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CSE110 Section 3 Lab Questions Fall 2023

East West University

**Use a Test class to test all functionalities of your written Java classes. Introduce class attributes as per your best judgments, however maintain proper practice of private/public access modifiers for all attributes, and methods.

Overriding

1. Create a Java class `Shape` with a method `calculateArea()`. Derive classes `Circle` and `Rectangle` from `Shape` and override the `calculateArea()` method for each shape.

2. Implement a Java class `Animal` with a method `makeSound()`. Create subclasses `Dog`, `Cat`, and `Cow` that override the `makeSound()` method with appropriate animal sounds.

3. Write a Java program that demonstrates method overriding for a `Vehicle` class with subclasses `Car` and `Motorcycle`. Override the `startEngine()` method to display different messages for each vehicle.

4. Create a Java class `BankAccount` with a method `calculateInterest()`. Derive classes `SavingsAccount` and `CheckingAccount` from `BankAccount` and override the `calculateInterest()` method based on account type.

Abstract

1. Create an abstract class 'Robot' with an abstract method 'movementType() ' and a regular method 'display_movement()'. Derive classes 'Land_robot', and 'Flying_robot' from 'robot' and override the 'movementType()' method.
2. Create an abstract class 'Student' with an abstract method 'motivation() ' and a regular method 'display_motivation()'. Derive classes 'FirstYear', and 'FinalYear' from 'Student' and override the 'motivation()' method.