

COSC 1336 – Programming Fundamentals I

Program 8 – Simple Functions

The quadratic formula is used to solve a very specific type of equation, called a *quadratic equation*. These equations are usually written in the following form:

$$ax^2 + bx + c = 0$$

The Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Where **a**, **b**, and **c** are constants with **a** ≠ 0. (If **a** = 0, the equation is a linear equation.)

The **discriminant** is the part of the formula in the square root. If the value of the discriminant is zero then the equation has a single real root. If the value of the discriminant is positive then the equation has two real roots. If the value of the discriminant is negative, then the equation has two complex roots.

Write a program that finds the roots of the quadratic equation using the Quadratic Formula. Write a function named **discriminant** in the file, **Disc.py**, to calculate and return the discriminant of the formula. Let the main function call the discriminant function and then calculate the solution(s) of the equation. **Do not calculate the solutions in the discriminant function. You will not get credit for the program if you do.** Allow the user to run the program as many times as possible until a sentinel value of zero (0), has been entered for the coefficient A. Include the recommended minimum documentation for each function. See the program one template for more details.

Do not use any global variables. You will not get credit for the program if you do.

Run the program at least four times with the data below and save the output as **Program8-output.py** (Do a "Save As" in the Python Shell Window and it will save as a ".py" file. See Appendix B of your Textbook for more details). Create a folder named, **Fullname_Program8**. Copy your source codes (Program8.py and Disc.py) and the output file to the folder. Zip the folder, as a ".zip" file, and upload it to Blackboard.

Run 1

a = 1
b = 2
c = -8

Run 2

a = 1
b = -12
c = 36

Run 3

a = 2
b = 9
c = -5

Run 4

a = 4
b = 6
c = 20