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| NAME: | Sarcol, Joshua S | DATE: | 09/18/2023 |

PRACTICE EXERCISE # 4.1

# LE4\_11 Vowel and Consonant.

Determine whether the letter entered by the user is vowel or consonant. Do not use predefine functions (isAlpha, tolower, toupper, etc.).

Sample/Test Output

Enter a letter: A       VOWEL!

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Enter a letter: a       VOWEL!

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Enter a letter: G       CONSONANT!

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Enter a letter: $       INVALID INPUT!

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Enter a letter: 5       INVALID INPUT!

## Pseudocode: Vowel and Consonant

START

* 1. INITIALIZE letter as character
  2. PRINT “Enter a letter: “
  3. READ letter
  4. CHECK value of letter
     1. IF letter is a vowel
        1. PRINT “VOWEL!”
     2. ELSE IF letter is consonant
        1. PRINT “CONSONANT!”
     3. ELSE
        1. PRINT “INVALID INPUT!”
     4. ENDIF

STOP

## Flowchart: Vowel and Consonant

A group of white squares with black text

Description automatically generated

# LE4\_12 Quadratic Equation.

Compute the real roots of a quadratic equation. The roots can be calculated using the following formulas:

It will prompt the user to enter the constants (a, b, c) and display the roots based on the following rules:

If both a and b are zero, there is no solution

If a is zero, there is only one root (-c/b).

If the discriminate (b2-4ac) is negative, there are no real roots

For all other combinations, there are two roots.

## Pseudocode: Quadratic Equation

START

* 1. INITIALIZE a, b, c, discriminant, x1, x2 as float
  2. PRINT “Enter coefficient of x^2 term: ”
  3. READ a
  4. PRINT “Enter coefficient of x term: ”
  5. READ b
  6. PRINT “Enter constant term: ”
  7. READ c
  8. CALCULATE discriminant, discriminant = b\*b - 4\*a\*c
  9. SOLVE for the quadratic equation
     1. IF a == b and b == 0
        1. PRINT “No solutions found.”
     2. ELSE IF a == 0
        1. CALCULATE x1, x1 = -c / b
        2. PRINT “One solution found: x1”
     3. ELSE IF discriminant < 0
        1. PRINT “No real-numbered solutions found.”
     4. ELSE
        1. CALCULATE x1, x1 = (-1 \* b + sqrt(discriminant)) / 2\*a
        2. CALCULATE x2, x2 = (-1 \* b - sqrt(discriminant)) / 2\*a
        3. PRINT “Two solutions found: x1, x2”
     5. ENDIF

STOP

## Flowchart: Quadratic Equation

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Description automatically generated**

# LE4\_13 Student’s Final Grade.

Determine a student’s final grade and indicate whether it is passing or failing. The final grade is calculated as the average of four marks (between 0 and 100). Passing grade of 50.

Sample/Test Output

1st Mark : 100        2nd Mark : 85       3rd Mark : 96       4th Mark : 88

FINAL GRADE: 92.25    REMARKS  : PASSED

================================================================================

1st Mark : 55         2nd Mark : 70       3rd Mark : 10       4th Mark : 50

FINAL GRADE: 46.25    REMARKS : FAILED

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1st Mark : 100        2nd Mark : 120      3rd Mark : 96       4th Mark : 88

INVALID INPUT!

## Pseudocode: Student’s Final Grade

START

1. INITIALIZE first, second, third, fourth, average as float
2. INITIALIZE bound1st, bound2nd, bound3rd, bound4th as integer
3. PRINT “1st Mark : ”
4. READ first
5. CHECK value of first
6. IF first <= 0 and first >= 100
   * + 1. SET bound1st = 1
7. ENDIF
8. PRINT “2nd Mark : ”
9. READ second
10. CHECK value of second
11. IF second <= 0 and second >= 100
    * + 1. SET bound2nd = 1
12. ENDIF
13. PRINT “3rd Mark : ”
14. READ third
15. CHECK value of third
16. IF third <= 0 and third >= 100
17. SET bound3rd = 1
18. ENDIF
19. PRINT “4th Mark : ”
20. READ fourth
21. CHECK value of fourth
22. IF fourth <= 0 and fourth >= 100
23. SET bound4th = 1
24. ENDIF
25. CHECK if input values are in range
26. IF bound1st + bound2nd + bound3rd + bound4th == 4
27. CALCULATE average, average = (first + second + third + fourth) / 4
28. PRINT “FINAL GRADE: average”
29. CHECK value of average
    * + - 1. IF average >= 50

PRINT “REMARKS : PASSED”

* + - * 1. ELSE

PRINT “REMARKS : FAILED”

* + - * 1. ENDIF

1. ELSE
2. PRINT “INVALID INPUT!”
3. ENDIF

STOP

## Flowchart: Student’s Final Grade

