

Homework 10

- Due Date:** Monday 21 April 2014 11:59 PM MST
Note: If you submit after the due date (but before the hard deadline), your submission score will be penalized by 20%.
- Hard Deadline:** Monday 21 April 2014 11:59 PM MST
Note: If you submit any time after the hard deadline, you will not receive credit.

**Problem 01 (30 points)**

Package-delivery services, such as FedEx®, DHL® and UPS®, offer a number of different shipping options, each with specific costs associated. Create an inheritance hierarchy to represent various types of packages. Use class **Package** as the base class of the hierarchy, then include classes **TwoDayPackage** and **OvernightPackage** that derive from **Package**. **Homework10P01.cpp** is provided to implement the class **Package**. Base class **Package** includes data members representing the name, address, city, state and ZIP code for both the sender and the recipient of the package, in addition to data members that store the weight (in ounces) and cost per ounce to ship the package. Package's constructor initializes these data members. Two member functions, **setWeight()** and **setCostPerOunce()**, are implemented to ensure that the weight and cost per ounce contain positive values. A public member function **calculateCost()** is implemented that returns a double indicating the cost associated with shipping the package. **Package**'s **calculateCost** function determines the cost by multiplying the weight by the cost per ounce. You are required to implement the following items:

- Implement a derived class **TwoDayPackage** that inherits the functionality of base class **Package**, but also include a data member that represents a flat fee that the shipping company charges for two-day-delivery service. **TwoDayPackage**'s constructor should receive a value to initialize this data member. **TwoDayPackage** should redefine member function **calculateCost** so that it computes the shipping cost by adding the flat fee to the weight-based cost calculated by base class **Package**'s **calculateCost** function.
- Implement a derived class **OvernightPackage** that inherits directly from class **Package** and contain an additional data member representing an additional fee per ounce charged for overnight-delivery service. **OvernightPackage** should redefine member function **calculateCost** so that it adds the additional fee per ounce to the standard cost per ounce before calculating the shipping cost.
- Write a test program that creates objects of each type of **Package** and tests member function **calculateCost**.