

Pre-Lab 3 Exercise

CS 106: Introduction to Data Structures

Week 4

Note: this should be completed before starting Lab 2. You should begin this exercise *before* lab on Friday Feb 14 – it is okay to complete it during lab (you should be checked off by the end of lab).

Goals:

- Get practice with creating classes, objects and reading in CSV data.

PRE-LAB

This in-lab is a continuation from Pre-Lab 2 (with the StudentProfile.csv file). You should have at least gotten started on the String[] constructor last week. Please complete the constructor (and any other parts of that in-lab).

CREATING A DATA CLASS

We can think of the entire data as a collection of all of the rows. We can compile all the rows into a collection with a built-in object, ArrayList. When we read in the data, it will come in as an ArrayList of String arrays. We will then convert it row by row into the data type you defined in Pre-Lab 2 (I will refer to this as **Student**, but you might have called it something else).

1. Create a class that holds the entire dataset (not just one row) of the CSV.
2. Make a variable of type ArrayList that holds the rows of objects (each of type **Student**).
3. Create a constructor whose input is an ArrayList of String arrays. This constructor should then use a for loop (you may use a foreach loop) to convert each String array into a **Student**. At the end of the constructor, you should have fully initialized the ArrayList.
4. Create a toString method for this new class. It should also use a for loop and call the toString method for each **Student**, and build up the return value using StringBuilder. You can use “\n” to create a line break, so that each student will appear on one line.

READING IN THE DATA

We will be using the Opencsv library to help us read in the csv file. As mentioned above, the data read in will be of type ArrayList<String[]>.

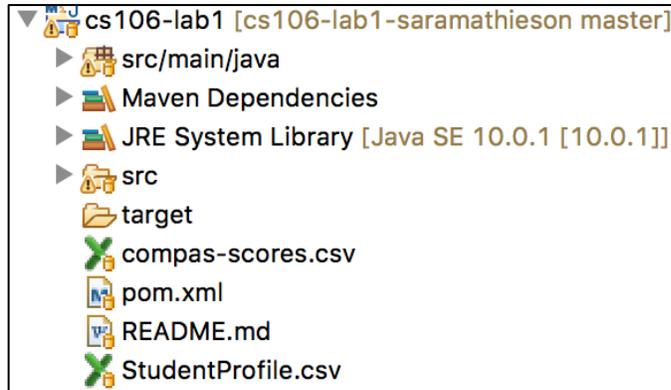
For example, the read-in data will exist like this (only the first two rows from the csv are shown):

```
ArrayList<String[]> dataReadIn =  
    < {"Will", "20", "Sophomore", "Barclay", "Yes", "Michael Elias"},  
    {"Steve", "19", "First Year", "Barclay", "No", "Katrina Glanzer"} ,  
    ... >;
```

Before reading in the data, we need to add the StudentProfile.csv file to your Eclipse project. After downloading this file (which should go to Downloads), open the Terminal and type (replacing my github username with your own):

```
cp ~/Downloads/StudentProfile.csv ~/git/cs106-lab1-saramathieson/
```

Then go back to Eclipse and right click on the project, then choose “Refresh”. You should now see the StudentProfile.csv as shown below: Now you should be ready to read in the csv data!



1. Create a Main class (the driver class) with the main method (**public static void** main(String args[])).
2. Inside the main method, put in the following:

```
CSVReaderHeaderAware dataReadIn =  
    new CSVReaderHeaderAware(new  
    FileReader("StudentProfile.csv"));  
ArrayList<String[]> myEntries =  
    new ArrayList<String[]>(dataReadIn.readAll());  
dataReadIn.close();
```

3. Correct any errors by adding any imports needed. Eclipse should help you with it. You can use a try/catch block to deal with exceptions related to reading in the file.
4. Now you should be able to use your constructor, passing in the myEntries variable. Then you should be able to use System.out.println(<instance of your object>) to see the entire list of **Students!**