**ABAARSO TECH UNIVERSITY**

**DEGREE IN SOFTWARE ENGINEERING**

**Assignment: Mastering Dart Fundamentals**

Instructions:

Implement solutions for the following 10 logic-based programming questions. Your solutions should demonstrate your understanding of the key programming concepts listed (boolean, conditionals, double, integer, loops, math, strings, variables, functions, lists, classes, constructors, and inheritance).

1. Boolean and Conditional Statements:

Write a program that determines if a given year is a leap year. A year is a leap year if it is divisible by 4, except for years that are divisible by 100, unless they are also divisible by 400.

2. Integers and Math Operations:

Write a function that takes two integers as input and returns their greatest common divisor (GCD) using the Euclidean algorithm.

3. Loops and Strings:

Write a program that takes a string as input and reverses the order of the characters in the string using a `for` loop.

4. Variables and Functions:

Write a function that takes a list of integers as input and returns the average of the numbers in the list.

5. Conditional Statements and Loops:

Write a program that uses a `while` loop to generate the first 20 Fibonacci numbers and stores them in a list. Then, print only the even-numbered Fibonacci numbers from the list.

6. Double and Math Operations:

Write a function that takes the radius of a circle as a `double` input and returns the area and circumference of the circle.

7. Functions and Lists:

Write a function that takes a list of integers as input and returns a new list that contains only the unique elements from the original list.

8. Classes and Constructors:

Define a `BankAccount` class with properties for the account number, balance, and owner name. Include a constructor that initializes these properties and methods to deposit, withdraw, and check the account balance.

9. Inheritance:

Create a `SavingsAccount` class that inherits from the `BankAccount` class and adds a property for the interest rate. Include a method to calculate the monthly interest earned.

10. Variables and Conditionals:

Write a program that takes two string inputs, representing two words, and determines if the second word is an anagram of the first word using only variable assignments and conditional statements.

**Grading criteria:**

1. Correctness (60%)

2. Efficiency and Readability (20%)

3. Application of Programming Concepts (20%)

4. Originality (pass/fail)