Programming 1: Lab 3 : Operators, Expressions and Conditions

Write the python code for the following questions. Handle all the valid and invalid test cases. Write down relevant comments in your code:

1. Write a program that prompts the user to enter the three points (x1, y1) , (x2, y2) , and (x3 , y3) of a triangle and displays its area. The formula for computing the area of a triangle is

   s = (side1 + side2 + side3) / 2

   area = $\sqrt{}$[s(s - side1)(s - side2)(s – side3)]

2. Write a program that prompts the user to enter the side of a hexagon and displays its area. The formula for computing the area of a hexagon is Area = $(3\sqrt{}3 / 2) * s^2$, where s is the length of a side.

3. Take 3 numbers as input, and find whether they form the sides of a triangle or not. Consider invalid cases also.

4. Take a 3 digit number as input and find the sum of its digits. Also, check if the sum is divisible by 3 or not.

5. Take a 5 digit number as input and print the reverse of the number. Do not use any in-built functions for reversing. Check whether the input number and the reversed number are the same. If so, print “Number is Palindrome”, else print “Number is not Palindrome”.

6. Swap the values of two integer variables without using a third variable or multiple assignment operation.

7. Take a 3 digit number as input. Check if it is an Armstrong number or not. E.g. $1^3 + 5^3 + 3^3 = 153$

8. Suppose you save $100 each month into a savings account with an annual interest rate of 5%. Therefore, the monthly interest rate is 0.05/12 = 0.00417. After the first month, the value in the account becomes

   100 * (1 + 0.00417) = 100.417

   After the second month, the value in the account becomes

   (100 + 100.417) * (1 + 0.00417) = 201.252

   After the third month, the value in the account becomes

   (100 + 201.252) * (1 + 0.00417) = 302.507

   and so on.

   Write a program that prompts the user to enter a monthly saving amount, number of months (N) and displays the account value after the N^{th} month. Check for valid and invalid cases. Do not use loops.

9. Enter the coefficients of a quadratic equation and display its solutions. Handle all the cases for invalid input and display the solutions till exactly 2 decimal places. You need not calculate the complex solutions.