D: Estimating PI

Professor Oak recently described how the positions of stars across the night sky may be used to deduce a surprisingly accurate value of π. This result followed from the application of certain theorems in number theory. Here, we don't have the night sky, but we can use the same theoretical basis to form an estimate for π: Given any pair of whole numbers chosen from a large, random collection of numbers, the probability that the two numbers have no common factor other than 1 is $(6 / \pi^2)$. For example, using the small collection of numbers: 2, 3, 4, 5, 6; there are 10 pairs that can be formed: (2,3), (2,4), etc. Six of the 10 pairs: (2,3), (2,5), (3,4), (3,5), (4,5) and (5,6) have no common factor other than 1. Using the ratio of the counts as the probability, we have: $(6 / \pi^2) \approx (6 / 10)$, therefore $\pi \approx 3.162$

Each input dataset will contain a set of pseudo-random positive integers. For each data set, find the portion of the pairs which may be formed that have no common factor other than 1, and use the method illustrated above to obtain an estimate for π . Report this estimate for each data set.

Input

The input consists of fewer than 100 data sets. The first line of each data set contains a positive integer *N* ($1 < N < 50$). There is one positive integer *K* per line for the next *N* lines that constitute the set for which the pairs are to be examined ($0 < K < 32{,}768$). Each integer of the input stream has its first digit as the first character on the input line. The set size designator, *N*, will be zero to indicate the end of the input data.

Output

A line with a single real value is to be printed for each input data set encountered. This value is the estimate of π for the current data set, rounded to six digits after the decimal point (use the standard rounding method supplied by your programming language). For some data sets, it may be impossible to estimate a value for π when there are no pairs that are relatively prime. In such cases, print the single-line message: `no estimate` .

Sample Input	Sample Output
5 2 3 4 5 6 2 13 39 0	3.162278 no estimate