Isaac Ray Shoebottom
CS 1073 (FR02A)
Assignment 8
3429069

Section A

Source Code (Customer.java):

```java
import java.text.NumberFormat;

import java.util.Locale;


/**

 * The customer class holds the name and car and methods relating to costs
and last time visited

 * @author Isaac Shoebottom (3429069)

 */


public class Customer {

    /**

     * (String) customer name

     */

    private final String customer;

    /**

     * (String) car name

     */

    private final String car;

    /**

     * (long) The time in months since the last time the customer has visited

     */

    private long monthsSinceVisit = 0;


    /**

     * Currency formatter

     */

    NumberFormat cf = NumberFormat.getCurrencyInstance(Locale.CANADA);


    /**

     * The constructor for the customer class, stores the customers name and
car model
```

```java
 * @param customer The customers name
 * @param car The customers car model
 */
Customer(String customer, String car) {

    this.customer = customer;

    this.car = car;

}


/**
 * Increases the months since the last time the customer has visited
 */
void incMonthsSinceVisit() {

    monthsSinceVisit++;

}


/**
 * Get the months since the last time the customers has visited
 * @return The months since the last time the customer has visited
 */
long getMonthsSinceVisit() {

    return monthsSinceVisit;

}


/**
 * The cost of the next visit
 * @return The cost of the next visit in double format
 */
double getNextVisitCost() {

    return (20.00 + (monthsSinceVisit*12.00));

}


/**
```

```java
     * Create an invoice containing the customers name, car model, last time
the visited and the cost of the visit

     * @return A string containing the customers name, car model, last time
the visited and the cost of the visit

     */

    String createVisitInvoice() {

        double cost = getNextVisitCost();

        long lastVisit = getMonthsSinceVisit();

        monthsSinceVisit = 0;

        return (

                "INVOICE\tfor: " + customer + "\n" +

                "\t\tmodel:  " + car + "\n" +

                "\t\tlast visit: " + lastVisit + "\n" +

                "\t\tnext visit cost: " + cf.format(cost));

    }

}
```

Source Code (WarrantyCustomer.java:

```java
/**

 * This class contains a customer that has a warranty. It contains the
customers name, car model and overridden methods pertaining to that the
customer is a warranty owner

 * @author Isaac Shoebottom (3429069)

 */



public class WarrantyCustomer extends Customer {

    /**

     * (long) The time since the last discount for being a warrenty owned was
applied

     */

    private long monthsSinceLastDiscount = 0;



    /**

     * Warranty customer constructor, it stores the customers name and car
model

     * @param customer The customers name

     * @param car The customers car model

     */

    WarrantyCustomer(String customer, String car) {

        super(customer, car);

    }



    /**

     * The overridden method that applies a discount if the user has not used
their discount in 12 months

     * @return The cost of the visit

     */

    @Override

    double getNextVisitCost() {

        if (monthsSinceLastDiscount >= 12) {

            monthsSinceLastDiscount = 0;
```

```java
            return (0.8 * super.getNextVisitCost());

        }

        return super.getNextVisitCost();

    }


    /**
     * Method specific to the warranty owners, increases the months since
last discount as well as months since last visit
     */
    @Override
    void incMonthsSinceVisit() {

        super.incMonthsSinceVisit();

        monthsSinceLastDiscount++;

    }


    /**
     * Create an invoice for warranty owners, includes the months since the
last time the discount was applies
     * @return The customers invoice, includes the last time the warranty
discount was applied
     */
    @Override
    String createVisitInvoice() {

        long tempMonthsSinceLastDiscount = monthsSinceLastDiscount;

        return(

                super.createVisitInvoice() +

                "\n\t\tmonths since discount: " + tempMonthsSinceLastDiscount
+ "\t(has warranty)"

                );

    }

}
```

Section B

Output:

```
*******************************
* HARRISON FORD CUSTOMER SYSTEM *
*******************************
November 1, 2019
----------------
INVOICE    for: John Smith
           model:  Escape
           last visit: 1
           next visit cost: $32.00


INVOICE    for: Harold Lee
           model:  Fiesta
           last visit: 3
           next visit cost: $56.00
           months since discount: 3    (has warranty)


INVOICE    for: Beth Blart
           model:  Focus
           last visit: 4
           next visit cost: $68.00
           months since discount: 4    (has warranty)
```

November 1, 2020

INVOICE   for: John Smith

            model: Escape

            last visit: 12

            next visit cost: $164.00

INVOICE   for: Harold Lee

            model: Fiesta

            last visit: 0

            next visit cost: $20.00

            months since discount: 3   (has warranty)

INVOICE   for: Beth Blart

            model: Focus

            last visit: 12

            next visit cost: $131.20

            months since discount: 16   (has warranty)