assgn2_D1228817

Preventing the user from inputting invalid coefficients:

To check if the inputs are valid, conditional statements are used. If the inputs are invalid, the program will be ended with the code “exit(0)”. Besides that, a message telling the user why the program has ended will be printed out. Below are the 2 types of invalid inputs that will cause the program to end.

1. “a” equals to 0
2. The inputs are not integers (checked by first letting “A”, “B” and “C” to be integers of “a”, “b” and “c” respectively without the numbers after their decimal points, then see if they are the same value)

Checking if the equation has real roots or complex roots:

In this program, “j” is used to identify which kind of roots the equation has. By default , “j” is 0. With the use of conditional statements, if b^2-4*a*c is less than 0, the value of j will increase by 1, otherwise, it remains the same.

Printing the coefficient for the first term:

A series of conditional statements are used for this section. If “a” equals to 1 / -1, X**2 / -X**2 will be printed out to satisfy the pretty printing format. Otherwise, the coefficient of the first term will be whatever the user inputted as “a”.

Printing the coefficient for the second term:

A series of conditional statements are used for this section. If “b” equals 1 / -1, +X / -X will be printed out to satisfy the pretty printing format. Also, if “b” is 0, then X will not be printed out. Otherwise, the second term will be printed out as +bX (if “b” is greater than 0) or -bX (if “b” is less than 0).

Printing the constant:

If “c” equals 0, the constant will not be printed out. Otherwise, the constant will be printed out as +c (if “c” is greater than 0) or -c (if “c” is less than 0).

Printing out the roots:

There are four types of output:

1. Multiple real root (“j” equals to 0, and root_one and root_two are the same)

2. 2 real roots (“j” equals to 0, and root_one and root_two are not the same)
3. 2 complex roots, “b”!=0 (“b”!=0, and “j” equals 1. The letter “i” is added at the end of both roots to show that they are complex roots.)
4. 2 complex roots, “b”=0 (“b”=0, and “j” equals 1. The letter “i” is added at the end of both roots to show that they are complex roots.)

Problems encountered:

For me, the most difficult part of the assignment was to figure out how to print out complex roots. In the end, I used the value of “j” to determine if the equation has complex roots or not. Also, to make sure the complex roots can be printed out correctly, the negative value inside the square root will be converted into absolute value first. Then when printing out the roots, “i” will be printed after the values of the square roots.