CIS 36B – 14th Class / Lab Assignment – **10 Points-**

Student Name________________________________ **Student ID**______________________________ **Point Total**

Pg. 306, Java Programming *A comprehensive Introduction*

Section 1: Define / Answer

comparator-A comparison function, which imposes a *total ordering* on some collection of objects. Comparators can be passed to a sort method (such as `Collections.sort` or `Arrays.sort`) to allow precise control over the sort order. Comparators can also be used to control the order of certain data structures (suc h as`sorted sets` or `sorted maps`), or to provide an ordering for collections of objects that don't have a`natural ordering`.

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Task 1:

USE OBJECT ORIENTATED PROGRAM DESIGN TO SOLVE PROBLEM

Update Assignment #11-13, Task 1.

You can re-create your program in one package for this expansion.

Create 1 “Programmer Created” Class to read student data from the text file, and create student objects. (Objects will need to be stored in a data structure)

Create a class Student. Containing First Name, Last Name, private DOB, Social Security Number.

Containing protected class variables Street Address, and Zip Code

Containing public Student ID number, Major.

The program should execute in way that student objects are created.

Then create a menu where the user can print sorted list of the student data available.

Use Comparator Interface to sort over different data fields.

Create private modifiers for sensitive materials.

Return redacted versions of social security, DOB.

For example – Social security = XXX-XX-8010

DOB – XX/XX/1980

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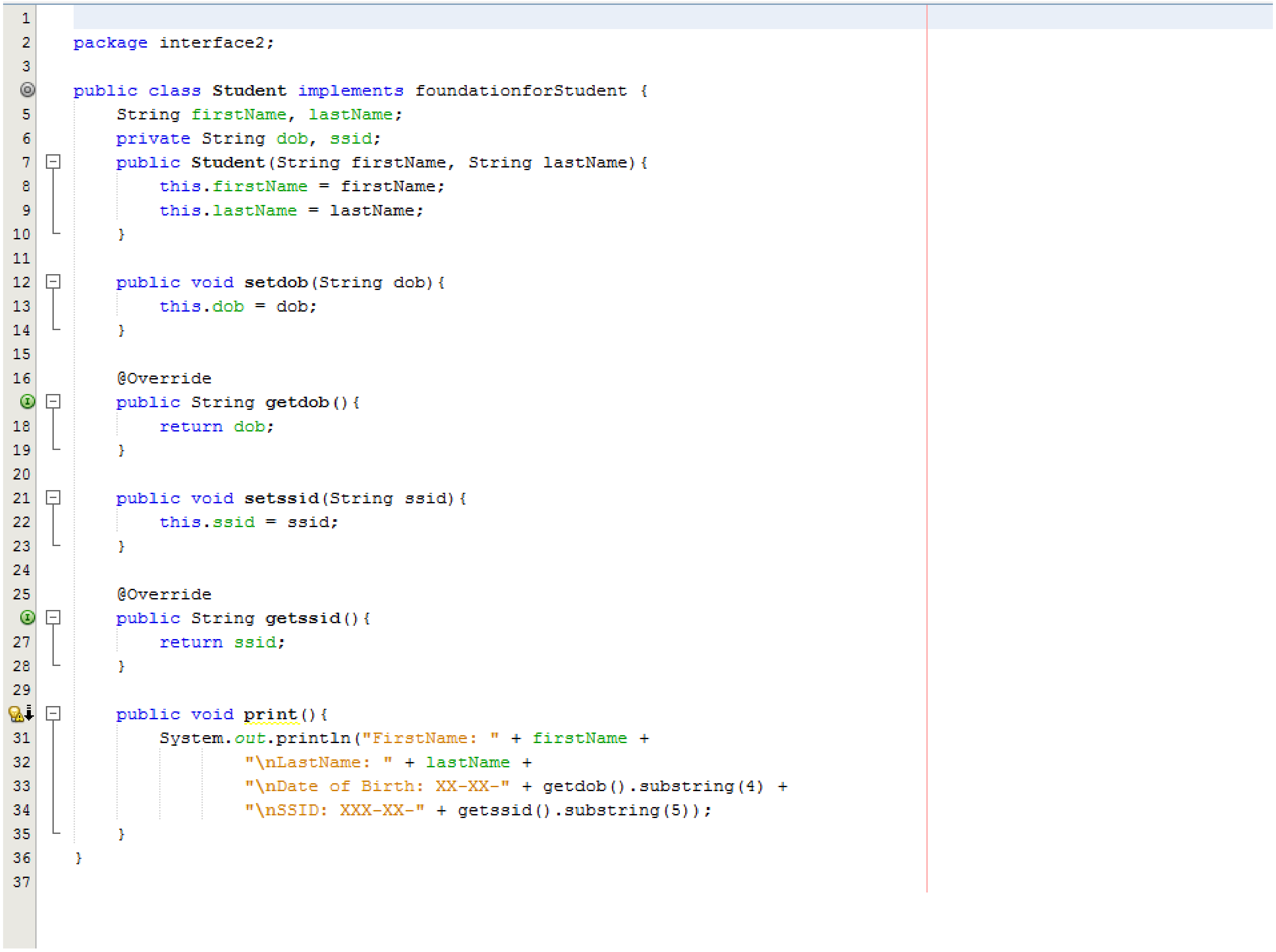
Student Name______________________________Student ID____________________________Point Total

Attach Snipping Photos Below

```
*************************************

* Main Menu:                                              *

*    Enter # to run program or Quit                       *

*    1) Print Sorted List of Student Names                *

*    2) Print Sorted List of Student Addresses            *

*    3) Print Soretd lsit of Student ID numbers           *

*    4) Quit                                              *

*************************************
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

Student Name________________________________ **Student ID**________________________________ **Point Total**



```java

package interface2;

public class Student implements foundationforStudent {
    String firstName, lastName;
    private String dob, ssid;
    public Student(String firstName, String lastName){
        this.firstName = firstName;
        this.lastName = lastName;
    }

