# CIS 611
# Spring 2017
# Individual Programming Assignment: PA07 – GUI Programming

Due: Friday Mar 31, 2017 11:59pm

Total Points: 20

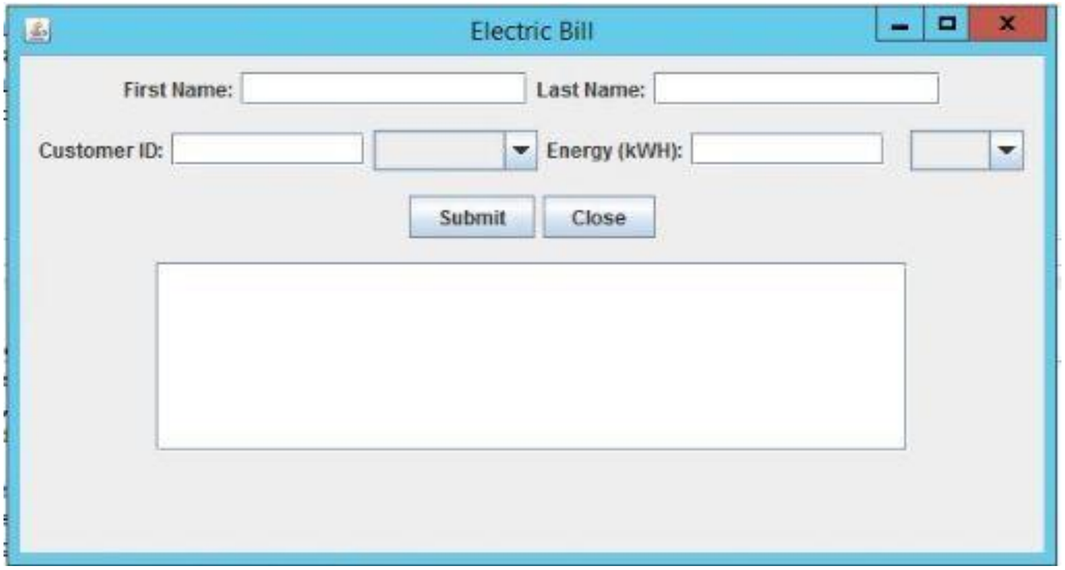
## GUI Programming

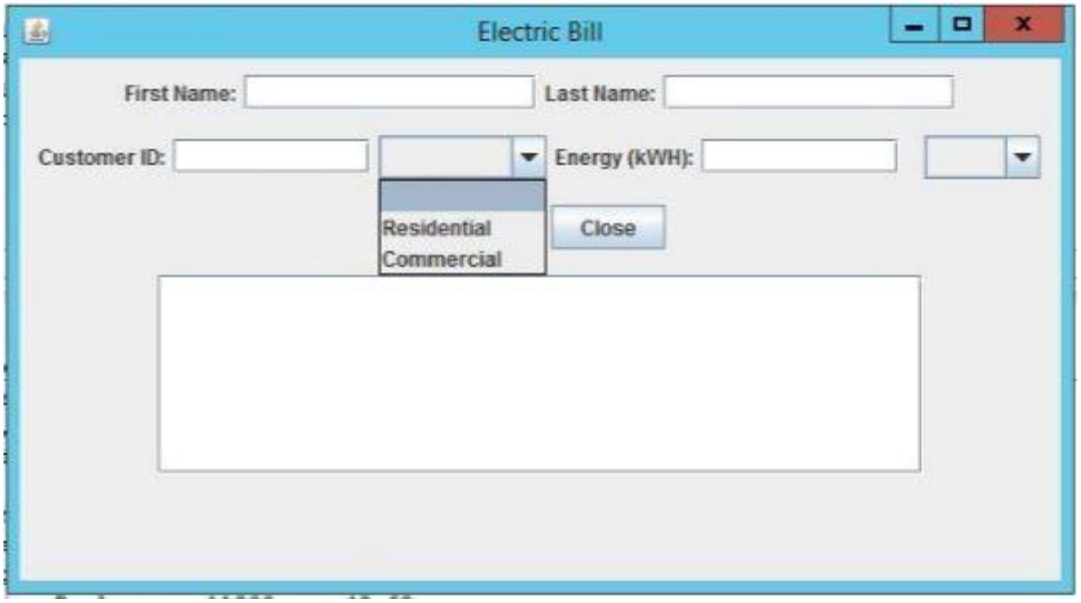
The purpose of this programming assignment is to:

