Session 5 Exercises

Exercise 1: Dart Basics

Write a Dart program to print "Hello, Dart!" to the console.

Goal: Learn how to use the main() function and print statements.

Exercise 2: Variables and Data Types

Declare three variables:

- An integer named age with a value of 25.
- A double named height with a value of 5.9.
- A string named name with a value of "Dart Programmer".

Print each variable's value.

Goal: Understand variable declaration and Dart's type system.

Exercise 3: Conditional Statements

Write a program that takes an integer input and checks if it's even or odd. Print "Even" if the number is even and "Odd" otherwise.

Goal: Learn how to use if-else and modulo operator.

Exercise 4: Loops

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Write a Dart program to print the first 10 numbers in the Fibonacci sequence.

Goal: Practice loops and basic algorithmic thinking.

Exercise 5: Functions

Create a function called calculateArea that takes two parameters: length and width. The function should return the area of a rectangle. Call the function and print the result.

Goal: Understand function creation, parameters, and return values.

Exercise 6: OOP - Classes and Objects

Create a class Car with the following properties:

- make (String)
- model (String)
- year (int)

Add a method displayInfo() that prints all the car's details. Instantiate a Car object and call its displayInfo() method.

Goal: Introduce classes, objects, and methods.

Exercise 7: Encapsulation

Add private properties _make and _model to the Car class created in Exercise 6. Add getters and

setters for these properties. Modify the class to demonstrate encapsulation.

Goal: Understand access control and encapsulation principles.

Exercise 8: Inheritance

Create a class ElectricCar that inherits from the Car class. Add a new property batteryCapacity (int) and a method displayBatteryStatus() that prints the battery capacity. Override the displayInfo() method to include battery details.

Goal: Practice inheritance and method overriding.

Exercise 9: Polymorphism

Create a base class Shape with a method calculateArea(). Create two derived classes:

- Circle with a property radius.
- Rectangle with properties length and width.

Override the calculateArea() method in both classes. Write a program to calculate and print the area of a circle and a rectangle.

Goal: Understand polymorphism and method overriding.

Exercise 10: OOP - Mixins

Create a mixin Logger with a method log(String message) that prints a log message. Apply the mixin

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to a User class that contains name and email properties. Use the log method in the User class to log messages like "User created" and "User deleted."

Goal: Learn about mixins and their application in Dart.