

UECS2344 Software Design: Practical 3

The following application is used to manage a registry of students. It consists of the following:

- Student *class* that represents a student
- IStudentRegistry *interface* which contains the methods for managing registry of students
- RegistryArrayList *class* which *implements* the IStudentRegistry interface and manages a list of students in an ArrayList
- RegistryApp *class* which contains the main() method – all input and output is handled in this class

Take note that the classes and interface are organized into two **packages**:

- *registry.app* package
- *registry.domain* package.

Also the classes in *registry.domain* package are **imported** for use in *RegistryApp* class.

(a) Run the application to see how it works.

(b) Draw the following diagrams for the application:

(i) Class Diagram

(ii) Sequence Diagram

// in file Student.java

package registry.domain; // registry.domain package

```
public class Student {  
    private String name;  
    private int id;  
  
    public Student(String name, int id) {  
        this.name = name;  
        this.id = id;  
    }  
  
    public String getName() {  
        return name;  
    }  
  
    public int getId() {  
        return id;  
    }  
}
```

// in file IStudentRegistry.java

```

package registry.domain;    // registry.domain package

import java.util.List;

public interface IStudentRegistry {

    public void addStudent(String name, int id);

    public Student searchStudent(String name);

    public int getNumberOfStudents();

    public List<Student> getStudents();

}

```

// in file StudentRegistryList.java

```

package registry.domain;    // registry.domain package

import java.util.List;
import java.util.ArrayList;

public class StudentRegistryList implements IStudentRegistry {

    private List<Student> students;

    public StudentRegistryList() {
        students = new ArrayList<Student>();
    }

    public void addStudent(String name, int id) {
        Student aStudent = new Student(name, id);
        students.add(aStudent);
    }

    public Student searchStudent(String name) {
        boolean found = false;
        int i = 0;
        int count = students.size();

        Student theStudent= null;
        while (i<count && !found) {
            theStudent = students.get(i);
            if (theStudent.getName().equals(name))
                found = true;
            else
                i++;
        }

        if (!found)
            theStudent = null;
    }
}

```

```

        return theStudent;
    }

    public int getNumberOfStudents() {
        return students.size();
    }

    public List<Student> getStudents() {
        return students;
    }
}

```

// in file RegistryApp.java

```

package registry.app;           // registry.app package

import java.util.List;
import java.util.Scanner;

import registry.domain.*;       // import classes from registry.domain

public class RegistryApp {

    private static IStudentRegistry studentList;

    private static Scanner scanner;

    public static void main(String[] args) {

        studentList = new StudentRegistryList();
        scanner = new Scanner(System.in);

        int choice;

        do {
            System.out.println("Do you want to:");
            System.out.println("1. Register new student");
            System.out.println("2. Search for student");
            System.out.println("3. View all students");
            System.out.println("4. Exit");

            System.out.print("Enter your choice (1-4): ");
            choice = scanner.nextInt();
            // read the enter key after integer input
            String skip = scanner.nextLine();

            while (choice < 1 || choice > 4) {
                System.out.println("Invalid choice.");
                System.out.print("Enter your choice (1-4): ");
                choice = scanner.nextInt();
                // read the enter key after integer input
            }
        }
    }
}

```

```

        skip = scanner.nextLine();
    }

    switch(choice) {
        case 1: addStudent(); break;
        case 2: viewASStudent(); break;
        case 3: viewALLStudents(); break;
    }
    System.out.println();
} while (choice != 4);
}

public static void addStudent() {
    System.out.print("Enter student name: ");
    String theName = scanner.nextLine();
    System.out.print("Enter student id: ");
    int theId = scanner.nextInt();
    // read the enter key after integer input
    String skip = scanner.nextLine();

    studentList.addStudent(theName, theId);
    System.out.println("Student added");
    System.out.println();
}

public static void viewASStudent() {
    System.out.print("Enter name of student: ");
    String theName = scanner.nextLine();

    Student theStudent = studentList.searchStudent(theName);

    if (theStudent == null)
        System.out.println("No student with that name found");
    else
        System.out.println("Name: " + theStudent.getName()
            + "\tId: " + theStudent.getId());
    System.out.println();
}

public static void viewAllStudents() {
    List<Student> theStudents = studentList.getStudents();

    for (int i=0; i< theStudents.size(); i++) {
        Student aStudent = theStudents.get(i);

        System.out.println("Name: " + aStudent.getName()
            + "\tId: " + aStudent.getId());
    }
}
}

```