

Change for lab1: [5 points lost]

1. Make all the variables private in all classes (Automobile/OptionSet/Option)
2. Put the Option class inside the OptionSet class as a inner class
3. Add more methods for Automobile class

Apply for taking back 5 points — —> test1(page 2)

Change for lab4: [2 points lost]

1. Modify the test code
2. Complete the documentation

Apply for taking back 2 points — —> test2/test3(page3/page4)

## Test1: driver.Driver1.java

Test goal: Test functionality of FileIO after change the Automobile class and OptionSet class

Result: After adding the Option class into OptionSet class(left), there is no difference comparing to storing them in different file(right).

```
The year of the vehicle is:2004
The make of the vehicle is:Focus
The model of the vehicle is: Focus Wagon ZTW
The base price of the vehicle is: 18445
The optionset name is: Color
The option name is: Fort Knox Gold Clearcoat Metallic
The Price is: 0
The option name is: Liquid Grey Clearcoat Metallic
The Price is: 0
The option name is: Infra-Red Clearcoat
The Price is: 0
The option name is: Grabber Green Clearcoat Metallic
The Price is: 0
The option name is: Sangria Red Clearcoat Metallic
The Price is: 0
The option name is: French Blue Clearcoat Metallic
The Price is: 0
The option name is: Twilight Blue Clearcoat Metallic
The Price is: 0
The option name is: CD Silver Clearcoat Metallic
The Price is: 0
The option name is: Pitch Black Clearcoat
The Price is: 0
The option name is: Cloud 9 White Clearcoat
The Price is: 0
The optionset name is: Transmission
The option name is: automatic
The Price is: 0
The option name is: manual
The Price is: -815
The optionset name is: Brakes/Traction Control
The option name is: Standards
The Price is: 0
The option name is: ABS
The Price is: 400
The option name is: ABS with Advance Trac
The Price is: 1625
The optionset name is: Side Impact Air Bags
The option name is: present
The Price is: 0
The option name is: not present
The Price is: 350
The optionset name is: Power Moonroof
The option name is: present
The Price is: 0
The option name is: not present
The Price is: 595
model.Automobile@2e0fa5d3

Process finished with exit code 0
```

```
The type of the vehicle is:Sedan
The year of the vehicle is:2004
The make of the vehicle is:Focus
The model of the vehicle is: Focus Wagon ZTW
The base price of the vehicle is: 18445
The optionset name is: Color
The option name is: Fort Knox Gold Clearcoat Metallic
The Price is: 0
The option name is: Liquid Grey Clearcoat Metallic
The Price is: 0
The option name is: Infra-Red Clearcoat
The Price is: 0
The option name is: Grabber Green Clearcoat Metallic
The Price is: 0
The option name is: Sangria Red Clearcoat Metallic
The Price is: 0
The option name is: French Blue Clearcoat Metallic
The Price is: 0
The option name is: Twilight Blue Clearcoat Metallic
The Price is: 0
The option name is: CD Silver Clearcoat Metallic
The Price is: 0
The option name is: Pitch Black Clearcoat
The Price is: 0
The option name is: Cloud 9 White Clearcoat
The Price is: 0
The optionset name is: Transmission
The option name is: automatic
The Price is: 0
The option name is: manual
The Price is: -815
The optionset name is: Brakes/Traction Control
The option name is: Standards
The Price is: 0
The option name is: ABS
The Price is: 400
The option name is: ABS with Advance Trac
The Price is: 1625
The optionset name is: Side Impact Air Bags
The option name is: present
The Price is: 0
The option name is: not present
The Price is: 350
The optionset name is: Power Moonroof
The option name is: present
The Price is: 0
The option name is: not present
The Price is: 595
model.Automobile@5010be6

Process finished with exit code 0
```

