Lab # 2

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CPSC 1150 - W01

Instructor: H. Darbandi

Lab Title: Quadratic Formula Lab

Date submitted:

Department: CPSC

Program Quadratic Formula

File Name: Lab2.java

Purpose: Calculate roots, x1 and x2, of a quadratic equation:

where a, b, and c are parameters or the equation.

Input: a, b and c

Output: x1 and x2

Technical Information:

(You should fill the following information based on compiler and computer you are using).

Compiler: IntelliJ IDEA Community Edition 2023.1.1

Computer: (R) Core(TM) i7-10870H CPU @ 2.20GHz 2.21 GHz, 16 GB of RAM

Operating System: Windows 10 Home Single Language

Language: Java

Program Logic (Pseudocode)

Algorithm: find the roots of a quadratic equation in the form of: ax2 + bx + c =0

START

1. a, b, c ← input

2. if a = 0 then

solve the linear equation bx + c =0

x ← -c/b

END

3. delta ← b2 - 4ac

4. if delta < 0 then

equation has no real roots

END

5. if delta = 0 then

two equal roots

END

7. otherwise

equation has two roots

END

Generate your test cases based on the specifications in your lab assignment. Follow following format for each test case: (Refer to external document of your previous lab)

*purpose*

*input*

*output*

*expected value*

*passed or failed*

Test Cases:

Test case 1: a and b both are 0

a = 0

b = 0

c = 1

Output: Not a valid input. Try again.

Expected Value: Not a valid input. Try again.

Passed

Test case 2: only a is 0

a = 0

b = 1

c = 1

Output: Linear Equation

x = -1.0

Expected Value: Linear equation. x = -1

Passed

Test case 3: discriminant is 0

a = 1

b = 2

c = 1

Output: Double roots.

x1 = x2 = -1.0

Expected Value: Double roots. x1 = x2 = -1

Passed

Test case 4: discriminant is positive

a = 1

b = -7

c = 12

Output: Two real roots

x1 = 4.0

x2 = 3.0

Expected Value: Two real roots. x1 = 4, x2 = 3

Passed

Test case 5: discriminant is negative

a = 3

b = 1

c = 1

Output: No real roots.

Expected Value: No real roots.

Passed