Object Oriented Programming

Home Work 11 **Marks 10**

Instructions

Work on this home work individually. Absolutely NO collaboration is allowed. Any traces of plagiarism would result in a ZERO marks in this homework and possible disciplinary action. Tasks should be coded in **C++**.

Due Date

Paste the solution of the problem (source code .cpp file only) labeled with your complete roll number in SEM – HW 11 and SEA – HW 11 folders for SE Morning and SE Afternoon sections respectively on Wednesday, June 01, 2016 before 05:00 PM. These folders are available at \\printsrv\Teacher Data\Umair Babar\Students.

Feel free to include any additional member functions in any of the classes that can help you to fulfill your required working.

Case Study: Package Inheritance Hierarchy

Package-delivery services, such as OCS®, TCS® and JCS®, offer a number of different shipping options, each with specific costs associated.

Create an inheritance hierarchy to represent various types of packages. Use **Package** as the base class of the hierarchy, and then include classes **TwoDayPackage** and **OvernightPackage** that derive from **Package**.

1. ADT: Package

1. The class should have following **private data members**
    1. Two **strings** to represent the **name** of the **sender** and **receiver**.
    2. Two **strings** to hold the **address** of the **sender** and **receiver**.
    3. Two **strings** to contain the **city** of the **sender** and **receiver**.
    4. A **float** named **weight** to store the **weight** of the package in **ounce**.
    5. A **float** named **costPerOunce** to store the **cost per ounce** of the package.
2. A **constructor** which accepts the **names**, **addresses**, **cities** of the **sender** and **receiver** and the **weight** and its **cost per ounce** as arguments and assigns them to the **appropriate member variables**. Ensure that the **weight** and **cost per ounce** contain **positive values**.
3. **calculateCost** member function that **returns** the **cost** associated with shipping the package, i.e. **weight * costPerOunce**.

2. ADT: TwoDayPackage

1. The class should have **private data member** of type **float** named **flatFee** to represent the company charges for **two-day-delivery** service.
2. A **constructor** which accepts all the required information for the two-day-delivery package including the **flatFee** as arguments and assigns them to the **appropriate member variables**. Ensure that the **flatFee** contains **positive value**.
3. **calculateCost** member function that **computes and return** the **shipping cost** by adding the **flat fee** to the weight-based cost calculated by base class **Package's calculateCost** function.

3. ADT: OvernightPackage

1. The class should have **private data member** of type **float** named **feePerOunce** to represent the additional cost charged for overnight-delivery service.
2. A **constructor** which accepts all the required information for the overnight package including the **additional fee per ounce** as arguments and assigns them to the **appropriate member variables**. Ensure that the **fee per ounce** contains **positive value**.
3. **calculateCost** member function that **adds** the additional **fee per ounce** to the standard **cost per ounce** before calculating the shipping cost and then **computes and return** the **shipping cost**.

4. Main Function

Once you have written your classes, write **main** function and test the functionality of each of the classes thoroughly by creating their objects.

NOTE: - No submission will be accepted after the due date and time.

BEST OF LUCK