

Problem 5—The Knights of the Round Circle

A group of Jedi Knights is having a competition. One of the Knights at random stands within a circle. The other Knights, in a random order, challenge him. If a challenger defeats the Knight of the Round Circle, that Knight must leave the contest. The challenger then becomes the new Knight of the Round Circle and, as such, will face all subsequent challengers until he is defeated. If the current Knight of the Round Circle wins the challenge, he stays within the circle and the challenger must leave the competition. The Knight within the circle at the end of the competition is deemed the winner. You may assume that no two Knights have exactly the same skill and that a stronger Knight will always defeat a weaker Knight.

Suppose there are three Knights in the competition. If the strongest one happens to stand in the circle first, he will not be defeated, so no one will ever leave the circle. If the weakest one happens to be first in the circle, he will be kicked out after his first match. If the Knight that defeated him was the strongest, he will win the final challenge as well (so only one Knight will ever leave the circle), otherwise the strongest Knight will kick the middle Knight out of the circle during his challenge (so that two Knights leave the circle). If the middle Knight stands in the circle first, he will be the only one kicked out of the circle, no matter what order the other two come at him. All in all, an average of $5/6$ or 0.83 Knights will leave the circle during the competition.

You are to compute the average number of Knights to leave the circle during a competition given the number of Knights in the competition.

INPUT SPECIFICATION. The input file will consist of several lines. Each line (but the last) will contain one positive decimal integer no larger than 10000. This integer will be followed by exactly one `<EOLN>`. These integers represent the number of Knights in the competition. The last line will contain one zero, followed by `<EOLN>`. This line is not to be processed; it merely signifies the end of the input.

OUTPUT SPECIFICATION. The output cases are to appear in the same order in which they appear in the input file. For each case, you are to print “With c competitors, a Jedi Knight will be replaced approximately t times.” c is the number of competitors in this case and should be a decimal integer. t is the average number of times a Jedi Knight leaves the circle and should be a floating point decimal number with exactly two digits following the decimal point. There should always be at least one digit before the decimal point (use 0.50 rather $.50$, for example.) The statement should be followed by two `<EOLN>`'s, which is to say that a blank line should follow every output case.

SAMPLE INPUT.

```
3<EOLN>
1000<EOLN>
0<EOLN>
<EOF>
```

SAMPLE OUTPUT.

```
With 3 competitors, a Jedi Knight will be replaced approximately 0.83 times.<EOLN>
<EOLN>
With 1000 competitors, a Jedi Knight will be replaced approximately 6.49 times.<EOLN>
<EOLN>
<EOF>
```