CS163/164: Worksheet More Classes
Name(s):_____

Analyze the class Product presented below to answer the following questions:

a. Identify the instance variables, how many are they and what are their types and names?
b. Do we have any class variables?
c. Is the constructor method overloaded? Explain your answer.
d. What is the minimum price for a product when you create an object? How do you know that?
e. What is the minimum quantity for a product? How do you know that?
f. What do the method changePrice does?
g. What do the toString method does?

```
public class Product {
    private String name;
    private double price;
    private int quantity;
    private final static double VALUE = 0.1;
    public Product(String name){
        setName(name);
        setPrice(9.99);
        setQuantity(1);
    }
    public Product(String name, double price, int quantity){
        setName(name);
        setPrice(price);
        setQuantity(quantity);
    }
    public void setName(String name){
        this.name = name;
    }
    public void setPrice(double price){
        if(price < 9.99) this.price = 9.99;
        else this.price = price;
    }
    public void setQuantity(int quantity){
        if(quantity < 1) this.quantity = 1;
        else this.quantity = quantity;
    }
    public String getName(){
        return name;
    }
    public double getPrice(){
        return price;
    }
    public int getQuantity(){
        return quantity;
    }
    public void changePrice(){
        double value = price * VALUE;
        price += value;
    }
    public String toString(){
        String msg = String.format("Name: %s, Price: %.2f, Quantity: %d\n", name,
price, quantity);
        return msg;
    }
}
```

Analyze the classes presented below to answer the following questions:

a. Identify their instance variables and class variables if they exist.
b. Identify constant values, if they exist.

c. Explain what each method is doing.

```
public class Store {
    private String name;
    private Product p1, p2, p3;
    public Store(String name){
        this.name = name;
        p1=p2=p3=null;
    }
    public String getName(){         return name;      }
    public boolean addProduct(String name, double price, int quantity){
        if(p1 != null && p2 !=null && p3 != null)
            return false;
        Product p = new Product(name,price, quantity);
        if(p1 == null) p1 = p;
        else if(p2 == null) p2 = p;
        else if(p3 == null) p3 = p;
        return true;
    }
    public void randomChange(String name){
        if(p1 != null && name.equalsIgnoreCase(p1.getName()))
            p1.changePrice();
        else if(p2 != null && name.equalsIgnoreCase(p2.getName()))
            p2.changePrice();
        else if(p3 != null && name.equalsIgnoreCase(p3.getName()))
            p3.changePrice();
    }
    public String toString(){
        String msg = name + "\n";
        if(p1!=null) msg += p1.toString() + "\n";
        if(p2!=null) msg += p2.toString() + "\n";
        if(p3!=null) msg += p3.toString() + "\n";
        if(msg.equals(name + "\n")) return "No Products in Store!\n";
        return msg;
    }
}
```

```
import java.util.Scanner;

public class AppStore {
    private Store store;
    private final Scanner scanner;
    public AppStore(String name){
        store = new Store(name);
        scanner = new Scanner(System.in);
    }
    public void printMenu() {
        System.out.println("Type \"X\" to exit at any time.");
        System.out.println("[A]dd products");
        System.out.println("[L]ist products");
        System.out.println("[C]hange price");
        System.out.println();
    }

    public void go(){
        printMenu();
        System.out.println("What would you like to do?");
        String action = scanner.nextLine().toLowerCase();
        while(!action.startsWith("x")) {
            if (action.startsWith("a")) {
                System.out.println("Enter the name of the product: ");
                String name = scanner.nextLine().toLowerCase();
```

```
                System.out.println("Enter the price of the product: ");
                double price = scanner.nextDouble();
                System.out.println("Enter the quantity of the product: ");
                int quantity = scanner.nextInt();
                if(store.addProduct(name, price, quantity))
                    System.out.println("Product added!");
                else System.out.println("Could not add product, store is full!");
            } else if (action.startsWith("l")) {
                System.out.println(store.toString());
            } else if (action.startsWith("c")) {
                System.out.println("Enter the name of the product you will randomly
change the price: ");
                String name = scanner.nextLine().toLowerCase();
                store.randomChange(name);
            } else {
                System.out.println("Please enter a valid command.");
            }
            printMenu();
            System.out.println("What would you like to do?");
            action = scanner.nextLine().toLowerCase();
        }
    }
    public static void main(String args[]){
        AppStore app = new AppStore("STORE");
        app.go();
    }
}
```