**Testing software – SGU – 2025**

**Exercise 1**

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**Class:** DCT122C2 – Friday morning

I. VERIFICATION AND VALIDATION

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The problems of System 1:

• Do not have DELTA variable (verification)

• x2 variable got wrong formula (validation)

The problems of System 2:

• There is no handling for the case Input DELTA is negative (verification)

II. TEST-CASES

**a) There are 4 test-cases for this function**

A close-up of a computer code

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• Test-case 1: Input x < = 10

• Test-case 2: Input 10 < x <= 1,073,741,824

• Test-case 3: Input x > 1,073,741,823

• Test-case 4: Input x <= −2,147,483,647

**b) There are 5 test-cases for this function**

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AI-generated content may be incorrect.

• Test-case 1: Input 10 < x < 1,073,741,824

• Test-case 2: Input 0 < x <= 10

• Test-case 3: Input -1,073,741,824 <= x < 0

• Test-case 4: Input x < -1,073,741,824

• Test-case 5: Input x > 1,073,741,823

**c) There are 4 test-cases for this function**

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• Test-case 1: Input 10 <= x < 1,073,741,824

• Test-case 2: Input x > 1,073,741,823

• Test-case 3: Input -1,073,741,824 <= x < 10

• Test-case 4: Input x < -1,073,741,824

**d) There are 3 test-cases for this function**

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• Test-case 1: Input x > -PI/2 and x <PI/2

• Test-case 2: Input x >= PI/2

• Test-case 3: Input x <= -PI/2

**e) There are 7 test-cases for this function**

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• Test-case 1: if num1==num2 OR num1==num3 OR num2==num3

• Test-case 2: if num1==num2 AND num1==num3

• Test-case 3: if num1>num2 AND num1>num3

• Test-case 4: if num2>num1 AND num2>num3

• Test-case 5: if num3>num1 AND num3>num2

• Test-case 6: if num1> int.MAX OR num2>int.MAX OR num3>int.MAX

• Test-case 7: if num1< int.MIN OR num2<int. MIN OR num3<int. MIN

III. PRACTICE 1 – solveQuartic

This mathematic problem solves the Quartic formula.

The ideal input is three double values within the valid range of double type.

Test-cases:

• Test-case 1: Input a = a, b = b, c = c Expected: "Syntax error."

• Test-case 2: Input a = 0, b = 0, c = 0 Expected: "Infinite solutions."

• Test-case 3: Input a = 0, b = 0, c = 2.2 Expected: "No solutions."

• Test-case 4: Input a = 0, b = -4.1, c = 3.2 Expected: 0.7805

• Test-case 5: Input a = 1.0, b =2.0, c=1.0 Expected: -1.0

• Test-case 6: Input a = 1.5, b = 4.2, c =1.1 Expected: −2.507 −0.293

• Test-case 7: Input a = 1.0, b = 1.0, c = 1.0 Expected: "No solutions."