## Test2: driver.Driver4.java

**Test goal:** Test to ensure that two threads altering same property does not cause data corruption

**Result:** After running for several times, data corruption happened(**left**), comparing to the expecting result(**right**).

```
The type of the vehicle is:Sedan
The year of the vehicle is:2004
The make of the vehicle is:Focus
The model of the vehicle is: Focus Wagon ZTW
The base price of the vehicle is: 18445
The optionset name is: Color
The option name is: Fort Knox Gold Clearcoat Metallic
The Price is: 0
Start thread 0 updateOptionPrice
Entering updateOptionPrice method
***Option:present , New Price:100***
updateOptionPrice Notifyall
updateOptionPrice Done!
Stopping thread 0
Entering updateOptionPrice method
***Option:present , New Price:500***
updateOptionPrice Notifyall
updateOptionPrice Done!
Stopping thread 0
The option name is: Liquid Grey Clearcoat Metallic
The Price is: 0
The option name is: Infra-Red Clearcoat
The Price is: 0
The option name is: Grabber Green Clearcoat Metallic
The Price is: 0
The option name is: Sangria Red Clearcoat Metallic
The Price is: 0
The option name is: French Blue Clearcoat Metallic
The Price is: 0
The option name is: Twilight Blue Clearcoat Metallic
The Price is: 0
The option name is: CD Silver Clearcoat Metallic
The Price is: 0
The option name is: Pitch Black Clearcoat
The Price is: 0
The option name is: Cloud 9 White Clearcoat
The Price is: 0
The optionset name is: Transmission
The option name is: automatic
The Price is: 0
The option name is: manual
The Price is: -815
The optionset name is: Brakes/Traction Control
The option name is: Standards
The Price is: 0
The option name is: ABS
The Price is: 400
The option name is: ABS with Advance Trac
The Price is: 1625
The optionset name is: Side Impact Air Bags
The option name is: present
The Price is: 0
The option name is: not present
The Price is: 350
The optionset name is: Power Moonroof
The option name is: present
The Price is: 500 ←
The option name is: not present
The Price is: 595
```

```
Start thread 0 updateOptionPrice
Entering updateOptionPrice method
Start thread 0 updateOptionPrice
The type of the vehicle is:Sedan
The year of the vehicle is:2004
The make of the vehicle is:Focus
The model of the vehicle is: Focus Wagon ZTW
The base price of the vehicle is: 18445
***Option:present , New Price:500***
updateOptionPrice Notifyall
Entering updateOptionPrice method
updateOptionPrice Done!
The optionset name is: Color
Stopping thread 0
The option name is: Fort Knox Gold Clearcoat Metallic
The Price is: 0
***Option:present , New Price:100***
updateOptionPrice Notifyall
updateOptionPrice Done!
The option name is: Liquid Grey Clearcoat Metallic
The Price is: 0
Stopping thread 0
The option name is: Infra-Red Clearcoat
The Price is: 0
The option name is: Grabber Green Clearcoat Metallic
The Price is: 0
The option name is: Sangria Red Clearcoat Metallic
The Price is: 0
The option name is: French Blue Clearcoat Metallic
The Price is: 0
The option name is: Twilight Blue Clearcoat Metallic
The Price is: 0
The option name is: CD Silver Clearcoat Metallic
The Price is: 0
The option name is: Pitch Black Clearcoat
The Price is: 0
The option name is: Cloud 9 White Clearcoat
The Price is: 0
The optionset name is: Transmission
The option name is: automatic
The Price is: 0
The option name is: manual
The Price is: -815
The optionset name is: Brakes/Traction Control
The option name is: Standards
The Price is: 0
The option name is: ABS
The Price is: 400
The option name is: ABS with Advance Trac
The Price is: 1625
The optionset name is: Side Impact Air Bags
The option name is: present
The Price is: 0
The option name is: not present
The Price is: 350
The optionset name is: Power Moonroof
The option name is: present
The Price is: 100 ←
The option name is: not present
The Price is: 595
```

### Test3: driver.Driver5.java

**Test goal:** Test to ensure that two threads altering same property does not cause data corruption

**Result:** After running for several times, no data corruption happened. The code comparison shown as below.

```
package driver;
import adapter.BuildAuto;
import scale.IEditOptions;

/**
 * // Test to ensure that two threads altering same property does not cause data corruption
 * // buildAuto.printAuto("Focus Wagon ZTW");
 */
public class Driver4 {

    public static void main(String[] args) {

        // Instantiating BuildAuto
        BuildAuto buildAuto = new BuildAuto();
        buildAuto.buildAuto( filename: "Focus.txt", filetype: "txt");

        // Create two threads of EditOptions that will modify the static LinkedHashMap Aut
        IEditOptions editThread1 = new BuildAuto();
        IEditOptions editThread2 = new BuildAuto();

        System.out.println("Update Power Moonroof: present to $500");
        editThread2.editOptionPrice( modelName: "Focus Wagon ZTW", optionSetName: "Power Mo
        System.out.println("Update Power Moonroof: present to $100");
        editThread1.editOptionPrice( modelName: "Focus Wagon ZTW", optionSetName: "Power Mo

        // Test to ensure that two threads altering same property does not cause data corrup
        buildAuto.printAuto( Modelname: "Focus Wagon ZTW");

    }
}

package driver;
import adapter.BuildAuto;
import scale.IEditOptions;

/**
 * // Test to ensure that two threads altering same property does not cause data corruption
 * // buildAuto.printAuto("Focus Wagon ZTW");
 */
public class Driver5 {

    public static void main(String[] args) {

        // Instantiating BuildAuto
        BuildAuto buildAuto = new BuildAuto();
        buildAuto.buildAuto( filename: "Focus.txt", filetype: "txt");

        // Create two threads of EditOptions that will modify the static LinkedHashMap Aut
        IEditOptions editThread1 = new BuildAuto();
        IEditOptions editThread2 = new BuildAuto();

        try {
            System.out.println("Update Power Moonroof: present to $500");
            editThread2.editOptionPrice( modelName: "Focus Wagon ZTW", optionSetName: "Power
            Thread.sleep( millis: 100);
            System.out.println("Update Power Moonroof: present to $100");
            editThread1.editOptionPrice( modelName: "Focus Wagon ZTW", optionSetName: "Power

        } catch (InterruptedException e) {
            e.printStackTrace();
        }

        // Test to ensure that two threads altering same property does not cause data corrup
        buildAuto.printAuto( Modelname: "Focus Wagon ZTW");

    }
}
```