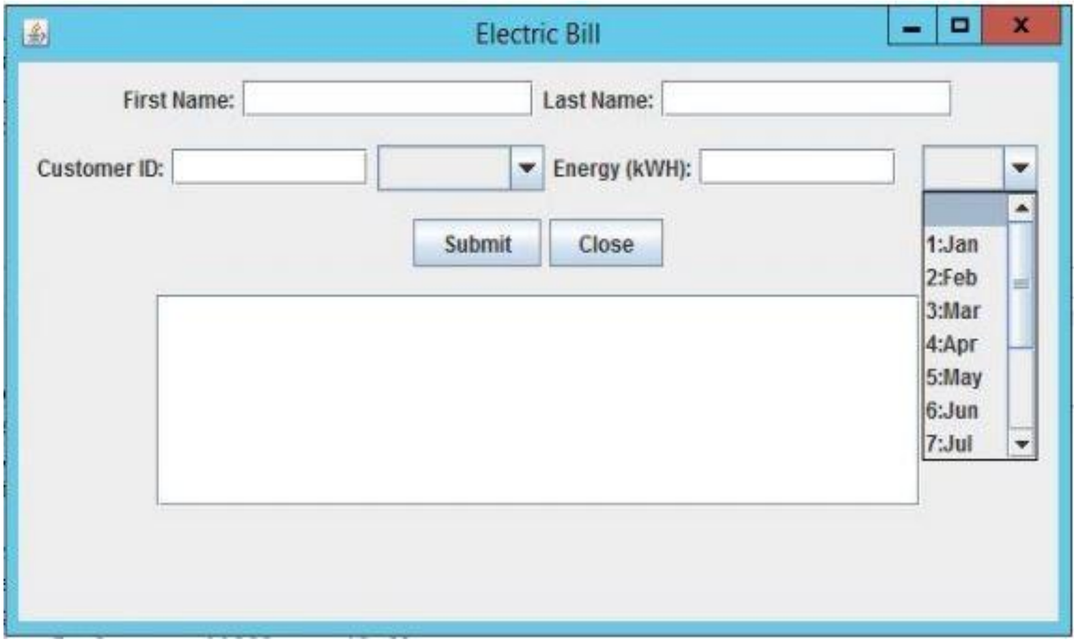
- Create user interfaces using frames, panels and simple GUI components

## Question 1: (20 Points) Electricity Bill Calculation

Write an interactive GUI program for the Electric bills problem in PA06/Q1.
The program uses a graphical user interface to interact with a user as shown below:







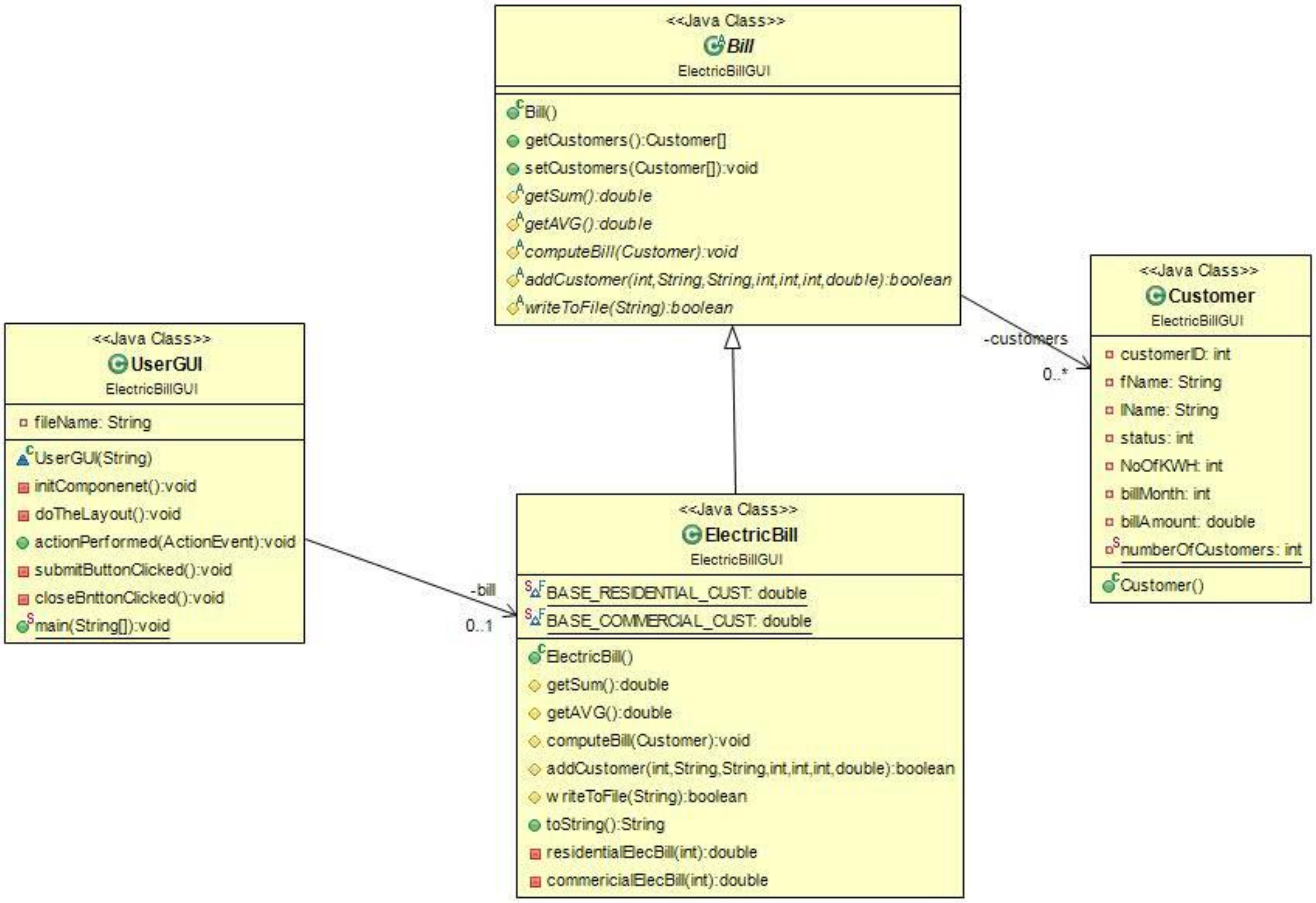
This Java program must implement the Java Application UML diagram and the associated source code files with the assignment document.