    public void setdob(String dob){
        this.dob = dob;
    }

    @Override
    public String getdob(){
        return dob;
    }

    public void setssid(String ssid){
        this.ssid = ssid;
    }

    @Override
    public String getssid(){
        return ssid;
    }

    public void print(){
        System.out.println("FirstName: " + firstName +
                "\nLastName: " + lastName +
                "\nDate of Birth: XX-XX-" + getdob().substring(4) +
                "\nSSID: XXX-XX-" + getssid().substring(5));
    }
}
```

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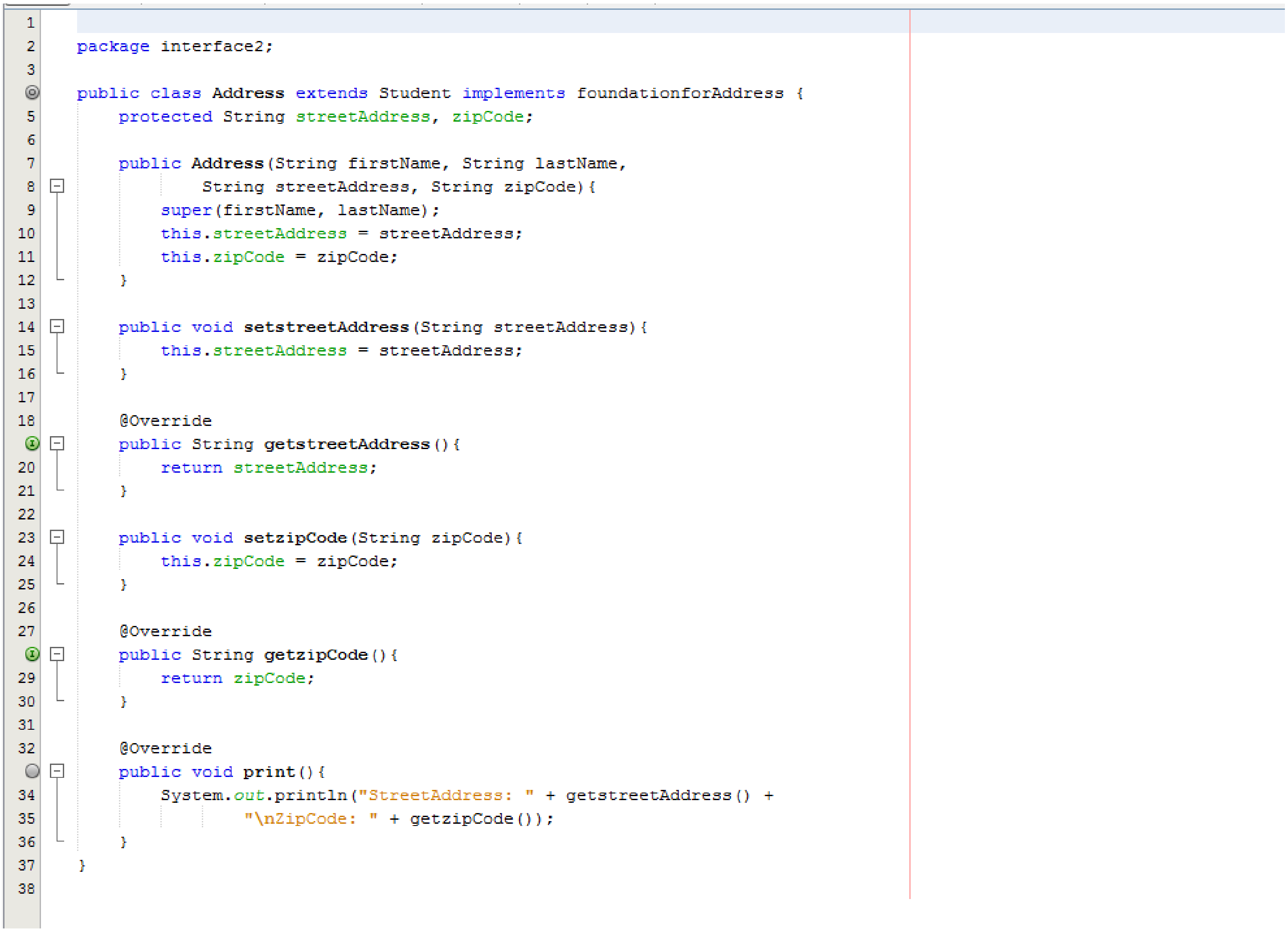
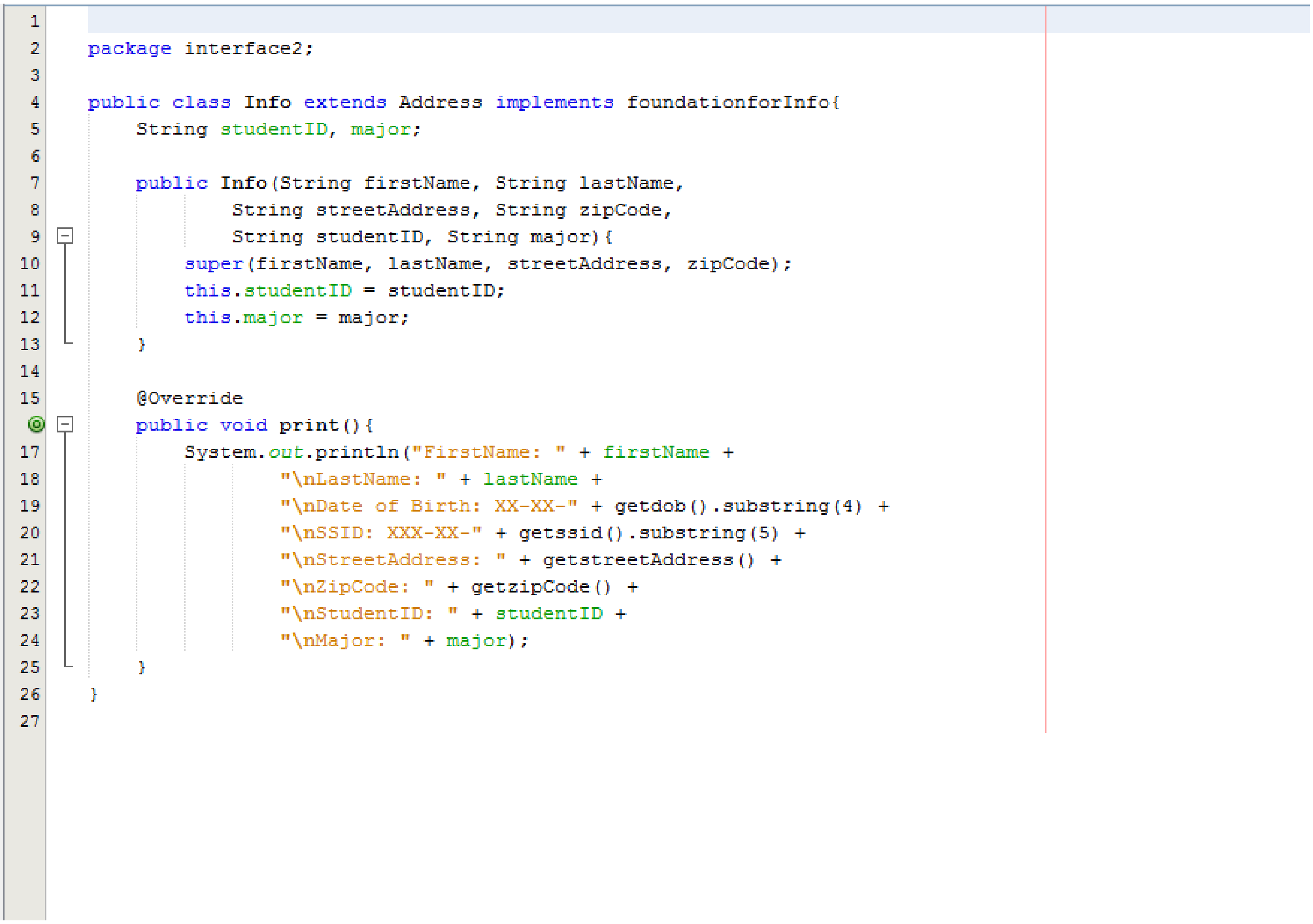


```java

package interface2;

public class Address extends Student implements foundationforAddress {
    protected String streetAddress, zipCode;

    public Address(String firstName, String lastName,
            String streetAddress, String zipCode){
        super(firstName, lastName);
        this.streetAddress = streetAddress;
        this.zipCode = zipCode;
    }

    public void setstreetAddress(String streetAddress){
        this.streetAddress = streetAddress;
    }

    @Override
    public String getstreetAddress(){
        return streetAddress;
    }

    public void setzipCode(String zipCode){
        this.zipCode = zipCode;
    }

    @Override
    public String getzipCode(){
        return zipCode;
    }

    @Override
    public void print(){
        System.out.println("StreetAddress: " + getstreetAddress() +
                "\nZipCode: " + getzipCode());
    }
}

```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

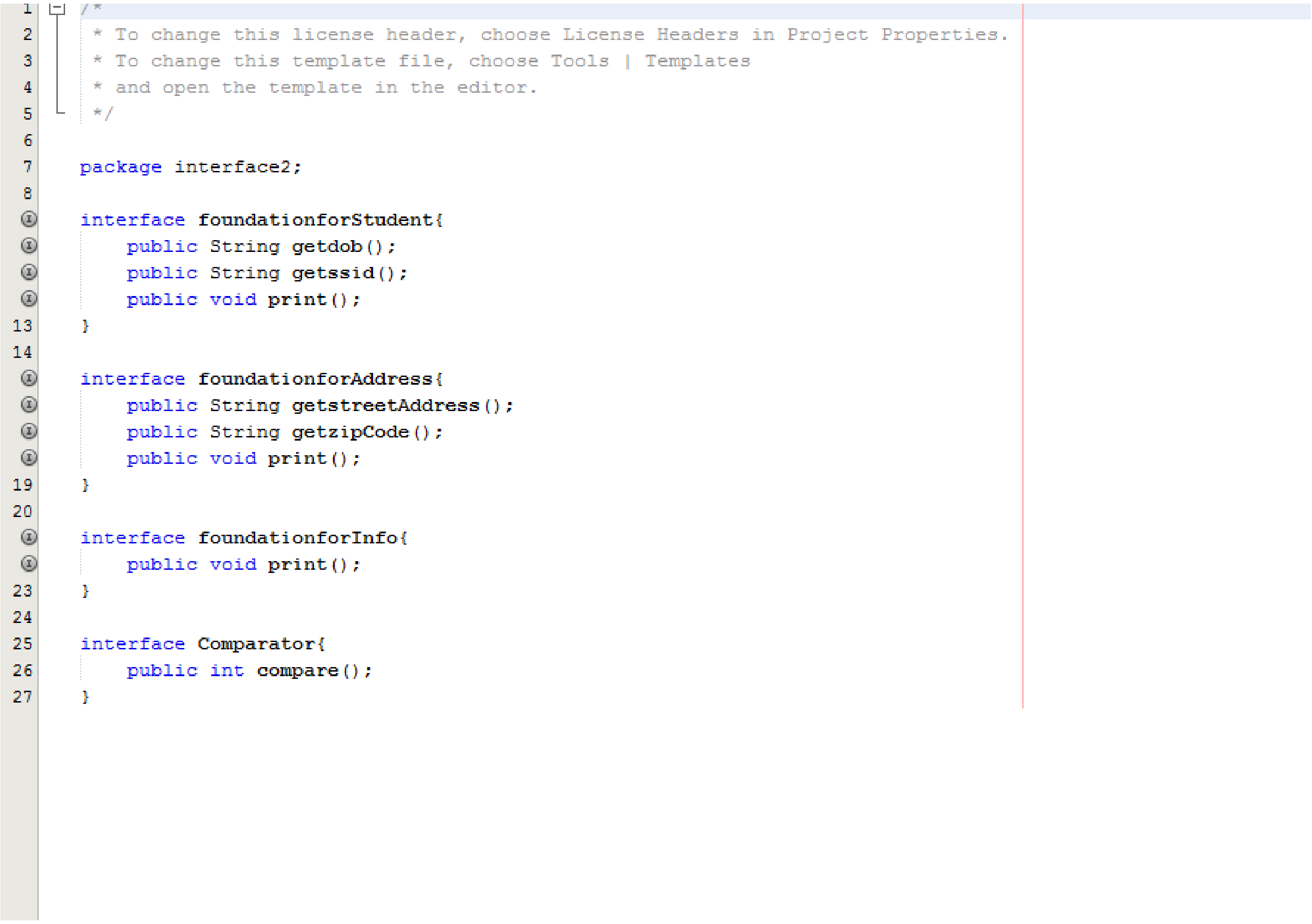
Student Name______________________________ **Student ID**______________________________ **Point Total**



