Assignment 10
Reading and Programming Project due 12/3

Reading Assignment

This assignment is based on the material presented in Chapter 4 and Sections 5.1-5.3, 5.5 and 6.1-6.3. Also review Handouts 11 and 12.

Programming Assignment

ShoppingList: Create a shopping list due 11:00 p.m. on Saturday, 12/3 worth 14 points

The goal of this assignment is to create a program that

• prints out a catalog of shopping items,
• helps the user assemble a shopping list from the catalog.

The program should work as follows. First it should print out a list of available items, and then let the user enter one of the following commands:

1. A for Adding a new item to the shopping cart,
2. T for printing the the Total gross amount due for the purchase, assuming tax rate of 5% on taxable items,
3. P for Printing out the contents of the entire shopping cart,
4. S for Stop. At the stop command the total amount due for the purchase should be displayed and the program should terminate.

If the user enters something other than A, T, P or S no action should be taken and the next command should be read.

We will make the following simplifying assumption: the user can purchase no more than 10 different items and at most one of each.

The following sample interaction demonstrates the program in action (note that the catalog is deliberately short here, for the presentation purposes):

Greetings! The following items are available in the store:
Roomba - a robotic vacuum - $200.00 (taxable)
Eat Me! - a giant chocolate bar - $29.40 (non-taxable)
CD-Player - portable CD-player - $50.00 (taxable)
Clock-Radio - AM/FM radio with built-in clock and alarm - $20.00 (taxable)

You may start shopping now.
The commands are as follows: A for Adding an item, T for displaying the total amount due for the purchase
P for Printing the list of items and S and displaying the total amount due and Stopping.

Please enter the next command (A,T,P or S): A
What is the name of this item? CD-Player
Added to the shopping list.

Please enter the next command (A,T,P or S): A
What is the name of this item? Clock-Radio
Added to the shopping list.

Please enter the next command (A,T,P or S): T
The total amount due is $73.50

Please enter the next command (A,T,P or S): A
What is the name of this item? Eat Me!
Added to the shopping list.

Please enter the next command (A,T,P or S): P
Contents of the shopping list:
CD-Player - portable CD-player - $50.00 (taxable)
Clock-Radio - AM/FM radio with built-in clock and alarm - $20.00 (taxable)
Eat Me! - a giant chocolate bar - $29.40 (non-taxable)

Please enter the next command (A,T,P or S): S
The total amount due is $102.90

Program design:
The entire program should consist of 3 files:

1. CatalogItem.java class from the previous assignment. You can either use your own solution, or the one that will be posted on the course web-site after the late deadline, i.e. on Sunday.

2. Catalog.java posted on the course website. This file contains a static method items() that returns an array of catalog items. The Catalog class uses class CatalogItem to create the array. It assumes the constructor of the CatalogItem class has the following interface:

   
   CatalogItem(String itemName, String itemDescription, double itemPrice, boolean isTaxable, int quantity)

   Note that to work with your own definition of CatalogItem class, your CatalogItem class must include a constructor with the same interface (i.e. parameter list).
3. **ShoppingList.java** - defined entirely by you and implementing the container class of CatalogItems included in the shopping list. The structure of this class and its relationship to `CatalogItem` class is similar to the structure of the `Department` and `Employee` classes.

The instance variables of ShoppingList should include an array representing the catalog and another array representing the selected items from the catalog.

ShoppingList class should include definitions of the following instance methods:

- a constructor that is passed an array representing the catalog, and that creates an empty shopping list.
- `addItem()` - a method that is passed an item name, and that adds that item to the list of purchased items,
- `printList()` - a method that prints the contents of the shopping list as shown in the sample interaction.
- `totalDue()` - a method that computes the total amount due for the purchase.

**ShoppingList.java** should also implement the main method for the entire application that

- Obtains and prints out the catalog (using the appropriate methods of classes Catalog and CatalogItem.java).
- Creates a new object of class ShoppingList.
- Runs the main program loop as it is described in the interaction.