**Object Oriented Programming**

**Fall 2022**

**Lab 09**

**Instructions:**

* Comment your code.
* Use meaningful variable names.
* Plan your code carefully on a piece of paper before you implement it.
* Name of the program should be same as the task name. i.e. the first program should be Task\_1.cpp
* **void main() is not allowed. Use int main()**
* **You are not allowed to use system**("**pause**")
* **You are not allowed to use any built-in functions**
* **You are required to follow the naming conventions as follow:**

**Variables:** firstName; (no underscores allowed)

**Function:** getName(); (no underscores allowed)

**ClassName:** BankAccount (no underscores allowed)

**Students are required to complete the following tasks in lab timings.**

**Task#01**

Write a C++ class named as **shape** that have:

a. Two protected data members “**width**” and “**height**”.

b. Implement “**setWidth**” and “**setHeight**” member functions.

c. Inherit rectangle class from shape class with a function “**getArea**” that calculated area of rectangle.

d. Inherit square class from shape class with a function “**getArea**” that calculated area of square.

e. In main function assign values to required variables for area calculation and print total area for both square and rectangle.

**Task#02**

write a C++ program with following classes:

**a.** **“BasicInfo”**

1. protected data members name(char), empId(int), gender(char).

2. Public member function “**getBasicInfo”** that takes name,empid and gender from user.

**b.** **“DepartmentInfo”**

1. Protected data members deptName(char), assignedWork(char), time2complete(int).

2. Public member function “**getDeptInfo”** that takes deptName, assignedWork and time2complete from user.

**c.** **“Employee”**

1. Must be inherited from class “BasicInfo**”** and **“DepartmentInfo”.**

2. public data member “**getEmployeeInfo**” that calls “**getBasicInfo**” and “**getDeptInfo**” thus makes system to prompt inputs from user.

3. public data member “**printEmployeeInfo**” that prints all inputs entered by user.

4. Call **getEmployeeInfo** and **printEmployeeInfo** from main.

**Task 3:**

You have a class Person which has the following attributes as its private member variables.

• name (char\*)

• age (int)

Write a parameterized constructor to initialize the values. You have an Employee class which is publicly inherited from the Person class. It has the following attributes:

• salary (double)

• employeeId (int)

You have another class BaseballPlayer publically inherited from the Person class. BaseballPlayer has the following attributes:

• battingAverage (double)

• totalRuns (int)

Make an object of BaseballPlayer class in main and initialize values of name, age,battingAverage and totalRuns Now, make an Employee class object in main and initialize values of name, age, employeeId and salary. Count the total number of Employees and Baseball players and display the count

**Task 4:**

Create a base class, called BankAccount, and two additional classes (each derived from BankAccount), called SavingsAccount and CheckingAccount.

**BankAccount:**

* Title
* AccountNumber
* Balance
* Deposit()
* Withdraw()

**SavingAccount:**

* InterestRate
* CalculateInterest()

**CheckingAccount:**

* fee charged per transaction

Class CheckingAccount should redefine member functions withdraw and deposit so that they subtract the fee from the account balance whenever either transaction is performed successfully.

You will then test the operations of each class in function main() to simulate the transactions of both a checking account and a savings account.