CIS 36B – 13th Class / Lab Assignment – **10 Points-**

Student Name _____ **Student ID** _____ **Point Total**

Pg. 306, Java Programming *A comprehensive Introduction*

Section 1: Define / Answer

interface-

1. A **Java interface** is a bit like a class, except a **Java interface** can only contain method signatures and fields. An **Java interface** cannot contain an implementation of the methods, only the signature (name, parameters and exceptions) of the method. You can use **interfaces** in**Java** as a way to achieve polymorphism.

implements-

`implements` is for *implementing* an interface

The difference between an interface and a regular class is that in an interface you can not implement any of the declared methods. Only the class that "implements" the interface can implement the methods. The C++ equivalent of an interface would be an abstract class (not EXACTLY the same but pretty much).

To declare a class that implements an interface, you include an `implements` clause in the class declaration. Your class can implement more than one interface, so the `implements`keyword is followed by a comma-separated list of the interfaces implemented by the class. By convention, the `implements` clause follows the `extends` clause, if there is one.

abstract method-

An *abstract class* is a class that is declared `abstract`—it may or may not include abstract methods. Abstract classes cannot be instantiated, but they can be subclassed.

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Task 1:

USE OBJECT ORIENTATED PROGRAM DESIGN TO SOLVE PROBLEM

Update Assignment #12, Task 1.

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

Place all student information into a Text File.

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 Parent SuperClass Student. Containing First Name, Last Name, private DOB, Social Security Number.

Create a subclass containing protected class variables Street Address, and Zip Code

Create a subclass containing public Student ID number, Major.

Create a menu giving the user the ability to search student LastName.

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If the student is in the text file print students First Name, Last Name, and Student ID number.

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

Create private modifiers for sensitive materials.

Attach Snipping Photos Below

****

*** Main Menu: ***

*** Enter # to run program or Quit ***

*** 1) Search Student Last Name ***

*** 4) Quit ***

****

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```
1
2   package interface1;
3
4   public class Student implements foundationforStudent {
5       String firstName, lastName;
6       private String dob, ssid;
7       public Student(String firstName, String lastName){
8           this.firstName = firstName;
9           this.lastName = lastName;
10      }
11
12      public void setdob(String dob){
13          this.dob = dob;
14      }
15
16      @Override
17      public String getdob(){
18          return dob;
19      }
20
21      public void setssid(String ssid){
22          this.ssid = ssid;
23      }
24
25      @Override
26      public String getssid(){
27          return ssid;
28      }
29
30      public void print(){
31          System.out.println("FirstName: " + firstName +
32                  "\nLastName: " + lastName +
33                  "\nDate of Birth: XX-XX-" + getdob().substring(4) +
34                  "\nSSID: XXX-XX-" + getssid().substring(5));
35      }
36  }
37
```

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```
1
2   package interface1;
3
4   public class Address extends Student implements foundationforAddress {
5       protected String streetAddress, zipCode;
6
7       public Address(String firstName, String lastName,
8               String streetAddress, String zipCode){
9           super(firstName, lastName);
10          this.streetAddress = streetAddress;
11          this.zipCode = zipCode;
12      }
13
14      public void setstreetAddress(String streetAddress){
15          this.streetAddress = streetAddress;
16      }
17
18      @Override
19      public String getstreetAddress(){
20          return streetAddress;
21      }
22
23      public void setzipCode(String zipCode){
24          this.zipCode = zipCode;
25      }
26
27      @Override
28      public String getzipCode(){
29          return zipCode;
30      }
31
32      @Override
33      public void print(){
34          System.out.println("StreetAddress: " + getstreetAddress() +
35                  "\nZipCode: " + getzipCode());
36      }
37  }
38
```

