18CS2028 C# and .NET Programming Lab

Ex. No: 3	Application using Inheritance and Polymorphism
14.08.2023	

Aim: To develop C# application using inheritance and polymorphism.

Refer Materials
https://www.javatpoint.com/c-sharp-polymorphism

Do the question given below in Hackerrank
https://www.hackerrank.com/challenges/30-inheritance/problem?isFullScreen=true

Also, complete **ONE** question in from the below as per the formula given below
Question Number = (RegNo % 5) + 1
* Take your numerical regno only

1

Develop a C# application using Inheritance as per the following. Create a class called Shape with two double data members that could be used to compute the area of any shape. Include constructor to initialize Shape class data members and methods such as findArea(), calculatePerimeter() and to compute and display the area of Shape. Derive two specific classes called Triangle and Rectangle from the base class **Shape** and override the find_area(), calculatePerimeter() method. Then create a Main class and demonstrate findArea() and calculatePerimeter() computation using polymorphism.

2

Develop a C# application using Inheritance as per the following. Create a class **Worker with name, salary rate as data members** and provide a method ComputePay(int hours) to compute the week pay of every worker. Then create two derived classes **DailyWorker** and **SalariedWorker** from it with additional data no_of_days for **DailyWorker** and no_of_hours is for **SalariedWorker**. A **DailyWorker** is paid on the basis of number of days he/she works. The **SalariedWorker gets** paid the wage for **40** hours a week no matter what actual hours is. Implement this scenario to calculate the pay of workers using method overriding. You are expected to use the concept of Inheritance with **proper run time polymorphism** with menu driven options.

3

Develop a C# application using Inheritance as per the following. Create a base class called **CashTree** which demonstrate any **ATM**. Have attributes like atmname, location and include functionalities like viewBalance, withdraw and deposit in base class. Derive two derived classes **SBI_Bank**, and **HDFC_Bank** with additional properties such as **cust_name, accno, balance** and override those base class functionalities according to the following table. Complete the above scenario using Inheritance, Method Overriding and Polymorphism with Menu driven options.

	SBI_BANK	**HDFC_BANK**
Additional Data	cust_name,accno,balance, servicecharge, interestrate	cust_name,accno,balance, servicecharge, interestrate
Withdraw	servicecharge = 5 rupees	servicecharge = 10 rupees
Deposit	interest_rate = 6%	interest_rate = 4%

4

Create an application using C# inheritance. Design a base class called **Cake** with data such as name, flavor, and price. Include constructor to initialize the data and method called **CalculatePrice()** which will display base price. Create two derived classes **OrderCake** and **ReadyMadeCake** with additional data as given in the following table. Override the method **CalculatePrice()** in both derived classes as per the price calculation given in the table. In Main Class demonstrate the **CalculatePrice()** functionality using **Polymorphism** with menu options.

	OrderCake	**ReadyMadeCake**
Additional Data	weight(kg)	quantity
Price Calculation	price * weight	price * quantity

5

Design a base class called **Employee** with data such as name, empid, and basicSalary. Include constructor to initialize the data and include a method called **CalculateSalary()** which will display basicSalary. Create two derived classes **Manager** and **Engineer** with additional data as given in the following table. Override the method CalculateSalary**()** in both derived classes as per the salary calculation given in the table. In Main Class demonstrate the **CalculatePrice()** functionality using **Polymorphism.**

	Manager	**Engineer**
Additional Data	incentive, hra	Incentive, TA
Salary Calculation	basicSalary + incentive + hra	basicSalary + incentive +TA