Lab Task2

Visual Programming

Q1.

[Classes]

Imagine a tollbooth at a bridge. Cars passing by the booth are expected to pay a 50 Rs. Toll. Mostly they do, but sometimes a car goes by without paying. The tollbooth keeps track of the number of cars that have gone by, and of the total amount of money collected. Model this tollbooth with a class called tollbooth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both of these to 0. A member function called payingCar () increments the total car and adds 5 to the cash total. Another function called nopayCar (), increments the car total but adds nothing to the cash total. Finally a member function called display () displays the two totals. Make appropriate member function’s constant. Include a program to test the class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the Esc key should cause the program to print out the total cars and total cash and then exit.

[Inheritance + Polymorphism]

Design a class named ***Person*** and its two derived classes named ***Student*** and ***Teacher***.

The ***Person*** class has

* Attributes i.e. name, age, phone number, and e-mail address
* Behavior i.e. work something

The ***Student*** class has

* Attributes i.e. registration ID, department, number of completed credit hours
* Behavior i.e. pay course registration fee

The class named ***Teacher*** contains the following

* Attributes i.e. staff ID, salary
* Behavior i.e. teach course(s)
* Implement Function Overriding and Overloading throughout the JAVA program.

Q2. Consider a base class named Employee in JAVA and its derived classes HourlyEmployee and PermanentEmployee while taking into account the following criteria.

 Employee class has two data fields i.e. a name (of type string) and specific ID (of type integer)

 Both classes (HourlyEmployee and PermanentEmployee) have an attribute named hourlyIncome

 Both classes (HourlyEmployee and PermanentEmployee) have three-argument constructor to initialize the hourlyIncome as well as data fields of the base class

 Class HourlyEmployee has a function to calculate the hourly income of an employee for the actual number of hours he or she worked. One hour income is Rs. 150

 Similarly, PermanentEmployee class has function to calculate the income of an employee that gets paid the salary for exact 240 hours, no matter how many actual hours he or she worked.

Again, one hour salary is Rs. 150.

Implement all class definitions with their respective constructors to initialize all data members and functions to compute the total income of an employee. In the main() function, create an instance of both classes (i.e. HourlyEmployee and PermanentEmployee) and test the working of functions that calculate total income of an employee.