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```
1
2   package interface1;
3
4   public class Info extends Address implements foundationforInfo{
5       String studentID, major;
6
7       public Info(String firstName, String lastName,
8               String streetAddress, String zipCode,
9               String studentID, String major){
10          super(firstName, lastName, streetAddress, zipCode);
11          this.studentID = studentID;
12          this.major = major;
13      }
14
15      @Override
16      public void print(){
17          System.out.println("FirstName: " + firstName +
18                  "\nLastName: " + lastName +
19                  "\nDate of Birth: XX-XX-" + getdob().substring(4) +
20                  "\nSSID: XXX-XX-" + getssid().substring(5) +
21                  "\nStreetAddress: " + getstreetAddress() +
22                  "\nZipCode: " + getzipCode() +
23                  "\nStudentID: " + studentID +
24                  "\nMajor: " + major);
25      }
26  }
27
```

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```
1  /*
2   * To change this license header, choose License Headers in Project Properti
3   * To change this template file, choose Tools | Templates
4   * and open the template in the editor.
5   */
6
7  package interface1;
8
   interface foundationforStudent{
       public String getdob();
       public String getssid();
       public void print();
13 }
14
   interface foundationforAddress{
       public String getstreetAddress();
       public String getzipCode();
       public void print();
19 }
20
   interface foundationforInfo{
       public void print();
23 }
```

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```
1
2   package interface1;
3
4   import java.util.Scanner;
5
6   class Work{
7
8       Info[] ary;
9       java.io.File file = new java.io.File("StudentInfo.txt");
10
11      public Work(Info[] ary){
12          this.ary = ary;
13      }
14
15      public void menuDisplay(){
16          System.out.println(
17                          "\n*************************************"+
18                          "\n*          Main Menus                 *" +
19                          "\n*Enter# to run program or Quit      *" +
20                          "\n*1)Search Student Last Name         *" +
21                          "\n*2)Quit                             *" +
22                          "\n*************************************\"+");
23      }
24
25      public void menu(Info[] ary){
26          try{
27              Scanner input = new Scanner(System.in);
28                  int option;
29                  String lastName;
30                  do {
31                      menuDisplay();
32                      System.out.print("Please Enter Option: ");
33                      option = input.nextInt();
34                      switch(option){
35                          case 1:
36                              System.out.print("Please enter Student LastName: ");
37                              lastName = input.next();
38                              search(1, lastName); //0 for first, 1 for last, 2 for dob, 3 for ssid, 4 for street address, 5 for zip, 6 for id, 7 for major
39                              break;
40                          case 2:
41                              System.out.println("You Exited the Menu.");
42                              break;
43                          default:
44                              System.out.println("Invalid Option");
45
46                      }
47                  } while(option != 2);
48          } catch (Exception e) {
49              System.out.println("Invalid Input");
50          }
51      }
52
53      public void write() throws Exception{
54          file = new java.io.File("C:\\Users\\student\\Documents\\NetBeansProjects\\Interface1\\StudentInfo.txt");
            java.io.PrintWriter output = new java.io.PrintWriter(file);
            for(int i = 0; i < ary.length; i++){
57              output.println(ary[i].firstName + " " + ary[i].lastName + " " +
58                      ary[i].getdob() + " " + ary[i].getssid() + " " +
59                      ary[i].getstreetAddress() + " " + ary[i].getzipCode() + " " +
60                      ary[i].studentID + " " + ary[i].major);
```

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```
61          }
62          //assignemnt 14: when write, put the objective to the first
63          // or limit to until next space
64
65          output.close();
66
67      }
68
69      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\\Interface1\\StudentInfo.txt");
71          String str;
72          Scanner input = new Scanner(file);
73
74          while(input.hasNext()){
75              str = input.nextLine();
76              System.out.println(str);
77          }
78      }
79
80      public void search(int x, String lastName) 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\\Interface1\\StudentInfo.txt");
82          String str;
83          String temp = lastName;
84          temp = Character.toLowerCase(temp.charAt(0)) + temp.substring(1);
85          int ok = 0;
86          Scanner input = new Scanner(file);
87          int i = 0;
88          while(input.hasNext()){
89              str = input.nextLine();
90              String[] tokens = str.split(" ");
91              if(tokens[x].equals(lastName) || tokens[x].equals(temp)){
92                  ok = 1;
93                  print(i);
94              }
95              i++;
96          }
97
98          if(ok == 0){
99              System.out.println("The LastName that you entered is not exist in our database.");
100         }
101     }
102
103     public void print(int i){
104         System.out.println("FirstName: " + ary[i].firstName +
105                 "\nLastName: " + ary[i].lastName +
106                 "\nDate of Birth: XX-XX-" + ary[i].getdob().substring(4) +
107                 "\nSSID: XXX-XX-" + ary[i].getssid().substring(5) +
108                 "\nStreetAddress: " + ary[i].getstreetAddress() +
109                 "\nZipCode: " + ary[i].getzipCode() +
110                 "\nStudentID: " + ary[i].studentID +
111                 "\nMajor: " + ary[i].major);
112     }
113
114
115 }
116
117 public class Operator {
118
119     public static void main(String[] args)throws Exception{
120         Info[] ary = new Info[10];
```