```java

package interface2;

public class Info extends Address implements foundationforInfo{
    String studentID, major;

    public Info(String firstName, String lastName,
            String streetAddress, String zipCode,
            String studentID, String major){
        super(firstName, lastName, streetAddress, zipCode);
        this.studentID = studentID;
        this.major = major;
    }

    @Override
    public void print(){
        System.out.println("FirstName: " + firstName +
                "\nLastName: " + lastName +
                "\nDate of Birth: XX-XX-" + getdob().substring(4) +
                "\nSSID: XXX-XX-" + getssid().substring(5) +
                "\nStreetAddress: " + getstreetAddress() +
                "\nZipCode: " + getzipCode() +
                "\nStudentID: " + studentID +
                "\nMajor: " + major);
    }
}
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

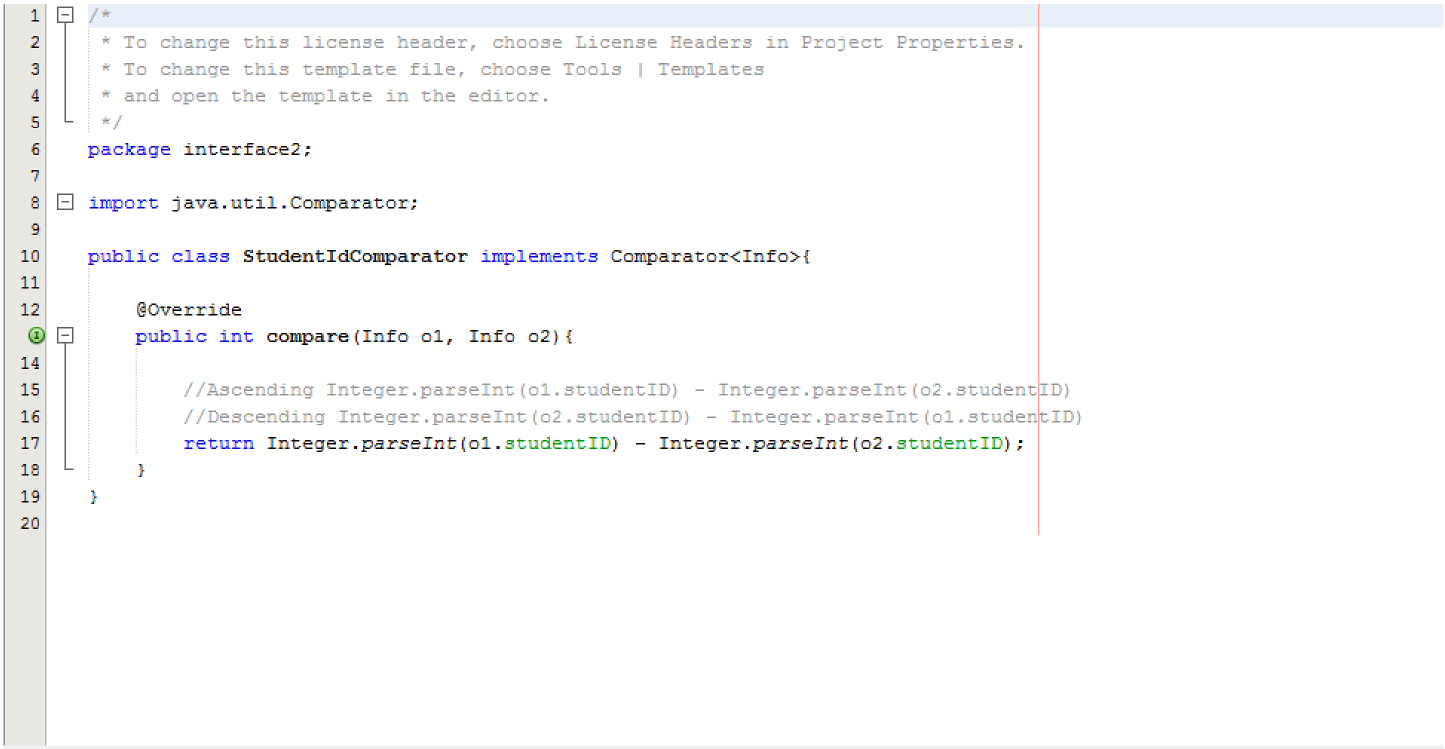
Student Name______________________________ **Student ID**______________________________ **Point Total**



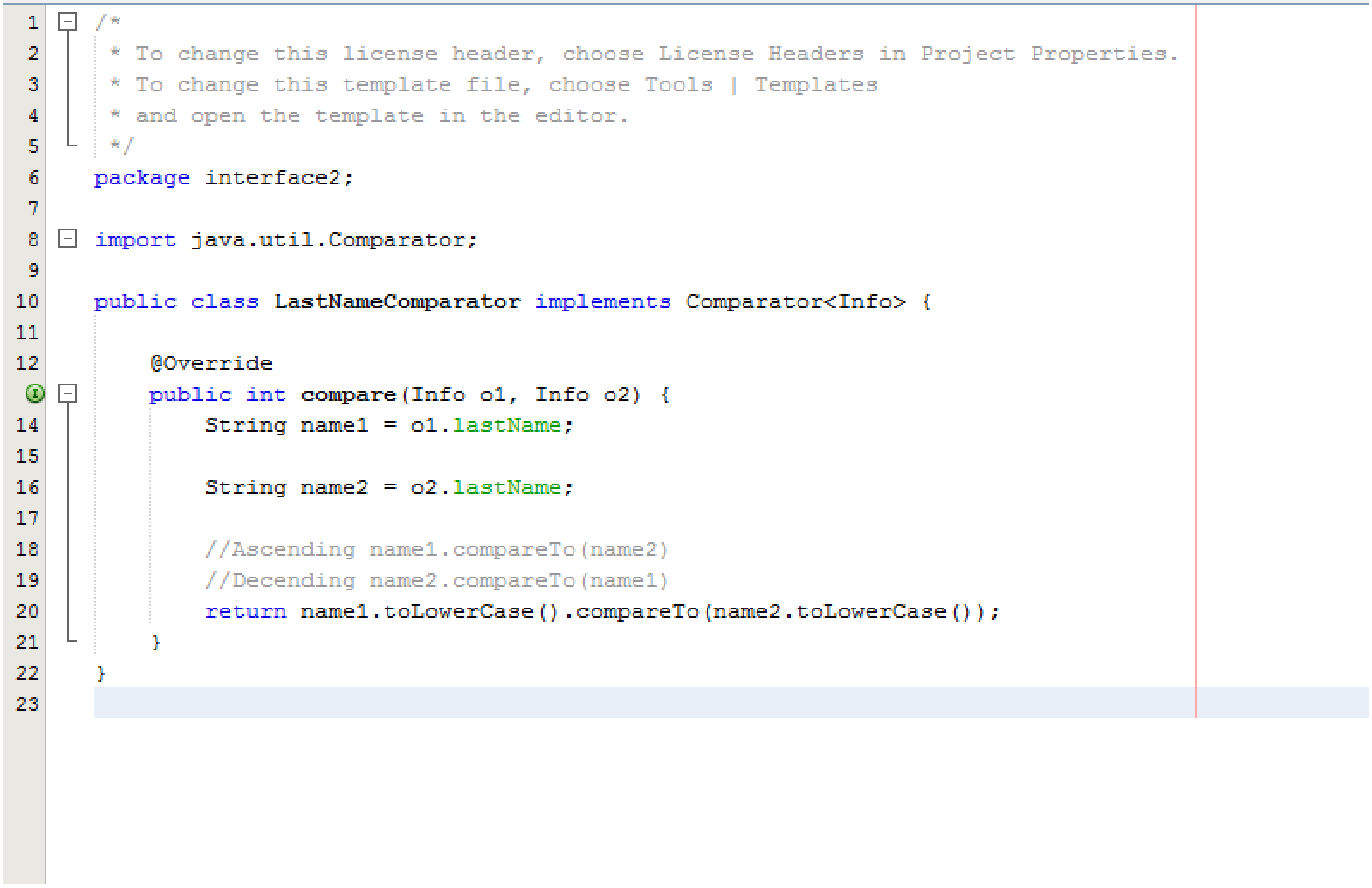
```java
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */

package interface2;

interface foundationforStudent{
    public String getdob();
    public String getssid();
    public void print();
}

interface foundationforAddress{
    public String getstreetAddress();
    public String getzipCode();
    public void print();
}

interface foundationforInfo{
    public void print();
}

interface Comparator{
    public int compare();
}
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

Student Name__________________________________ **Student ID**________________________________ **Point Total**



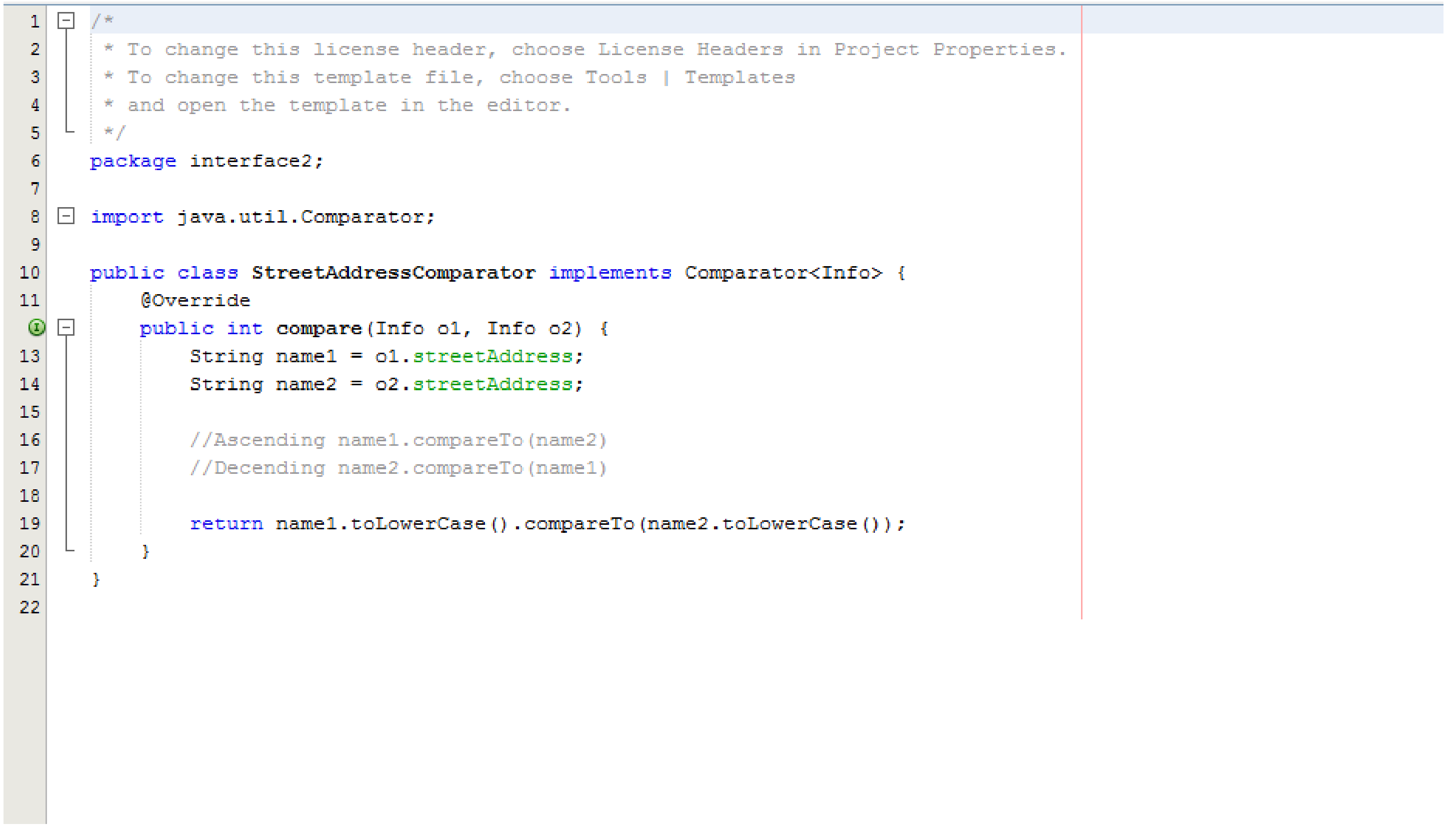
```java
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package interface2;

