SFWR TECH 3PR3
Functions & Reference Variables

Assignment 2

1. Develop a C++ program that will compute the distance an object falls in a specific amount of time. The user must input the amount of time the object falls (t, measured in sec.) and the gravity (g, measured in m/sec^2). The program will print the input values (t and g) and the calculated distance parsed (D, measured in meters). The relationship is $D = 1/2gt^2$. Note: on Earth, the gravitational acceleration is g=9.81m/s. Your program should allow the user to enter any value he/she prefers. Create and call the following functions. The functions must be named as indicated below and return a value as indicated. Use input validation in the function as needed.

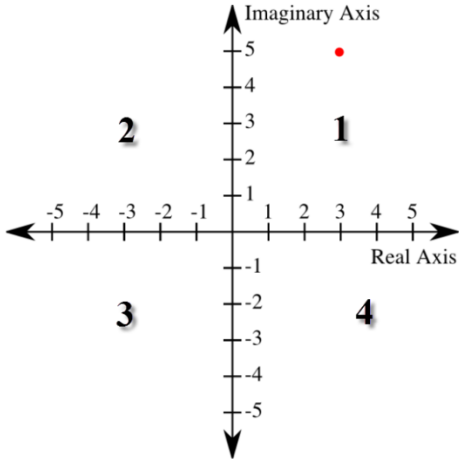
    a. inputTime( )
    The inputTime function will prompt the user to enter a value that represents the number of seconds and will return that value. Indicate the units (seconds) to the user. The inputTime function will not have any parameters.

    b. inputGravity( )
    The inputGravity function will prompt the user to enter a value that represents gravity and will return that value. Indicate the units (m/sec^2) to the user. The inputGravity function will not have any parameters.

    c. fallingDistance(n1, n2)
    where n1 represents the time in seconds and n2 represents the gravity. The calcFallingDistance function will calcuate the distance an object falls using the formula $D = 1/2gt^2$. Return the result.

    d. printResults(n1, n2, n3)
    where n1 represents the time in seconds, n2 represents the gravity, n3 represents the falling distance. The printResults function will print suitable output indicating the time, gravity and falling distance calculation.

2. Prompt the user to enter both the real (*real*) and imaginary (*imag*) parts of a complex number. Write **one** function that will calculate the *magnitude* & *angle* (in degrees) of this complex number (see formulae below). The function should also determine which quadrant this number belongs to (refer to figure for clarification). The function must supply the values of the magnitude, angle and the quadrant number to be printed in main().



$$magnitude = \sqrt{real^2 + imag^2}$$

$$\theta = \tan^{-1}\left|\frac{imag}{real}\right|$$

Note: Don't accept real or imaginary parts that are equal to 0.

Note: - Indicate the units for all I/O values required from- or provided to- the user.

Create a Word .doc file that contains the source code and a screen captures of the console window as the program is running, for all C++ programs. Save this file as *YourName_Assignment_2.doc* and upload and submit to the appropriate AVENUE lab assignment drop-box.