

CS 141 – Introduction to Programming and Problem Solving, HW3

In this two part homework (HW2 and HW3), you will implement a simple Gradebook for a course. The Gradebook will consist, basically, of an ArrayList of Students and an ArrayList of Grades of a particular student. Each student will be an instance of the Student class. You will also need to write the Grade class. There is also a data file provided [cs141grades.csv](#) to be used with this assignment. Of course, the grades and IDs are made up (don't take anything personally); you can even change your own grades as you see fit!

In this HW3, you will build upon the code from HW2. If you don't have a reasonably complete code from HW2, use the HW2 solution provided at the Piazza forum.

The Grade Class

In addition to the constructor, and getter/setters, provide a toString() method for the Grade class to print the name and the grade.

The Student Class

In addition to the constructor, and getter/setters, provide the following list of data field and methods for the Student class.

- private ArrayList to hold the Grade objects.
- Getter method to obtain the ArrayList
- addGrade(Grade grade) method to add a Grade object to the ArrayList of Grade objects. Your method should check whether the ArrayList is null (if so, create a new ArrayList) before adding Grade objects.
- toString() method for the Student class to print the name, the ID and the ArrayList data fields.

The GradeBook Class

In addition to the constructor (which takes .csv file path) and necessary methods to read the file data, you will need to write the following data fields and methods in the GradeBook class.

- private ArrayList to hold the Student objects.
- addStudent(Student student) method to add a Student object to the ArrayList of Student objects. Your method should check whether the ArrayList is null (if so, create a new ArrayList) before add Student objects.
- removeStudent(int id) method to remove a student from the GradeBook if exist. You should display appropriate messages if the student doesn't exist in the GradeBook.
- toString() method for the GradeBook class to display the entire GradeBook of students. You should call appropriate Student and Grade toString() methods to display the content.

Of course, you will also need to test your methods by creating an object of GradeBook from main by passing the csv file as an argument to the GradeBook constructor. Check all the functionality of your methods before submitting your assignment.

Submission: To be submitted as **FirstnameLastname-141-A3.zip** file on Blackboard (under Assignments)

- Grade.java
- GradeBook.java
- Student.java

In addition, each .java file must contain the following information at the top:

```
//Your name
//CS141
//Assignment 3
//Date
```

Due: Monday, April 30, 4.00 PM