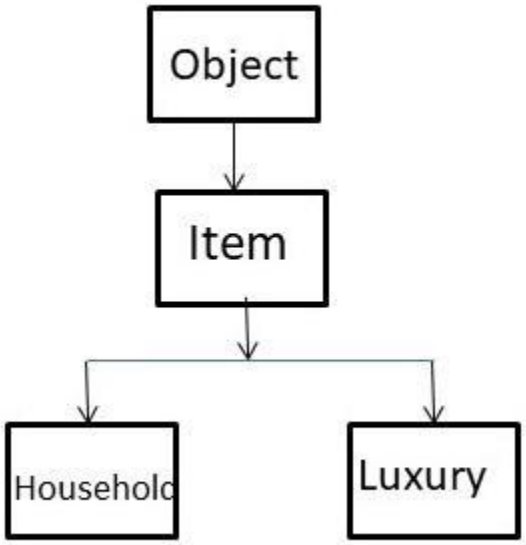
Java AP Homework

Mr. Neat

Mr. Levering Question:

A set of classes is used to represent various items that are available for purchase. All of the items are taxable and are referred to as *Item*. The purchase price of an *Item* is computed from its list price and its tax rate. The class hierarchy is shown in the diagram below.



The definition of the abstract *Item* class is shown below.

```
public abstract class Item{
	private double taxRate;
	private String name;

	public abstract double getListPrice();

	public Item(double rate, String n)
	{
		taxRate = rate;
		name = n;
	}

	public String getName()
	{
		return name;
	}

	public double purchasePrice()
	{
		/* to be implemented in part (a) */
	}

	public String toString()
	{
		return "The "+ getName() + " purchase price is: $"+ purchasePrice();
	}
}
```

(a) Write the *Item* method *purchasePrice*. The purchase price of an *Item* is its list price plus the tax on the item. The tax is computed by multiplying the list price by the tax rate. For example, if the tax rate is 0.10 (representing 10%), the purchase price of an *Item* with a list price of $6.50 would be $7.15.
The *purchasePrice* method header is:

public double purchasePrice()

(b) Create a *Household* class, which extends the Item class. The list price for the *Household* class is the dealer cost. For example, if a banana has a dealer cost of $2.50 and a tax rate of 0.1 then the list price and the purchase price are the same and would be $2.50 + $0.25 = $2.75.

Your class should have a constructor that takes an item name, dealer cost, and the tax rate as parameters. Provide any private instance variables (class variables) needed and implement all necessary methods.

(c) Create a *Luxury* class, which extends the *Item* class. A *Luxury* has two parts to its list price: a dealer cost and dealer markup since it is a luxury item. The list price of a Luxury is the sum of the dealer cost and the dealer markup.

For example, if a yacht has a dealer cost of $20,000.00, a dealer markup of $2,500.00 and a tax rate of 0.10, then the list price of the yacht would be $22,500.00 and the purchase price (including tax) would be $24,750.00. If the dealer markup were changed to $1,000.00, then the list price of the yacht would be $21,000.00 and the purchase price would be $23,100.00.

Your class should have a constructor that takes an item name, dealer cost, the dealer markup, and the tax rate as parameters. Provide any private instance variables (class variables) needed and implement all necessary methods. Also provide a public method changeMarkup, which changes the dealer markup to the value of its parameter.

(d) Given the following psvm, what is the program output?

```
   import java.util.ArrayList;
class temp {
      public static void main(String args[])
      {
                        ArrayList<Item> j = new ArrayList<Item>();
                        j.add(new Luxury("yacht",2000.00,400.00,.1));
                        j.add(new Household("banana",1.50,.2));
                        j.add(new Household("tp", 8.00,.05));
                        System.out.println(j);
      }
}
```