Individual Programming Project
Project 1. GPA Calculator

CISC 1115 Section TY5
Introduction to Programming Using Java
Instructor: Professor Hui Chen

Contents

1 Project Overview

This individual project is about design and implement a Java application that allows a user to compute GPA from several courses completed, e.g., courses completed in a semester. It must meet the requirements specified in Section 3.

1.1 Objectives

When approaching this project, you should consider the following learning objectives.

1. Students should understand the concept of a program, and can compose, compile, run, debug, and trace a program.

2. Students understand primitive data types, and can declare variables, and use the variables of different data types in a program.

3. Students can use the selection structure (e.g., the one-way if statement, the two-way if statement, the mulit-way if statement, the nested if statement, and the switch statement).

4. Students can design and implement console applications including use a Scanner object to read the user's inputs.

5. Students can use the System.out object to display program output in a desired format.
6. Students can use logical operators and boolean expressions in their programs.
7. Students can use numeric operators and expressions in their programs.

2 Constraints

To meet the requirements in Section 3, you should *not* use loops (that we have not discussed), additional method other the main method (that we have also not discussed), and Java classes and methods that help you format outputs (e.g., the `printf` method and the `Formatter` class should not be used.)

3 Requirement

The program as a whole should meet the following requirements.

3.1 Entering Data about Multiple Courses

The program should prompt the user to enter the data about 0 to 4 courses. The information for a course should include,

1. Course number, e.g., CISC1115 (without a space)
2. Course credits, e.g., 5
3. Course letter grade. To meet this requirement, you must support letter grades of A, B, C, D, and F.

Listings 1, 2, 3, and 4 are four examples.

3.2 Stopping Data Input

The program should cease to ask the user for more courses if the user entered “Done” as the course name. Listings 1, 2, 3, and 4 are four examples showing how the program is required to behave when the user wishes to stop entering the data.

Listing 1: Data Input Example

```
$ java GPACalculator
Enter course number: Done
  Course        Credits Grade   Grade Points
   Total        0               0.0
     GPA                        N/A
$
```

Listing 2: Data Input Example

```
$ java GPACalculator
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: 5
Enter course number: Done
  Course        Credits Grade   Grade Points
CISC1115        5       A       4.0
   Total        5               20.0
     GPA                        4.000
```

Listing 3: Data Input Example

```
$ java GPACalculator
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: 5
Enter course number: MUSI1199
Enter letter grade for MUSI1199: B
Enter credit hours for MUSI1199: 3
Enter course number: Done
  Course        Credits Grade   Grade Points
CISC1115        5       A       4.0
MUSI1199        3       B       3.0
   Total        8               29.0
     GPA                        3.625
$
```

Listing 4: Data Input Example

```
$ java GPACalculator
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: 5
Enter course number: MUSI1199
Enter letter grade for MUSI1199: B
Enter credit hours for MUSI1199: 3
Enter course number: ENGL1100
Enter letter grade for ENGL1100: A
Enter credit hours for ENGL1100: 3
Enter course number: MATH1209
Enter letter grade for MATH1209: A
Enter credit hours for MATH1209: 4
  Course        Credits Grade   Grade Points
CISC1115        5       A       4.0
MUSI1199        3       B       3.0
ENGL1100        3       A       4.0
MATH1209        4       A       4.0
   Total        15              57.0
     GPA                        3.800
$
```

3.3 Input Validation

The program should have validate inputs. The following example (Listing 5) shows how the behaves when the user enters a unrecognized grade.

Listing 5: Input Validation Example

```
$ java GPACalculator
Enter course number: CISC1115
Enter letter grade for CISC1115: Z
Grade Z is not recognized
$
```

3.4 GPA Calculation

The program should compute and display the GPA based on the input. Listings 1, 2, 3, and 4 are examples.

3.5 Output Formatting

The program should format the output nicely. In particular, the program should display the calculated GPA with 3 digits after the decimal point. For this, you should note that the program still proint out 3 digits after the dicimal point when the GPA has no fractions, e.g., displaying 4.000, 3.000, and 2.000 instead 4.0, 3.0, and 2.0. Listings 1, 2, 3, and 4 are examples.

4 Submission

Use CUNY dropbox to submit the work. In the top level folder corresponding to the journal on CUNY dropbox, add the "project1" folder, and upload all your project files in the folder. You should observe the deadline posted on the schedule page of the class web site. You should also note that although you submit the project in the journal folder on CUNY dropbox, this directory is evaluated as a project, not as part of the journal.

4.1 Readme File

When submitting your work, add a Readme file (called Readme.txt) to the project folder. In the Readme file, state the following "*My name is YOUR_NAME. My CUNY ID is YOUR_CUNY_EMPL_ID. I certify that this assignment is my own work, based on my personal study and/or research and that I have acknowledged all material and sources used in its preparation, whether they be books, articles, reports, lecture notes, and any other kind of document, electronic or personal communication. I also certify that this assignment has not previously been submitted for assessment in any other unit, except where specific permission has been granted from all unit coordinators involved, or at any other time in this unit, and that I have not copied in part or whole or otherwise plagiarised the work of other students and/or persons.*" Don't forget to replace YOUR_NAME and YOUR_CUNY_EMPL_ID by your actual name and ID number.