import java.util.Comparator;

public class StudentIdComparator implements Comparator<Info>{

    @Override
    public int compare(Info o1, Info o2){

        //Ascending Integer.parseInt(o1.studentID) - Integer.parseInt(o2.studentID)
        //Descending Integer.parseInt(o2.studentID) - Integer.parseInt(o1.studentID)
        return Integer.parseInt(o1.studentID) - Integer.parseInt(o2.studentID);
    }
}
```



```java
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package interface2;

import java.util.Comparator;

public class LastNameComparator implements Comparator<Info> {

    @Override
    public int compare(Info o1, Info o2) {
        String name1 = o1.lastName;

        String name2 = o2.lastName;

        //Ascending name1.compareTo(name2)
        //Decending name2.compareTo(name1)
        return name1.toLowerCase().compareTo(name2.toLowerCase());
    }
}
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

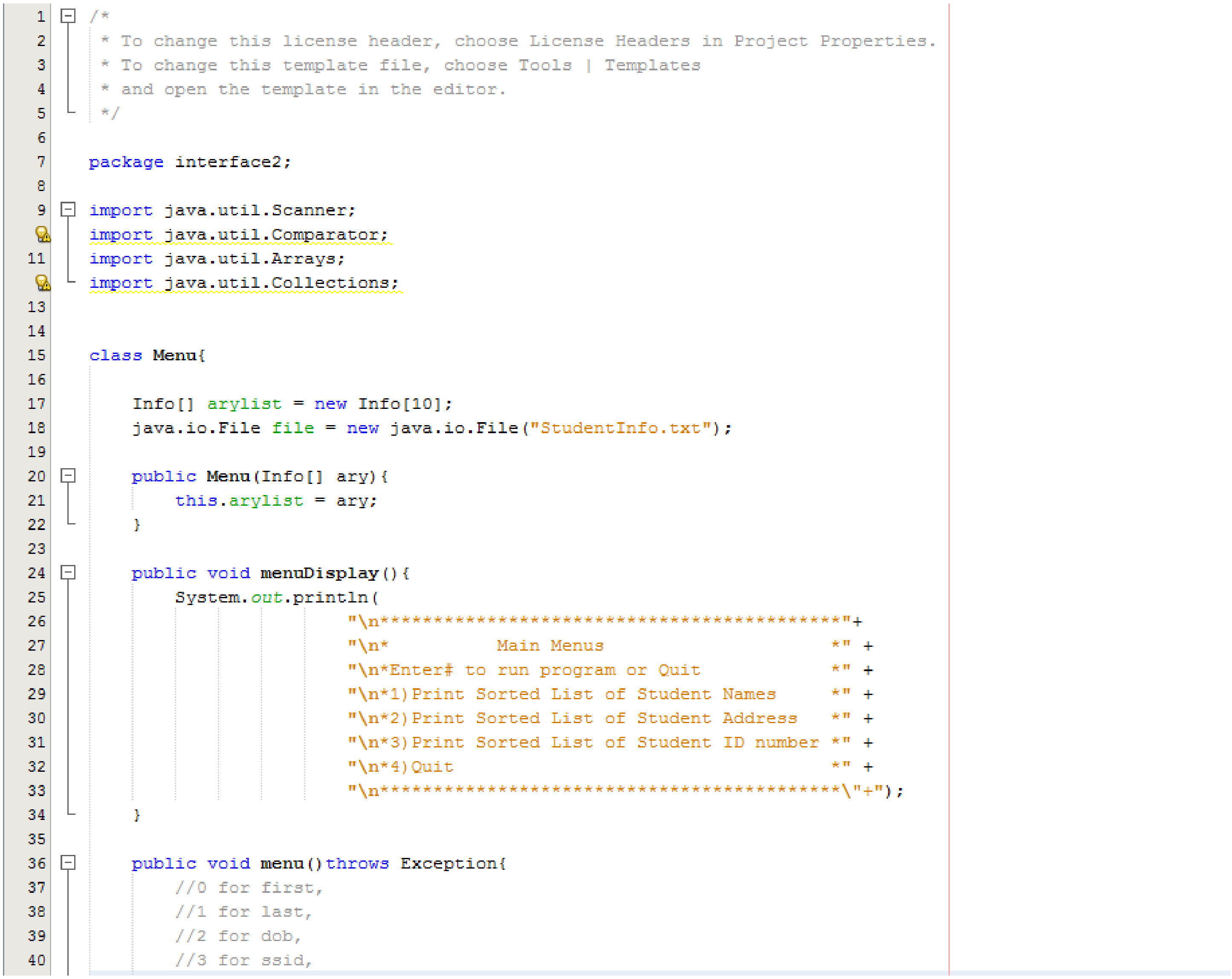
Student Name______________________________ **Student ID**______________________________ **Point Total**



```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package interface2;

import java.util.Comparator;

public class StreetAddressComparator implements Comparator<Info> {
    @Override
    public int compare(Info o1, Info o2) {
        String name1 = o1.streetAddress;
        String name2 = o2.streetAddress;

        //Ascending name1.compareTo(name2)
        //Decending name2.compareTo(name1)

        return name1.toLowerCase().compareTo(name2.toLowerCase());
    }
}
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

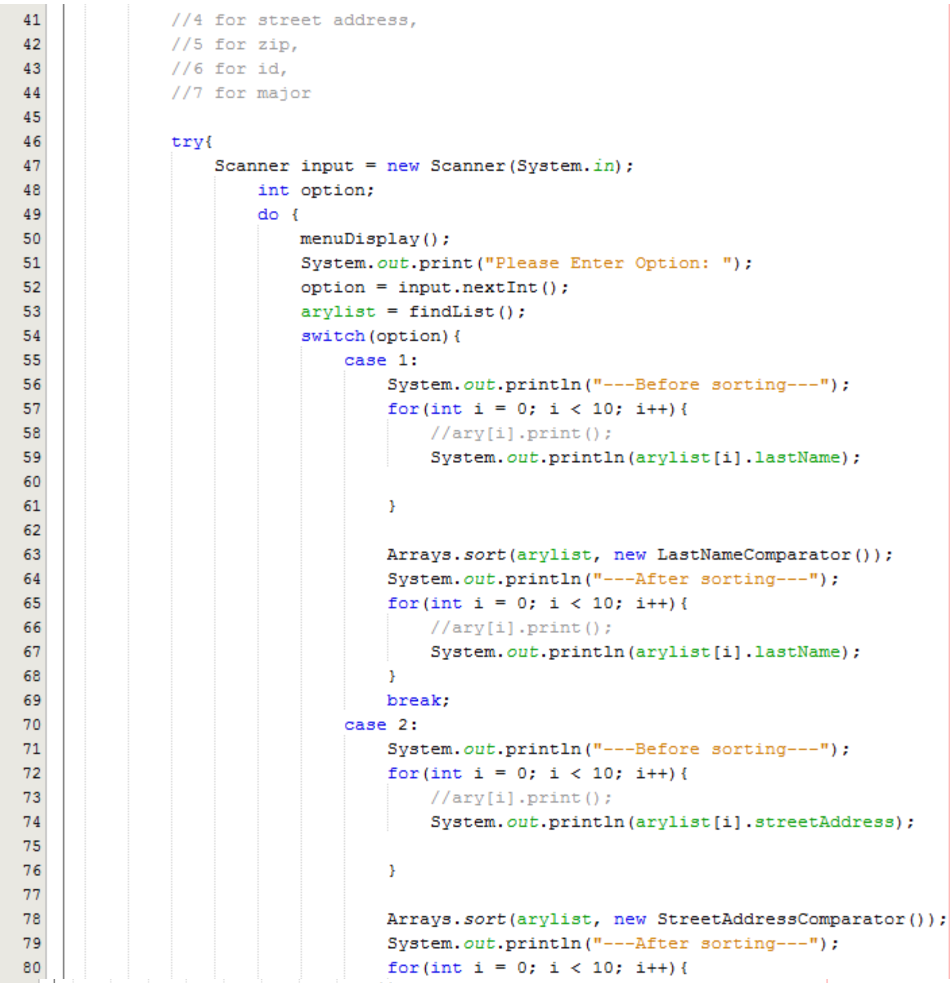
Student Name______________________________ **Student ID**______________________________ **Point Total**



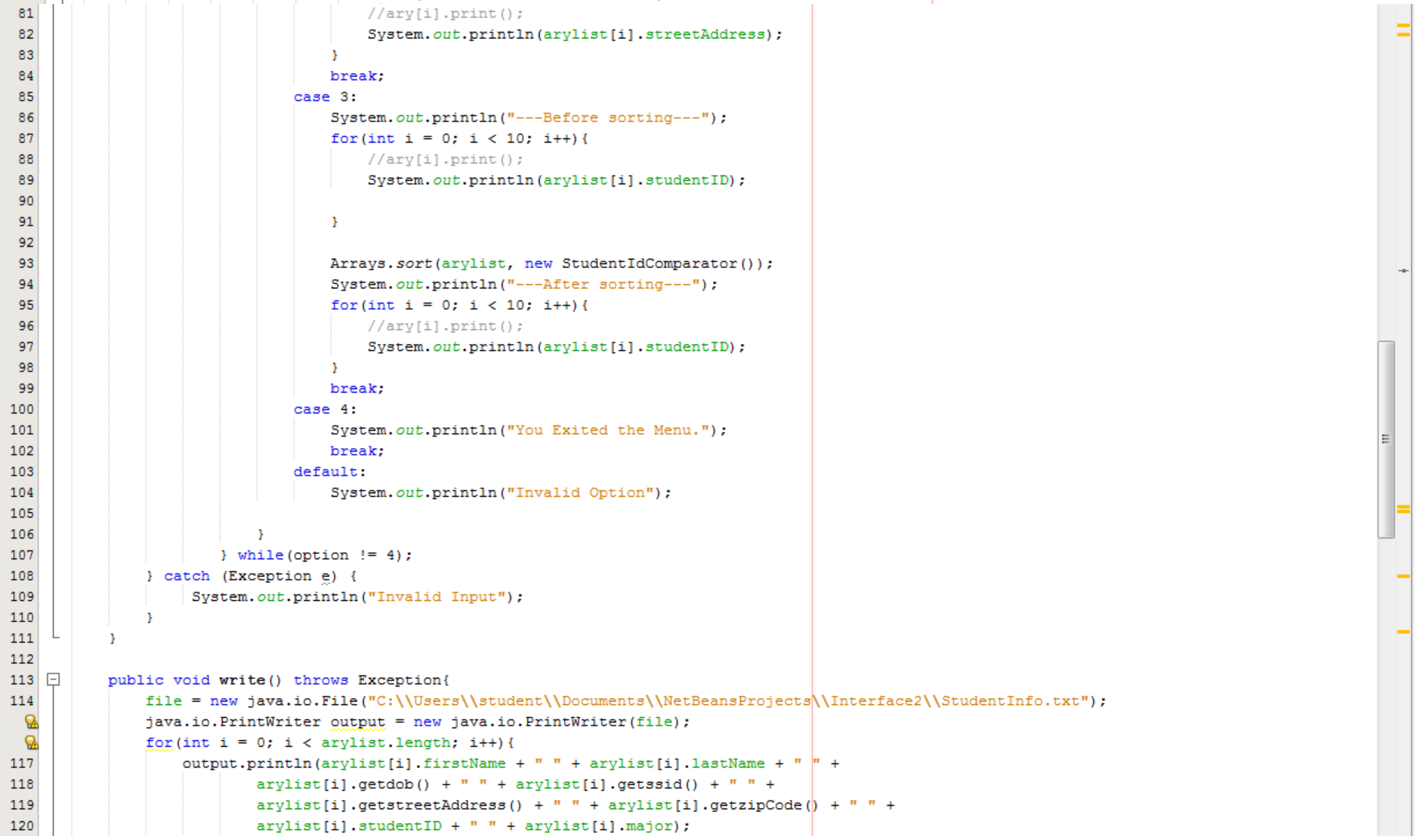
```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */

package interface2;

import java.util.Scanner;
import java.util.Comparator;
import java.util.Arrays;
import java.util.Collections;


class Menu{

    Info[] arylist = new Info[10];
    java.io.File file = new java.io.File("StudentInfo.txt");

    public Menu(Info[] ary){
        this.arylist = ary;
    }

    public void menuDisplay(){
        System.out.println(
                        "\n*******************************************"+
                        "\n*          Main Menus                     *" +
                        "\n*Enter# to run program or Quit            *" +
                        "\n*1)Print Sorted List of Student Names     *" +
                        "\n*2)Print Sorted List of Student Address   *" +
                        "\n*3)Print Sorted List of Student ID number *" +
                        "\n*4)Quit                                   *" +
                        "\n******************************************\"+");
    }

    public void menu()throws Exception{
        //0 for first,
        //1 for last,
        //2 for dob,
        //3 for ssid,
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

Student Name___________________________________ **Student ID**___________________________________ **Point Total**



```java
        //4 for street address,
        //5 for zip,
        //6 for id,
        //7 for major

        try{
            Scanner input = new Scanner(System.in);
                int option;
                do {
