MODULE 2
Constructs of a pseudocode - Decision or Selection

Class Room Exercises

1. **Problem Statement:** Write a pseudocode that checks if a number is greater than 100. If it is, print "Number is greater than 100."

```
BEGIN
    PRINT "Enter a number:"
    INPUT number
    IF number > 100 THEN
        PRINT "Number is greater than 100."
    END IF
END
```

2. **Problem Statement:** Write a pseudocode to check if a person is eligible for a driving license. The minimum age requirement is 16 years. If the person is 16 or older, print "Eligible for a driving license." Otherwise, print "Not eligible for a driving license."

```
BEGIN
    PRINT "Enter your age:"
    INPUT age
    IF age >= 16 THEN
        PRINT "Eligible for a driving license."
    ELSE
        PRINT "Not eligible for a driving license."
    END IF
END
```

3. **Problem Statement:** Write a pseudocode that assigns a grade based on the marks obtained by a student:
   - If the marks are 90 or above, the grade is "A."
   - Otherwise, print "Below A grade."

```
BEGIN
    PRINT "Enter your marks:"
    INPUT marks
    IF marks >= 90 THEN
        PRINT "Grade: A"
    ELSE
        PRINT "Below A grade."
    END IF
END
```

4. **Problem Statement:** Write a pseudocode to check whether a number is divisible by 5. If it is, print "Divisible by 5." Otherwise, print "Not divisible by 5."

```
BEGIN
    PRINT "Enter a number:"
    INPUT number
    IF number MOD 5 = 0 THEN
        PRINT "Divisible by 5."
    ELSE
        PRINT "Not divisible by 5."
    END IF
END
```

5. **Problem Statement:** Write a pseudocode that checks if a student has passed or failed an exam. The passing mark is 40 or above. If the student scores 40 or more, print "Pass." Otherwise, print "Fail."

```
BEGIN
    PRINT "Enter your exam score:"
    INPUT score
    IF score >= 40 THEN
        PRINT "Pass"
    ELSE
        PRINT "Fail"
    END IF
END
```

6. **Problem Statement:** Write a pseudocode that checks whether a number is even or odd using a simple if construct.

```
BEGIN
    PRINT "Enter a number:"
    INPUT number

    IF number MOD 2 = 0 THEN
        PRINT "The number is even."
    END IF
END
```

7. **Problem Statement:** Write a pseudocode to check if a person is eligible to vote. To be eligible, the person must be 18 years or older.

```
BEGIN
    PRINT "Enter your age:"
    INPUT age

    IF age >= 18 THEN
        PRINT "You are eligible to vote."
    ELSE
        PRINT "You are not eligible to vote."
    END IF
END
```

8. **Problem Statement:** A customer visits an online store that offers a discount based on the total purchase amount:
   - If the total is greater than $500, apply a 20% discount.
   - If the total is between $200 and $500 (inclusive), apply a 10% discount.
   - If the total is less than $200, no discount is applied.

   Write a pseudocode that calculates the final amount after applying the discount.

```
BEGIN
    PRINT "Enter the total purchase amount:"
    INPUT total_amount

    IF total_amount > 500 THEN
        discount = total_amount * 0.20
        final_amount = total_amount - discount
        PRINT "20% discount applied. Final amount is:",
final_amount
    ELSE IF total_amount >= 200 AND total_amount <= 500 THEN
        discount = total_amount * 0.10
        final_amount = total_amount - discount
        PRINT "10% discount applied. Final amount is:",
final_amount
    ELSE
        PRINT "No discount applied. Final amount is:",
total_amount
    END IF
END
```

9. **Problem Statement:** Create a pseudocode for a simple traffic light system. The system operates in the following way:
   - If the light is green, cars can go.
   - If the light is yellow, cars should slow down.
   - If the light is red, cars must stop.

   Write the pseudocode that determines what message to display based on the light color input.

```
BEGIN
    PRINT "Enter the traffic light color (green, yellow, red):"
    INPUT light_color

    IF light_color = "green" THEN
        PRINT "Go!"
    ELSE IF light_color = "yellow" THEN
        PRINT "Slow down!"
    ELSE IF light_color = "red" THEN
        PRINT "Stop!"
    ELSE
        PRINT "Invalid color!"
    END IF
END
```

10. **Problem Statement:** Write a pseudocode that checks the strength of a user's password. The rules for checking the strength are:
    - If the password length is less than 6 characters, it is considered "Weak."
    - If the password contains at least 6 characters but less than 10 characters, it is "Moderate."
    - If the password contains 10 or more characters, it is "Strong."

```
BEGIN
    PRINT "Enter your password:"
    INPUT password

    password_length = LENGTH(password)

    IF password_length < 6 THEN
        PRINT "Password strength: Weak"
    ELSE IF password_length >= 6 AND password_length < 10 THEN
        PRINT "Password strength: Moderate"
    ELSE IF password_length >= 10 THEN
        PRINT "Password strength: Strong"
    END IF
END
```