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```
121             ary[0] = new Info("Kachi", "Lau", "Oakland", "94612", "10819338", "CS");
122             ary[0].setdob("01081993");
123             ary[0].setssid("123456789");
124             ary[1] = new Info("Jacky", "Chan", "SanDeigo", "94111", "10719922", "Math");
125             ary[1].setdob("07021992");
126             ary[1].setssid("888888888");
127             ary[2] = new Info("Tank", "Lam", "SanFranscio", "94512", "10325361", "CS");
128             ary[2].setdob("02021997");
129             ary[2].setssid("111111111");
130             ary[3] = new Info("Kitty", "Lu", "Oakland", "12354", "12345678", "Physic");
131             ary[3].setdob("03031988");
132             ary[3].setssid("777777777");
133             ary[4] = new Info("Ken", "chang", "SanFrancisco", "94512", "10232153", "CS");
134             ary[4].setdob("04041987");
135             ary[4].setssid("222222222");
136             ary[5] = new Info("Ryu", "Kawasaki", "Oakland", "94612", "15123524", "CS");
137             ary[5].setdob("12311993");
138             ary[5].setssid("234567890");
139             ary[6] = new Info("Alex", "Taco", "Oakland", "94612", "21231523", "Math");
140             ary[6].setdob("07071996");
141             ary[6].setssid("579134628");
142             ary[7] = new Info("Chicken", "Chicken", "USA", "12325", "12314823", "CS");
143             ary[7].setdob("01011991");
144             ary[7].setssid("264831597");
145             ary[8] = new Info("Mc", "donald", "Oakland", "94612", "21353262", "CS");
146             ary[8].setdob("02031995");
147             ary[8].setssid("791346528");
148             ary[9] = new Info("FirstName", "LastName", "Oakland", "94612", "12381234", "CS");
149             ary[9].setdob("08081998");
150             ary[9].setssid("231535648");
151
152                Work first = new Work(ary);
153                first.write();
154                first.menu(ary);
155         }
156     }
157
```

Operator

Output - Interface1 (run)

```
run:

************************************
*          Main Menus              *
*Enter# to run program or Quit     *
*1)Search Student Last Name        *
*2)Quit                           *
************************************"+
Please Enter Option: 1
Please enter Student LastName: Taco
FirstName: Alex
LastName: Taco
Date of Birth: XX-XX-1996
SSID: XXX-XX-4628
StreetAddress: Oakland
ZipCode: 94612
StudentID: 21231523
Major: Math

************************************
*          Main Menus              *
*Enter# to run program or Quit     *
*1)Search Student Last Name        *
*2)Quit                           *
************************************"+
Please Enter Option: 2
You Exited the Menu.
BUILD SUCCESSFUL (total time: 11 seconds)
```