                    menuDisplay();
                    System.out.print("Please Enter Option: ");
                    option = input.nextInt();
                    arylist = findList();
                    switch(option){
                        case 1:
                            System.out.println("---Before sorting---");
                            for(int i = 0; i < 10; i++){
                                //ary[i].print();
                                System.out.println(arylist[i].lastName);

                            }

                            Arrays.sort(arylist, new LastNameComparator());
                            System.out.println("---After sorting---");
                            for(int i = 0; i < 10; i++){
                                //ary[i].print();
                                System.out.println(arylist[i].lastName);
                            }
                            break;
                        case 2:
                            System.out.println("---Before sorting---");
                            for(int i = 0; i < 10; i++){
                                //ary[i].print();
                                System.out.println(arylist[i].streetAddress);

                            }

                            Arrays.sort(arylist, new StreetAddressComparator());
                            System.out.println("---After sorting---");
                            for(int i = 0; i < 10; i++){
```



```java
                                //ary[i].print();
                                System.out.println(arylist[i].streetAddress);
                            }
                            break;
                        case 3:
                            System.out.println("---Before sorting---");
                            for(int i = 0; i < 10; i++){
                                //ary[i].print();
                                System.out.println(arylist[i].studentID);

                            }

                            Arrays.sort(arylist, new StudentIdComparator());
                            System.out.println("---After sorting---");
                            for(int i = 0; i < 10; i++){
                                //ary[i].print();
                                System.out.println(arylist[i].studentID);
                            }
                            break;
                        case 4:
                            System.out.println("You Exited the Menu.");
                            break;
                        default:
                            System.out.println("Invalid Option");

                    }
                } while(option != 4);
        } catch (Exception e) {
            System.out.println("Invalid Input");
        }
    }

    public void write() throws Exception{
        file = new java.io.File("C:\\Users\\student\\Documents\\NetBeansProjects\\Interface2\\StudentInfo.txt");
        java.io.PrintWriter output = new java.io.PrintWriter(file);
        for(int i = 0; i < arylist.length; i++){
            output.println(arylist[i].firstName + " " + arylist[i].lastName + " " +
                    arylist[i].getdob() + " " + arylist[i].getssid() + " " +
                    arylist[i].getstreetAddress() + " " + arylist[i].getzipCode() + " " +
                    arylist[i].studentID + " " + arylist[i].major);
```

