

Spring 2022: CS 203 - Object-Oriented Programming

Lab 8

Objectives:

- Arrays & ArrayLists in Java

The objective of this lab is to learn how to use Java Object arrays. You need to complete the code of Student class in Student.java file and complete the following tasks:

1. Create `Student.java` with private variables, a constructor, and getters/setters. Variables may include name, an array or ArrayList of exam grades, a final grade, and a letter grade
2. In `Student.java`, define a method `setFinalGrade()` that should calculate and set the final grade of the student:

final grade = 25% of Exam 1, 25% of Exam 2, 50% of Final Exam

3. Define another method `setLetterGrade()` that calculates the letter grade of the students and updates the corresponding attribute (letterGrade).

A: finalGrade >= 90

B: 90 > finalGrade >= 80

C: 80 > finalGrade >= 70

F: 70 > finalGrade

4. Create a `StudentTester.java` file. Initialize an ArrayList storing Students. Within this file, read our `studentList.txt` file and create one Student object in each line. Each line consists of name, exam1, exam2, finalExam values and these values are comma separated. Store each student in the ArrayList (if you use array, you can initialize it to size 25)

studentList.txt

```
1 Benjamin James Adams,55,78,92
2 Michelle Salgado,90,88,94
3 Phillip M. Scott,50,98,96
4 Hayden Joel Smitt,82,44,66
5 Erica Rose White,66,56,100
6 Joel Timothy Dickens,86,35,100
7 Robert K. Garcia,88,92,95
8 Hannah Lucky,82,77,66
```

6. Once the Student objects are in the array, loop through the list. For each student in your array, set the letter grade and print each student's name and letter grade (do not hardcode each of the names and grades, use a loop to compute/print this information for each student)

The output can look something like this:

```
Benjamin James Adams received a grade of 79.25: C  
Michelle Salgado received a grade of 91.5: A  
Phillip M. Scott received a grade of 85.0: B  
Hayden Joel Smitt received a grade of 64.5: F  
Erica Rose White received a grade of 80.5: B  
Joel Timothy Dickens received a grade of 80.25: B  
Robert K. Garcia received a grade of 92.5: A  
Hannah Lucky received a grade of 72.75: C
```

Bonus Point: If you write this output into a studentGrades.txt file, you'll get 20 bonus points!

Grade: Complete the Student.java file = 25 points

Read from file = 25 points

Store the values in array = 25 points

Compute and display the results = 25 points

Write the result into a txt file = +20 points

Good Luck!