Project #3 (70 points)

Due Date

Monday, November 1, by 11:59pm.

Submission

- You must include both team members' names in the comment block on top of EVERY Java file.
- Your project folder must include the following **subfolders/files for grading**.
  - Source folder, including all Java files [50 points]
    - *.java from Project #2
    - 3 JavaFX related files.
      (1) the Java file that contains the public static void main(), which has only one method launch(); for example, the default file name in Eclipse is Main.java.
      (2) the controller Java file; one controller file ONLY; the file name must contain the keyword "controller", for example, MainController.java.
      (3) the view file; this is the fxml file; one fxml file ONLY; the file name must contain the keyword "view", for example, MainView.fxml.
  - Test design document [15 points]
  - Javadoc [5 points]

Project Description

You will develop a GUI (graphical user interface) with JavaFX for the software system you developed in Project 2. The GUI shall replace the TuitionManager class in Project 2, i.e., Project 3 is a GUI version of Project 2. The GUI must provide the following functionalities.

1. Add and remove any type of students defined in Project 2.
2. Provide the interface to enter necessary data items for different student types.
3. Make one-time or multiple-time tuition payments.
4. Enter or update the financial aid amount for eligible students.
5. Change the study abroad status for an international student.
6. Calculate tuition due for a single student or for all students in the roster.
7. Print the roster on the GUI in 3 different sequences.
   - all students, by the current order in the roster
   - all students, by the student names
   - print only the students with payments, by the last payment dates

Project Requirements

1. This is a **group assignment**. You MUST work in pair in order to get the credit for this project.
2. You MUST follow the software development ground rules, or **you will lose points** for not having a good programming style.
3. Each Java class must go in a separate file. **-2 points** if you put more than one Java class into a file.
4. You MUST include all the classes from Project 2 and use them in this project, EXCEPT the TuitionManager class and RunProject2 class. **-2 points** for each class not used. Note that, if you lose points on Project 2, you must fix the issues, or you will lose points again for the same cause! For the classes imported from Project 2, you cannot use any Java library classes EXCEPT DecimalFormat and Calendar class, or you will **lose 5 points.** If you use **ArrayList class** in those classes**,** you will **lose 10 points.**

5. Project 3 uses the Model-View-Controller (MVC) design pattern. You must use only ONE JavaFX fxml file for the "view", ONE Controller class for the "control", and ALL the classes from Project 2 for the "model". In addition, there will be ONE Java file contains the main() method to "launch" the GUI version of the tuition management system. **You will get 0 points** if you don't follow the MVC structure.

6. You can design your own GUI, however, your GUI must include the following JavaFX components.
    (a) Use at least 4 different Layout Panes, such as BorderPane, GridPane, VBox, Hbox, etc., or **-5 points.**
    (b) Use a TextArea to display messages or output data, or you will **lose 5 points**. All output MUST be appended to the TextArea. **You are NOT ALLOWED to use System.out** in ALL CLASSES, **or you will lose 10 points**. This means you must modify all the print() methods in the Roster class to return a string, or define a **toString() method** in the Roster class.
    (c) Use RadioButton group for single-select items, or **-2 points**, for example, student types or major, etc.
    (d) You must disable not applicable items, **-2 points for each violation;** for example,
        o Only fulltime students are eligible for financial aid, or discounts.
        o Only International student has the status of study abroad
        o Only tristate student can check New York or Connecticut, i.e., only these 2 states are eligible for discount.
    (e) You MUST set the title of the primaryStage (title for the window.) or **-2 points.**

7. You are required to **generate the Javadoc** after you properly commented your code. Your Javadoc must include the documentations for the constructors, private methods and public methods of all Java classes (*.java files.) You **must comment the Main.java and Controller class** and include them in the Javadoc. DO NOT include the *.fxml file, which is NOT a java file. Generate the Javadoc in a single folder and include it in your project folder to be submitted to Canvas. You are responsible to double check your Javadoc after you generated them. The grader will navigate the Javadoc with the "index.html". You will **lose 5 points** for not including the Javadoc, OR, the grader cannot navigate your Javadoc through the "index.html".

System Testing

1. You MUST create a test document and design the test cases for testing Project 3. The test document **is worth 15 points.** Use the test cases provided in Project 2 (project2TestCases.txt) as a reference to design your test cases. For example,
    • adding and removing different types of students,
    • computing tuition dues,
    • making payments,
    • update study abroad status for the international students
    • enter the financial aid amounts
    • enter all possible invalid input or trigger any exceptions
    • other test cases based on your GUI design

2. Use your test cases to manually test your GUI. All invalid data should be rejected by the GUI. Proper error messages must be displayed in the TextArea. **You will lose 2 points** for each invalid condition not rejected, or error message not properly displayed in the TextArea.

3. Your program must always run in a sane state and **should not crash in any circumstances**. The graders will try to produce exceptions while running your GUI. You must catch all Java Exceptions. Your program shall continue to run until the user stops the program execution or closes the window. **You will lose 2 points** for each exception not caught.