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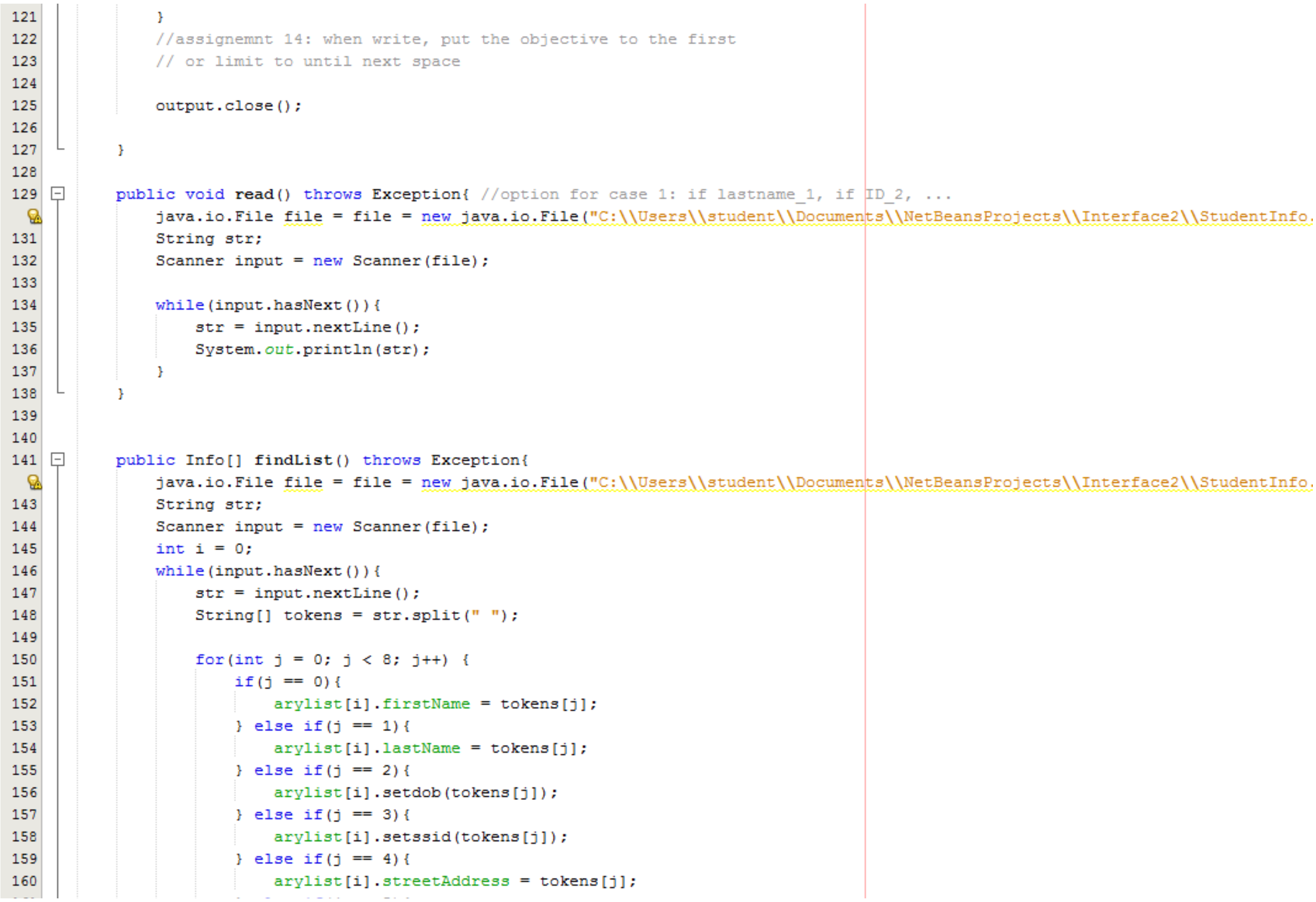
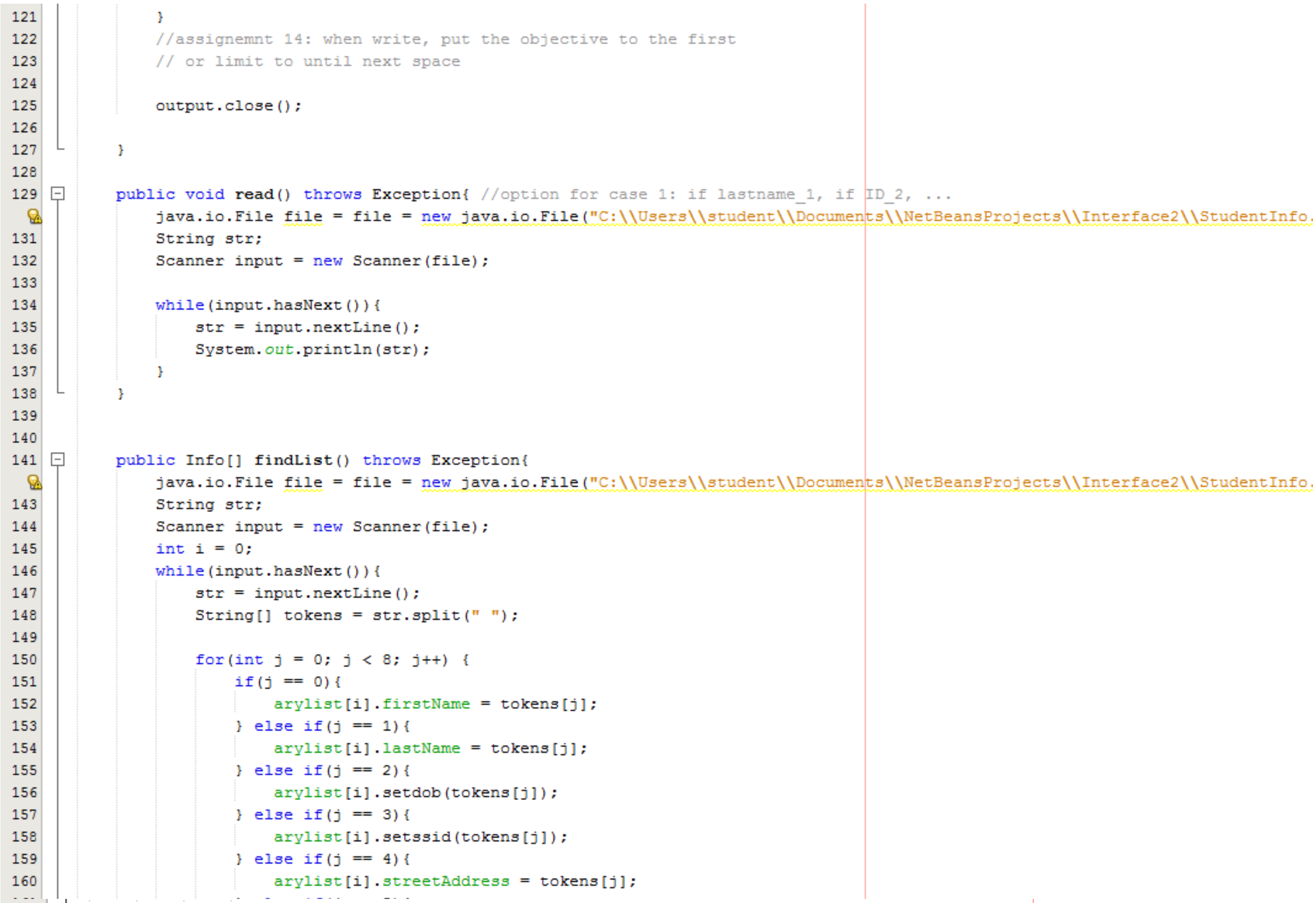