Complete the implementation of the methods' stubs in the provided Java source files.

You must maintain the same relationship between classes as shown in the UML class diagram and do not change the classes' implementation in a way violates the UML class diagram contract.

As shown in the UML diagram below, this Java application has 3 classes (***ElectricBill***, ***UserGUI*** and ***Customer*** classes) and 1 abstract class ***Bill***.

Take a close look at the UML diagram in order to perceive the relationship between these classes.



Once the program starts, it must read the customers data from text file (***customers.txt***) same as generated in PA06. The customer data in the text file is clean and does not need any validations. For every customer record in the text file, you must create a customer object and add it to the customers array.
Remember the customers' array size is 6, hence you must not exceed it in your program, so there must be appropriate check and error display when max array capacity has been reached and the ***Submit*** button must be disabled.

Then, the program displays the customer information as well as the current bills' values **sum** and **average** in the **GUI text area**.

The program also stores the new customer information in the same text file, ***customers.txt***.
The program terminates with a Goodbye message, once a user clicks on the close button.

A user clicks the submit button to create a new customer object and calculates the customer bill only if the program inputs are correctly entered. The program must not crash with invalid or required data inputs. For example, the program must not accept 0 value for customerID or customerID less than or greater than 8 digits, the number of kWH must be an integer number, a customer status must be 0 or 1, etc.

The JOptionPane class must be used to display invalid inputs' messages.

A newly added customer information must be displayed in the GUI text area, and the current bills values sum and average must be updated and displayed.

Program must adhere to the following specifications:

1. If the user does not provide valid input, the program must not abnormally abort, instead it must show a proper error message and allow the user to provide the required input.
2. Above requirement applies for invalid inputs.
3. The program must continue reading the inputs, calculating and displaying the output using **JOptionPane** showMessage box in the above format.
4. The program must have a correct logical order and output the anticipated result
5. The sequence, selection, and iteration structures must constitute correct program logic solutions to the assignment problem
6. The program must terminate gracefully as specified
7. The program must not abnormally abort with invalid/required user inputs
8. The program must terminate gracefully as specified
9. The program must not abnormally abort with invalid/required user inputs
10. You must handle invalid/required inputs in the program using try catch clauses or throws exceptions statements
11. You must follow the correct submissions format as described in this document

***<u>Evaluation Criteria:</u>***

1. You must use the class template in your program classes
2. The program must not have any compilation or runtime errors
3. All tasks must be completed to receive a complete credit for this assignment
4. The program must perform all the requirements correctly, including the read and output of data
5. The program must have a correct logical order and output the anticipated result
6. The sequence, selection, and iteration structures must constitute correct program logic solutions to the assignment problem
7. The program must terminate gracefully as specified
8. The program must not abnormally abort with invalid/required user inputs
9. You must handle invalid/required inputs in the program using try catch clauses or throws exceptions statements
10. You must follow the correct submissions format as described in this document

***Submission***

1. Zip all the java source files into one file that must be named following the provided naming format in this course, and then upload the zip file under this assignment answer in Canvas.

   ***Folder Name***: *FFLLPA07.zip (where FF = your First Name, LL = your Last Name)*

   Summary for naming conventions for this assignment:

   Name: Jim Brown
   Zipped Folder Name: JimBrownPA07.zip

**CIS611 – Spring 2017**
**PA07**

**Name: ______________________________________________**

Question 1

| Requirements | Any comment provided by grader | Max Points Allowed | Points Earned |
|---|---|---|---|
| General Code Structure:<br>Proper naming convention used for file, Comments used in the code to explain the purpose of the code, Indentation of the code for better readability, Good choice of variable names, proper implementation of the class (e.g., Abstract  Bill Class, ElectricBill, UserGUI Class). | | 5 | |
| Input, Output, User Interface:<br>Proper coding implementation of the logic to read the data and display the expected value, proper coding implementation of dialog box/boxes, general aesthetics of user interface.<br>Contains all the GUI fields, Combo boxes contain all the options, Displays the existing customer info, Accepts user inputs, Displays new customer info, Submit button disabled for > 6 customers, Output format in the text area, Handling invalid input   (no value is entered, empty space is entered, invalid data is entered), file I/O (stores the customer info). | | 5 | |
| General Algorithm and Logic: | | 10 | |

| | | | |
|---|---|---|---|
| Proper instantiation of the logic and the methods (e.g., getSum, getAVG, computeBill). | | | |
| | | 20 | |

**Total ____/20**