Novice Problem

Overhanging Cards

14 March 2009

Source File	`overhang.{java,c,cc}`
Input File	`overhang.in`
Output File	*standard output*

How far can you make a stack of cards overhang a table? If you have one card, you can create a maximum overhang of half a card length. (We're assuming that the cards must be perpendicular to the table.) With two cards you can make the top card overhang the bottom one by half a card length, and the bottom one overhang the table by a third of a card length, for a total maximum overhang of $1/2 + 1/3 = 5/6$ card lengths. In general you can make n cards overhang by

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + ... + \frac{1}{(n+1)}$$

card lengths, where the top card overhangs the second by $1/2$, the second overhangs the third by $1/3$, the third overhangs the fourth by $1/4$, etc., and the bottom card overhangs the table by $1/(n+1)$.

This is illustrated in the figure below.

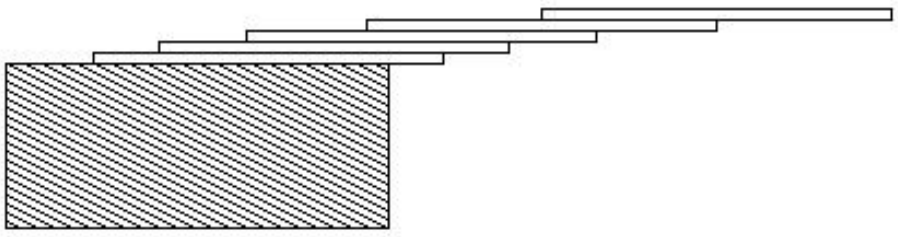

Figure 1: Overhanging with five cards.

Input

The input consists of one or more test cases, followed by a line containing the number 0.00 that signals the end of the input. Each test case is a single line containing a positive floating-point number c whose value is at least 0.01 and at most 5.20. For convenience, each c will contain exactly three digits and one decimal point.

Output

For each test case, output the minimum number of cards necessary to achieve an overhang of at least c card lengths, followed by a space, and the word `card`, inflected correctly for c.

Output is emitted to standard output, with no leading or trailing spaces.

C, C++	`stdout`
C++	`cout`
Java	`System.out`

Example

Sample input and output are given in figures 2 and 3, respectively.

```
1.00
3.71
0.04
5.19
0.00
```

Figure 2: Input

```
3␣cards
61␣cards
1␣card
273␣cards
```

Figure 3: Output