Assignment 4

Inheritance

1. Design a system for managing employee information using object-oriented principles, specifically focusing on inheritance. Implement a base class Employee with essential attributes such as eid (employee ID), ename (employee name), and salary. The Employee class should have a constructor, setter, getter, display, and a member function to calculate the salary based on the specific employee type.

   Derive three classes from the base class: HR, SalesManager, and Admin. Each derived class should have its own set of attributes and methods, along with inheriting the attributes and methods from the base class.

   Employee Class:

   Attributes:

   eid: Employee ID
   ename: Employee Name
   salary: Basic Salary
   Methods:

   Constructor: Initializes the attributes.
   Setter: Sets values for attributes.
   Getter: Retrieves values of attributes.
   Display: Displays employee information.
   CalculateSalary: Calculates and returns the salary.
   HR Class (Derived from Employee):

   Additional Attributes:

   commission: Commission percentage
   Additional Methods:

   Constructor: Initializes the attributes.
   Setter: Sets values for attributes.
   Getter: Retrieves values of attributes.
   Display: Displays HR-specific information.
   CalculateSalary: method to calculate HR's total salary including commission.
   SalesManager Class (Derived from Employee):

   Additional Attributes:

   target: Sales target
   incentive: Incentive amount
   Additional Methods:
   Constructor: Initializes the attributes.

Setter: Sets values for attributes.
Getter: Retrieves values of attributes.
Display: Displays Sales Manager-specific information.
CalculateSalary: method to calculate Sales Manager's total salary including incentives.
Admin Class (Derived from Employee):

Additional Attributes:

allowance: Allowance amount
Additional Methods:

Constructor: Initializes the attributes.
Setter: Sets values for attributes.
Getter: Retrieves values of attributes.
Display: Displays Admin-specific information.
CalculateSalary: method to calculate Admin's total salary including allowances.

2. Implement an object-oriented system to showcase inheritance in a geometric shapes application. Begin by creating a base class Shape with a common attribute area. Include essential methods such as a constructor, a member function to calculate the area, and another member function to display the shape's information.

   Derive three classes from the base class Shape: Triangle, Circle, and Rectangle. Each derived class should have its own set of attributes (height and base for Triangle, radius for Circle, length and width for Rectangle) and methods. The derived classes must inherit the area attribute and methods from the base class.

   Shape Class (Base Class):

   Attributes:

   area: Area of the shape
   Methods:

   Constructor: Initializes the attributes.
   CalculateArea: Calculates and sets the area based on the shape.
   Display: Displays the shape's information, including the calculated area.
   Triangle Class (Derived from Shape):

   Additional Attributes:

   height: Height of the triangle
   base: Base of the triangle
   Additional Methods:

   Constructor: Initializes the attributes.
   CalculateArea: method to calculate the area of the triangle.
   Display: Overrides the base class method to display triangle-specific information.

Circle Class (Derived from Shape):

Additional Attributes:

radius: Radius of the circle
Additional Methods:

Constructor: Initializes the attributes.
CalculateArea: method to calculate the area of the circle.
Display: Overrides the base class method to display circle-specific information.
Rectangle Class (Derived from Shape):

Additional Attributes:

length: Length of the rectangle
width: Width of the rectangle
Additional Methods:

Constructor: Initializes the attributes.
CalculateArea: method to calculate the area of the rectangle.
Display: Overrides the base class method to display rectangle-specific information.

3. Write a code to implement inheritance where vehicle is base class and derived classes like bike, car, bus etc.
4. Write 2 more codes to show inheritance on your own