Individual Programming Project
Project 2. GPA Calculator Improved

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 besides the objectives in Project 1.

1. Students should understand the concept of loops and nested loops and use loops in their programs.

2. Students should understand `breaek` and `continue` statements.

2 Constraints

To meet the requirements in Section 3, you must use loops in your program, and use `System.out.printf` to control the format of the output of your program. It is also required that you must use `continue` and `break` (at least once each) in your code to control the loops.

3 Requirement

The program as a whole should meet the following requirements.

3.1 Entering Course Data for Multiple Semesters

The program should prompt the user to enter the course data for one or more semesters.

3.2 Stopping Data Input for Semesters

The program should cease to ask the user for more courses if the user entered "DoneSemester" as the semester name. Listings 1, 2, 3, 4, and 5 are examples showing how the program is required to behave when the user wishes to stop entering the data.

3.3 Entering Multiple Course Data for A Semester

The program should allow the user to enter 0 or more courses for each semester. 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, 4, and 5 are examples.

3.4 Stopping Data Input for A Semester

The program should cease to ask the user for more courses if the user entered "DoneCourse" as the course name. Listings 1, 2, 3, 4, and 5 are examples showing how the program is required to behave when the user wishes to stop entering the data.

3.5 Input Validation

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

3.6 GPA Calculation

The program should compute and display the GPA for each semester and that for all semesters based on the input.

Listings 1, 2, 3, 4, and 5 are examples.

3.7 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 of 4.0, 3.0, and 2.0. Listings 1, 2, 3, 4, and 5 are are examples.

Listing 1: Data Input Example

```
$ java GPACalculator
Enter semester: DoneSemester
Total Credits:                                                    0
Total Points:                                                 0.000
Overall GPA:                                                    N/A
$
```

Listing 2: Data Input Example

```
$ java GPACalculator
Enter semester: Fall2021
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: 5
Enter course number: DoneCourse
Semester: Fall2021
Semester Credits:                                                 5
Semester Points:                                             20.000
Semester GPA:                                                 4.000
Enter semester: DoneSemester
Total Credits:                                                    5
Total Points:                                                20.000
Overall GPA:                                                  4.000
$
```

Listing 3: Data Input Example

```
$ java GPACalculator
Enter semester: Spring2020
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: 5
Enter course number: MUSI1110
Enter letter grade for MUSI1110: B
Enter credit hours for MUSI1110: 4
Enter course number: DoneCourse
Semester: Spring2020
Semester Credits:                                                 9
Semester Points:                                             32.000
Semester GPA:                                                 3.556
Enter semester: Fall2021
Enter course number: CISC3115
Enter letter grade for CISC3115: A
Enter credit hours for CISC3115: 4
Enter course number: DoneCourse
Semester: Fall2021
Semester Credits:                                                 4
Semester Points:                                             16.000
Semester GPA:                                                 4.000
Enter semester: DoneSemester
Total Credits:                                                   13
Total Points:                                                48.000
Overall GPA:                                                  3.692
$
```

Listing 4: Data Input Example

```
$ java GPACalculator
```

```
Enter semester: Fall2021
Enter course number: DoneCourse
Semester: Fall2021
Semester Credits:                                                    0
Semester Points:                                                 0.000
Semester GPA:                                                      N/A
Enter semester: DoneSemester
Total Credits:                                                       0
Total Points:                                                    0.000
Overall GPA:                                                       N/A
$
```

Listing 5: Input Validation Example

```
$ java GPACalculator
Enter semester: Fall2021
Enter course number: CISC1115
Enter letter grade for CISC1115: Z
Grade Z is not recognized
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: -1
Credits -1 is negative, and not allowed
Enter course number: CISC1115
Enter letter grade for CISC1115: A
Enter credit hours for CISC1115: 4
Enter course number: DoneCourse
Semester: Fall2021
Semester Credits:                                                    4
Semester Points:                                                16.000
Semester GPA:                                                    4.000
Enter semester: DoneSemester
Total Credits:                                                       4
Total Points:                                                   16.000
Overall GPA:                                                     4.000
$
```

4 Submission

Use CUNY dropbox to submit the work. In the top level folder corresponding to the journal on CUNY dropbox, add the "project2" 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.