11. Write a pseudocode program that takes a day of the week as input (e.g., "Monday", "Tuesday") and prints a specific message for that day using a case structure. For example, if the input is "Monday", the output could be "It's the start of the week." If the input is invalid (not a day of the week), display an appropriate error message.

```
START
  Declare dayOfWeek as String
  Input dayOfWeek

  CASEOF (dayOfWeek)
    CASE "Monday":
      PRINT "It's the start of the week."
      BREAK
    CASE "Tuesday":
      PRINT "It's the second day of the week."
      BREAK
    CASE "Wednesday":
      PRINT "Mid-week!"
      BREAK
    CASE "Thursday":
      PRINT "Almost the weekend."
      BREAK
    CASE "Friday":
      PRINT "Weekend is near!"
      BREAK
    CASE "Saturday", "Sunday":
      PRINT "It's the weekend!"
      BREAK
    DEFAULT:
      PRINT "Invalid day entered."
  END CASE
```

```
END
```

12. Create a pseudocode program that accepts a numerical score (0-100) as input and assigns a letter grade (A, B, C, D, F) based on that score using a case structure. For example, if the score is between 90 and 100, the grade should be "A". Ensure the program handles scores outside the 0-100 range by displaying an error message.

```
START
  Declare score as Integer
  Input score

  CASEOF (score)
    CASE score >= 90 AND score <= 100:
      PRINT "Grade A"
      BREAK
    CASE score >= 80 AND score < 90:
      PRINT "Grade B"
      BREAK
    CASE score >= 70 AND score < 80:
      PRINT "Grade C"
      BREAK
    CASE score >= 60 AND score < 70:
      PRINT "Grade D"
      BREAK
    CASE score < 60:
      PRINT "Grade F"
      BREAK
    DEFAULT:
      PRINT "Invalid score entered."
  END CASE
END
```

13. Write a pseudocode program that functions as a simple calculator. The program should take two numbers and an operator (+, -, *, /) as input and use a case structure to perform the corresponding mathematical operation. If the user inputs a division by zero, the program should display an error message instead of attempting the calculation. After the operation, the program should print the result.

```
START
Declare number1, number2 as Float
Declare operator as Character
Input number1
Input number2
Input operator

CASEOF (operator)
  CASE '+':
    result = number1 + number2
    PRINT "Result: " + result
    BREAK
  CASE '-':
    result = number1 - number2
    PRINT "Result: " + result
```

```
      BREAK
    CASE '*':
      result = number1 * number2
      PRINT "Result: " + result
      BREAK
    CASE '/':
      IF number2 != 0:
        result = number1 / number2
        PRINT "Result: " + result
      ELSE:
        PRINT "Cannot divide by zero"
      BREAK
    DEFAULT:
      PRINT "Invalid operator"
  END CASE
END
```

14. Develop a pseudocode program that simulates a traffic light control system using a case structure. The program should take a color input (Red, Yellow, or Green) and print the corresponding action ("Stop", "Prepare to stop", or "Go"). If the input color is not valid, display an error message.

```
START
  Declare lightColor as String
  Input lightColor

  CASEOF (lightColor)
    CASE "Red":
      PRINT "Stop"
      BREAK
    CASE "Yellow":
      PRINT "Prepare to stop"
      BREAK
    CASE "Green":
      PRINT "Go"
      BREAK
    DEFAULT:
      PRINT "Invalid light color"
  END CASE
END
```

15. Create a pseudocode program that takes the number of a month (1 for January, 2 for February, etc.) as input and uses a case structure to print how many days are in that month. For simplicity, assume February always has 28 days. Group the months with the same number of days into one case in the case structure where possible. If an invalid month number is input (e.g., 13), display an error message

```
START
  Declare month as Integer
  Input month

  CASEOF (month)
    CASE 1, 3, 5, 7, 8, 10, 12:
      PRINT "31 days"
```

```
      BREAK
    CASE 4, 6, 9, 11:
      PRINT "30 days"
      BREAK
    CASE 2:
      PRINT "28 days"
      BREAK
    DEFAULT:
      PRINT "Invalid month entered."
  END CASE
END
```

16. Write a pseudocode program that evaluates a student's performance based on their letter grade (A, B, C, D, F) using a case structure. The program should take the grade as input and print a corresponding performance message, such as "Excellent" for an "A" or "Fail" for an "F". Ensure the program can handle invalid grades by displaying an error message.

```
START
  Declare grade as Character
  Input grade

  CASEOF (grade)
    CASE 'A':
      PRINT "Excellent"
      BREAK
    CASE 'B':
      PRINT "Good"
      BREAK
    CASE 'C':
      PRINT "Average"
      BREAK
    CASE 'D':
      PRINT "Poor"
      BREAK
    CASE 'F':
      PRINT "Fail"
      BREAK
    DEFAULT:
      PRINT "Invalid grade"
  END CASE
END
```