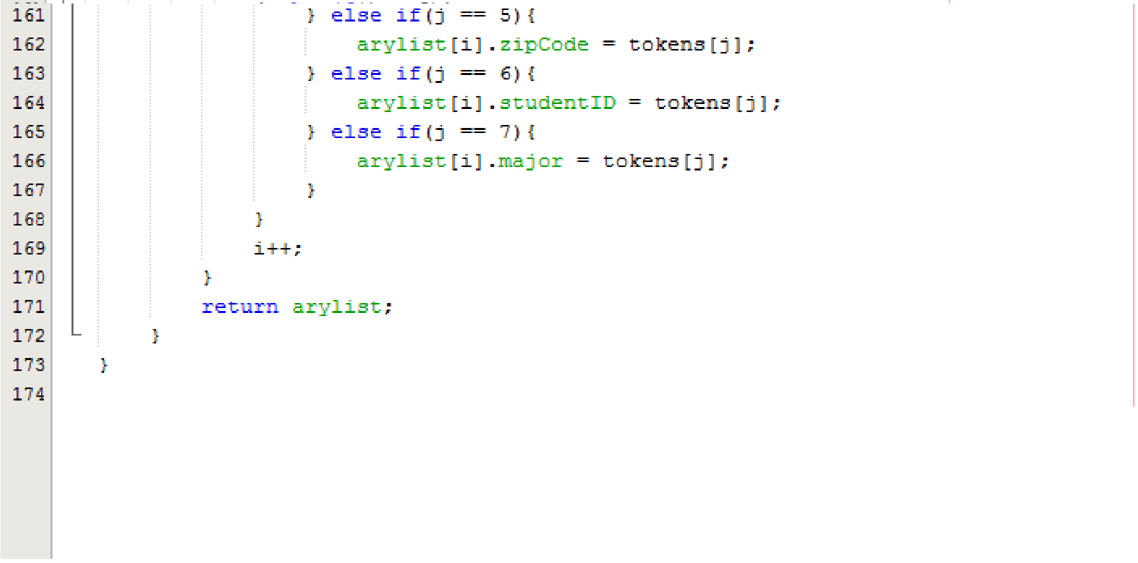
```
        }
        //assignemnt 14: when write, put the objective to the first
        // or limit to until next space

        output.close();

    }

    public void read() throws Exception{ //option for case 1: if lastname_1, if ID_2, ...
        java.io.File file = file = new java.io.File("C:\\Users\\student\\Documents\\NetBeansProjects\\Interface2\\StudentInfo.
        String str;
        Scanner input = new Scanner(file);

        while(input.hasNext()){
            str = input.nextLine();
            System.out.println(str);
        }
    }


    public Info[] findList() throws Exception{
        java.io.File file = file = new java.io.File("C:\\Users\\student\\Documents\\NetBeansProjects\\Interface2\\StudentInfo.
        String str;
        Scanner input = new Scanner(file);
        int i = 0;
        while(input.hasNext()){
            str = input.nextLine();
            String[] tokens = str.split(" ");

            for(int j = 0; j < 8; j++) {
                if(j == 0){
                    arylist[i].firstName = tokens[j];
                } else if(j == 1){
                    arylist[i].lastName = tokens[j];
                } else if(j == 2){
                    arylist[i].setdob(tokens[j]);
                } else if(j == 3){
                    arylist[i].setssid(tokens[j]);
                } else if(j == 4){
                    arylist[i].streetAddress = tokens[j];
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

Student Name______________________________ **Student ID**______________________________ **Point Total**



```
        }
        //assignemnt 14: when write, put the objective to the first
        // or limit to until next space

        output.close();

    }

    public void read() throws Exception{ //option for case 1: if lastname_1, if ID_2, ...
        java.io.File file = file = new java.io.File("C:\\Users\\student\\Documents\\NetBeansProjects\\Interface2\\StudentInfo.
        String str;
        Scanner input = new Scanner(file);

        while(input.hasNext()){
            str = input.nextLine();
            System.out.println(str);
        }
    }


    public Info[] findList() throws Exception{
        java.io.File file = file = new java.io.File("C:\\Users\\student\\Documents\\NetBeansProjects\\Interface2\\StudentInfo.
        String str;
        Scanner input = new Scanner(file);
        int i = 0;
        while(input.hasNext()){
            str = input.nextLine();
            String[] tokens = str.split(" ");

            for(int j = 0; j < 8; j++) {
                if(j == 0){
                    arylist[i].firstName = tokens[j];
                } else if(j == 1){
                    arylist[i].lastName = tokens[j];
                } else if(j == 2){
                    arylist[i].setdob(tokens[j]);
                } else if(j == 3){
                    arylist[i].setssid(tokens[j]);
                } else if(j == 4){
                    arylist[i].streetAddress = tokens[j];
```



```
                } else if(j == 5){
                    arylist[i].zipCode = tokens[j];
                } else if(j == 6){
                    arylist[i].studentID = tokens[j];
                } else if(j == 7){
                    arylist[i].major = tokens[j];
                }
            }
            i++;
        }
        return arylist;
    }
}
```

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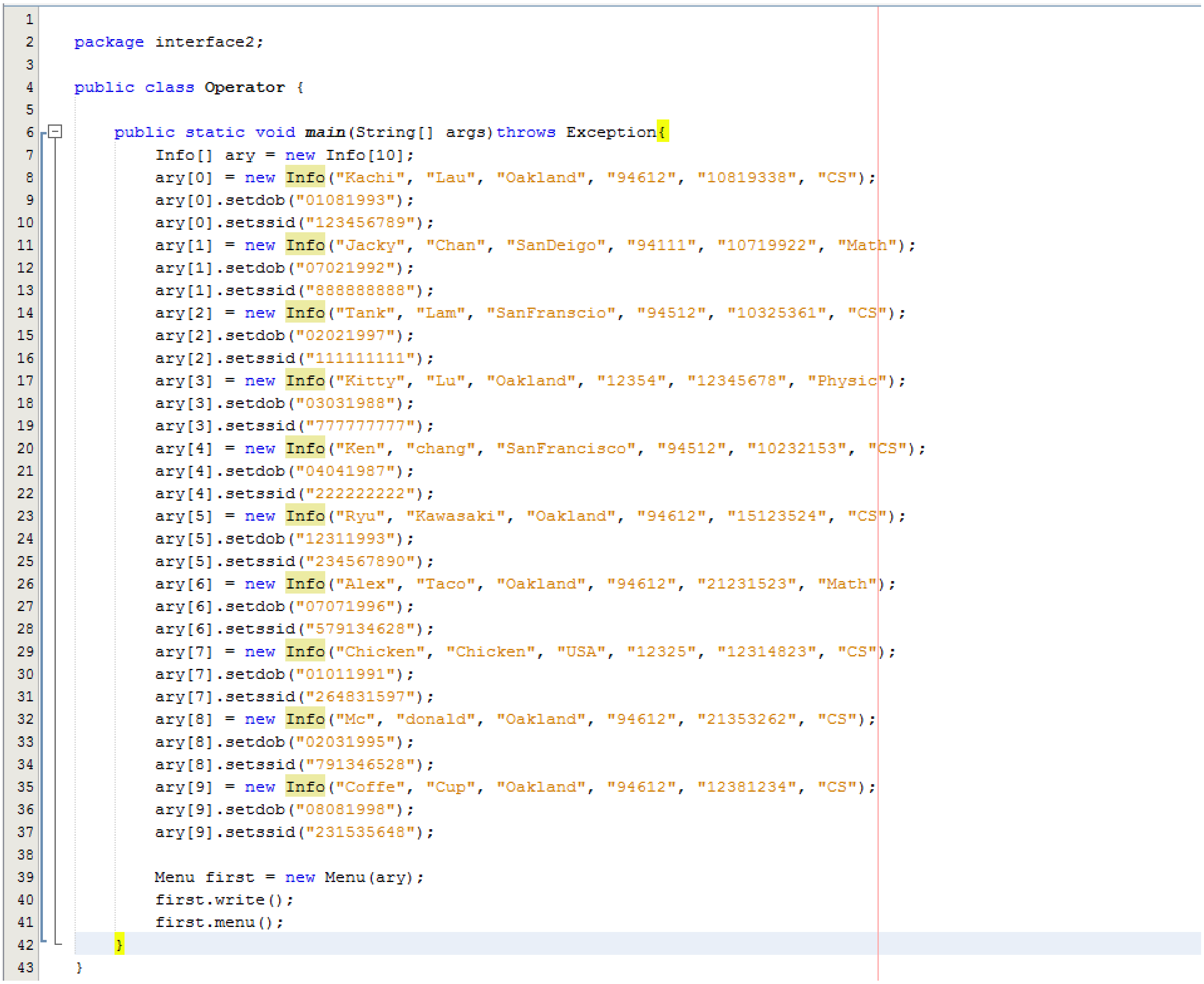
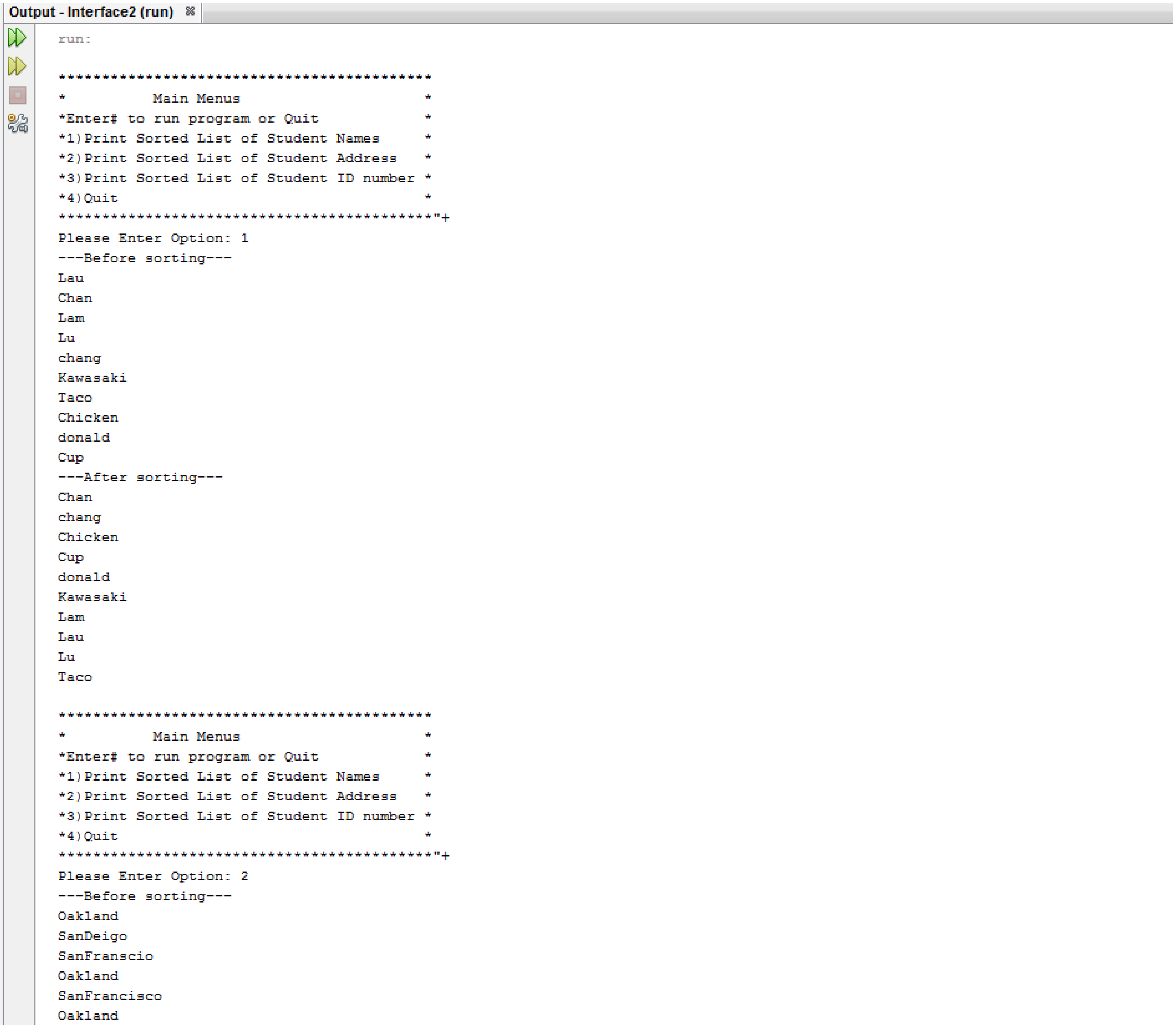


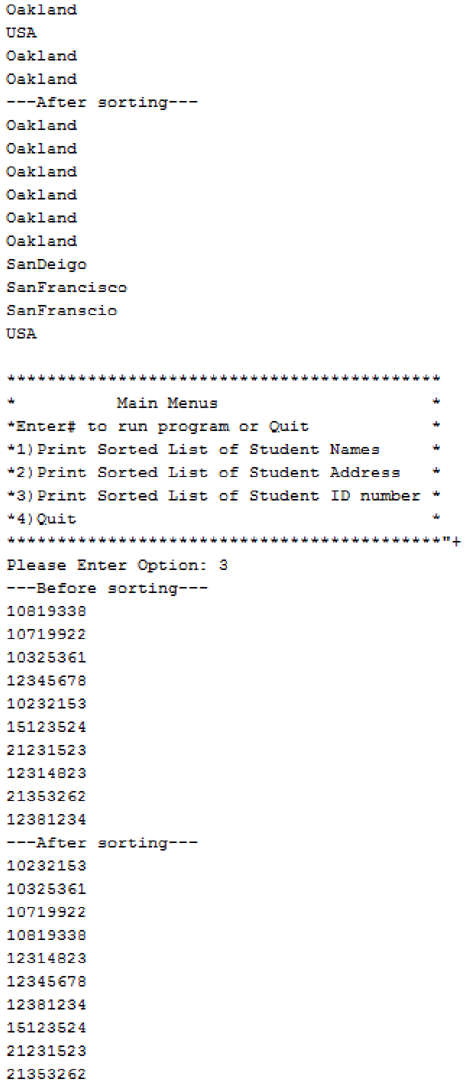
```java

