

## **OOPs Concepts Assignment**

### **### Problem 1: Class and Object**

#### **Problem Statement:**

**Create a class Car with attributes brand, model, and year. Create an object of this class and print its attributes.**

#### **Input Format:**

**The input consists of three values: brand, model, and year of the car.**

#### **Constraints:**

**Brand and model are strings, and the year is an integer.**

#### **Output Format:**

**Print the details of the car object.**

#### **Example:**

##### **Input:**

**Toyota Corolla 2022**

##### **Output:**

**Brand: Toyota**

**Model: Corolla**

**Year: 2022**

**---**

### **### Problem 2: Encapsulation**

#### **Problem Statement:**

**Create a class BankAccount with private attributes account\_number and balance. Implement methods to set and get the balance while ensuring data security.**

#### **Input Format:**

**The input consists of an account number and initial balance.**

#### **Constraints:**

**Balance should be a non-negative integer.**

**Output Format:**

**Print the account details ensuring encapsulation principles.**

**Example:**

**Input:**

**123456789 5000**

**Output:**

**Account Number: 123456789**

**Balance: 5000**

**---**

### **### Problem 3: Inheritance**

**Problem Statement:**

**Create a base class Animal with a method make\_sound(). Derive a class Dog from Animal and override the method to print "Bark".**

**Input Format:**

**No input required.**

**Constraints:**

**The derived class should inherit the base class properties.**

**Output Format:**

**Invoke make\_sound() method from Dog class and print the sound.**

**Example:**

**Output:**

**Bark**

**---**

### **### Problem 4: Polymorphism**

**Problem Statement:**

**Create a class Shape with a method area(). Derive two classes Circle**

and Rectangle, overriding area() to calculate respective areas.

**Input Format:**

The input consists of radius for Circle and length, width for Rectangle.

**Constraints:**

Radius, length, and width should be positive integers.

**Output Format:**

Print the area of the shapes.

**Example:**

**Input:**

Circle 5

Rectangle 4 6

**Output:**

Area of Circle: 78.5

Area of Rectangle: 24

---

**### Problem 5: Abstraction**

**Problem Statement:**

Create an abstract class Vehicle with an abstract method start(). Implement this method in derived classes Car and Bike.

**Input Format:**

No input required.

**Constraints:**

Derived classes should implement the abstract method.

**Output Format:**

Invoke start() method for both classes and print respective messages.

**Example:**

**Output:**

**Car is starting...**

**Bike is starting...**