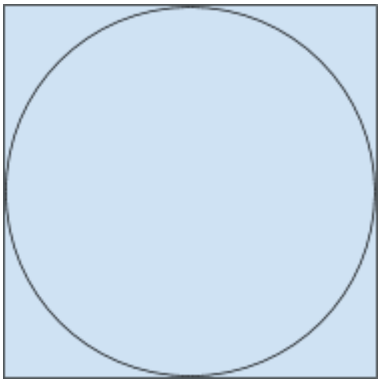
CS101: Computer Programming and Utilization, Autumn 2019
Lab Quiz 1 (20 Marks) (L2)

Q1 (5 marks)
Draw a circle inscribed in a square. (Note that we approximate a circle by a polygon of **n** sides with length '**L**'.) Hint: Use **n * L** as the circumference of the circle. Use $\pi = 3.1416$



Q2 (5 marks)
Given a sequence of numbers as input, print all the numbers (space separated) which appear after detecting the first two consecutive numbers to be equal. Stop when you get a negative number as input.
Assume that input will always consist of two such consecutive numbers and sequence will end with a negative number (i.e., the inputs will always be such that some sequence will be printed).

Sample Input 1
3 5 5 16 23 34 -1
Sample Output 1
16 23 34

Explanation
The first two consecutive same numbers are 5 5. So, print all numbers after it till a negative number appears (in this case, -1). The numbers in between are 16, 23, and 34, which are output separated by spaces.

Sample Input 2
12 12 10 10 1 -3
Sample Output 2
10 10 1

Q3 (5 marks)
Given n numbers in a sequence, output the *variance* of the **n** integers. The variance of '**n'** numbers is given by

$$\text{Variance}(a_1, a_2, \ldots, a_n) = (a_1^2 + a_2^2 + \ldots + a_n^2)/n - (a_1 + a_2 + \ldots + a_n)^2/n^2$$

As part of the input, the first number indicates the length of the input sequence, followed by the sequence of all 'n' numbers.

E.g., a sequence of 2 numbers is specified as the following input,
Sample Input
2 1 2
Sample Output
0.25

E.g., a sequence of 2 numbers is specified as the following input,
Sample Input
2 1 1
Sample Output
0

Q4 (5 marks)
Given an input number n, identify if it can be written as a sum of cubes of two natural numbers (natural numbers does not include zero). If it can be identified, output the sum of the two natural numbers, else output **-1**.
If a number can be expressed as sum of cubes, then the first solution is the ***only*** solution.

Hint: In a sequence of natural numbers, find every other combination and check whether such numbers exist.

Sample Input
126
Sample Output
6
Explanation: 126= 125+1= 1*1*1+5*5*5. Hence output 1+5 = 6

Sample input: 9
Sample output: 3

Sample Input
60
Sample Output
-1