package interface2;

public class Operator {

    public static void main(String[] args)throws Exception{
        Info[] ary = new Info[10];
        ary[0] = new Info("Kachi", "Lau", "Oakland", "94612", "10819338", "CS");
        ary[0].setdob("01081993");
        ary[0].setssid("123456789");
        ary[1] = new Info("Jacky", "Chan", "SanDeigo", "94111", "10719922", "Math");
        ary[1].setdob("07021992");
        ary[1].setssid("888888888");
        ary[2] = new Info("Tank", "Lam", "SanFranscio", "94512", "10325361", "CS");
        ary[2].setdob("02021997");
        ary[2].setssid("111111111");
        ary[3] = new Info("Kitty", "Lu", "Oakland", "12354", "12345678", "Physic");
        ary[3].setdob("03031988");
        ary[3].setssid("777777777");
        ary[4] = new Info("Ken", "chang", "SanFrancisco", "94512", "10232153", "CS");
        ary[4].setdob("04041987");
        ary[4].setssid("222222222");
        ary[5] = new Info("Ryu", "Kawasaki", "Oakland", "94612", "15123524", "CS");
        ary[5].setdob("12311993");
        ary[5].setssid("234567890");
        ary[6] = new Info("Alex", "Taco", "Oakland", "94612", "21231523", "Math");
        ary[6].setdob("07071996");
        ary[6].setssid("579134628");
        ary[7] = new Info("Chicken", "Chicken", "USA", "12325", "12314823", "CS");
        ary[7].setdob("01011991");
        ary[7].setssid("264831597");
        ary[8] = new Info("Mc", "donald", "Oakland", "94612", "21353262", "CS");
        ary[8].setdob("02031995");
        ary[8].setssid("791346528");
        ary[9] = new Info("Coffe", "Cup", "Oakland", "94612", "12381234", "CS");
        ary[9].setdob("08081998");
        ary[9].setssid("231535648");

        Menu first = new Menu(ary);
        first.write();
        first.menu();
    }
}
```

CIS 36B – 14th Class / Lab Assignment – **10 Points-**

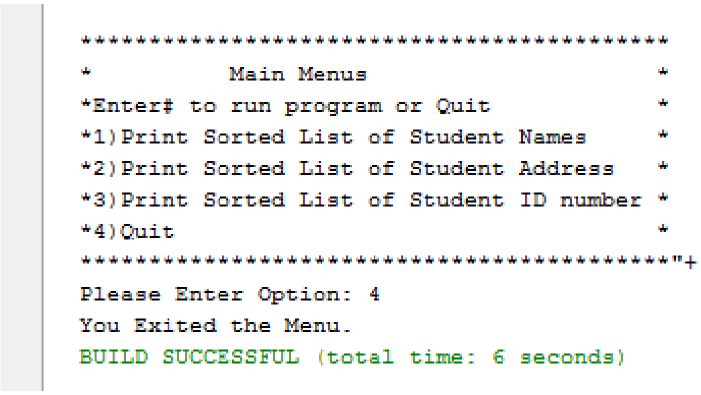
Student Name____________________________________ **Student ID**____________________________________ **Point Total**



```
run:

*******************************************
*          Main Menus                     *
*Enter# to run program or Quit            *
*1)Print Sorted List of Student Names     *
*2)Print Sorted List of Student Address   *
*3)Print Sorted List of Student ID number *
*4)Quit                                   *
*******************************************"+
Please Enter Option: 1
---Before sorting---
Lau
Chan
Lam
Lu
chang
Kawasaki
Taco
Chicken
donald
Cup
---After sorting---
Chan
chang
Chicken
Cup
donald
Kawasaki
Lam
Lau
Lu
Taco

*******************************************
*          Main Menus                     *
*Enter# to run program or Quit            *
*1)Print Sorted List of Student Names     *
*2)Print Sorted List of Student Address   *
*3)Print Sorted List of Student ID number *
*4)Quit                                   *
*******************************************"+
Please Enter Option: 2
---Before sorting---
Oakland
SanDeigo
SanFranscio
Oakland
SanFrancisco
Oakland
```



```
Oakland
USA
Oakland
Oakland
---After sorting---
Oakland
Oakland
Oakland
Oakland
Oakland
Oakland
SanDeigo
SanFrancisco
SanFranscio
USA

*******************************************
*          Main Menus                     *
*Enter# to run program or Quit            *
*1)Print Sorted List of Student Names     *
*2)Print Sorted List of Student Address   *
*3)Print Sorted List of Student ID number *
*4)Quit                                   *
*******************************************"+
Please Enter Option: 3
---Before sorting---
10819338
10719922
10325361
12345678
10232153
15123524
21231523
12314823
21353262
12381234
---After sorting---
10232153
10325361
10719922
10819338
12314823
12345678
12381234
15123524
21231523
21353262
```



```
*******************************************
*          Main Menus                     *
*Enter# to run program or Quit            *
*1)Print Sorted List of Student Names     *
*2)Print Sorted List of Student Address   *
*3)Print Sorted List of Student ID number *
*4)Quit                                   *
*******************************************"+
Please Enter Option: 4
You Exited the Menu.
BUILD SUCCESSFUL (total time: 6 seconds)
```