangement left to right. Each character is an uppercase letter "S", "C" or "T" denoting a square, circle or a triangle respectively.

Output

Output a single floating point number — the length of the contour. The solution will be accepted if the absolute or the relative difference from the judges solution is less than 10^{-6}.

Sample input 1	Sample output 1
2 SS	6.000000

Sample input 2	Sample output 2
4 TSTC	9.088434417

Sample input 3	Sample output 3
3 SCT	7.50914177324