CS0048 DATA STRUCTURES AND FILES

Assignment 1 – Reading From Files and using ArrayList

Preparation (the whole project should be done in Netbeans or other IDE)

1. In Netbeans, create a new project **Assign1** with GroupID **CS0048Spring2022** so that you get a package called **cs0048spring2022.assign1**
2. Add two classes to the **Assign1** project as described below – put the command

   package cs0048spring2022.assign1;

   at the top of each of them. To set the class that contains the **`main`** go to File-Project Propertes-Run.
3. Download the file **StudentData.txt** from Canvas and put it in the Assign1 folder.

Program

Write a class called **`Student`** with 4 **`private`** instance variables – first name, last name, age and gpa. Write 2 constructors, 4 get methods, 4 set methods and a **`toString`** method.

Write a class, **`StudentListDriver`** with a **`main`** to do the following:

- read all the data from the **StudentList.txt** text file and put it into an **`ArrayList<Student>`** structure **which must be a static class member**. Use a **`Scanner`** to read from the file using methods like **`next()`**, **`nextInt()`**, **`nextDouble()`**
- Print the number of students in the **`ArrayList`**
- Print the student at index 100 in the **`ArrayList`**.
- Print and remove the student at index 57 in the **`ArrayList`**.
- Print how many students have a GPA between 3 and 4 inclusive.
- Print the **student names only** of those students whose GPA is between 2.5 and 3 inclusive.
- Delete the first student record with the name "Todd Novak"
- Print the student data from index 100 to the end.

5 of the parts above should be done by writing and then calling **`static`** methods:

`readData` – for first part above

`countBetween(lowerGpa, upperGpa)` – return the number of students in the **`ArrayList`** with a GPA between **`lowerGpa`** and **`upperGpa`** inclusive. Use an **`Iterator`**

`printNamesBetween(lowerGpa, upperGPA)` – print names of students in the **`ArrayList`** with a GPA between **`lowerGpa`** and **`upperGpa`** inclusive. Use an **`Iterator`**.

`deleteName(studentName)` – delete the first occurrence of **`studentName`** in the **`ArrayList`**. Use an **`Iterator.`**

`printStudent(lowerIndex, upperIndex)` – print students in the **`ArrayList`** between the indexes **`lowerIndex`** and **`upperIndex`** inclusive. Do not use an **`Iterator`**.

Other Notes

1. An **`ArrayList`** has similar indexing to an array – it starts at 0 and ends at size - 1.
2. Set up the **`Scanner`** using the command

```
Scanner fileInput = new Scanner(new File("StudentData.txt"));
```

3. Close the Scanner using the **`close()`** method.
4. When setting up the **`Scanner`**, you will have to handle **`FileNotFoundException`** which is a checked exception. You can have the program quit (with an error message) if the exception occurs.
5. You can set up the **`iterator`** by using the **`iterator`** method from the **`ArrayList`** class.
6. You will need to read the Java API information for the **`Iterator<T>`** interface and **`ArrayList<T>`** class.

Turning in the Assignment

Take a screenshot of your program running. Zip up the whole project from the base folder and submit the zipped file and the screenshot. Due by the start of the next class on January 20.