COMP1161: Introduction to Object Oriented Programming
Lab 8

1. Introduction

This lab aims to introduce the student to the basics of creating a graphical user interface (GUI) using Java. If you have not revied the lectures on GUI, you will not be able to do this lab.

2. Grading Criteria (Please review before starting)

Criterion	Mark(s)
Main method implemented to pass `SmogApp` object to `SmogGUI` constructor at start up.	1
Functionality of the Clear and Exit buttons (0.5 each)	1
Functionality of the Save button	1
Functionality of the Clear All button	1
Colors and error handling (fields are checked for numeric input)	1
A PENALTY OF 0.5 MARKS WILL BE APPLIED FOR EACH OF THE FOLLOWING: • Writing public methods other than those specified.	

3. Smog Level Collection

The Municipal Corporation needs a program to log smog levels surrounding the city dump. On any given day, inspectors take measurements of smog levels at various distances from the dump and record these measurements. The application needs a graphical user interface (GUI). You will create the GUI in this lab.

Specific objectives of the lab are:

- Integrating a GUI with an application
- Adding components to a GUI
- Writing listeners for GUI components
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The GUI that you will create is illustrated on the next page.

Java code for two classes is provided. The classes are:

       `SmogApp`   maintains a log of smog level readings.

       `SmogGUI`   starter code for the GUI

Please download these two classes and load them into a project for this lab. Spend a few moments to get acquainted with the code. Note especially how the Reading class is used and the methods that are defined by the `SmogApp` class.
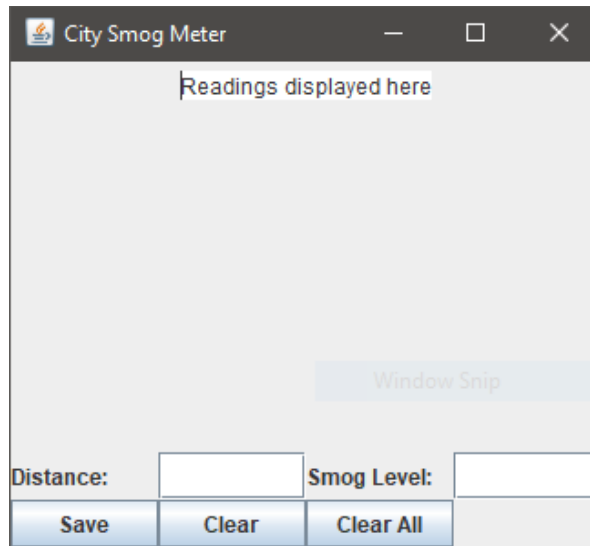
Figure 1: The Smog Meter GUI

Instructions

1. Modify the code of the `SmogGUI` class so that this class holds an instance of the `SmogApp` class as an attribute.

2. Modify the constructor of the `SmogGUI` class to accept the `SmogApp` object as a parameter.

3. Write a main method (either as part of the `SmogGUI` code, or in a tester class) that creates an instance of the `SmogGUI` class. Running this method should cause the GUI to be displayed.

4. Add a button labelled **"Exit"** to the GUI. This button shall be displayed in the last row, to the right of the button labelled **"Clear All"**.

5. Change the colours of the form to colours of your pleasing.

6. Implement listeners for the buttons as follow:

   a) When the **Clear** button is clicked the fields labelled **Distance**, and **Smog Level** should be cleared.

   b) When the **Clear All** button is clicked, the GUI shall invoke the appropriate method of the `SmogApp` object to clear the list of readings and shall also update the display.

   c) When the **Exit** button is clicked the GUI shall close.

   d) When the **Save** button is clicked the GUI shall check the fields labelled Distance and Smog Level for the values entered there. If either field is blank, or contains an illegal value (i.e. not numeric) then nothing should be done. If the data in the fields is acceptable than the GUI shall invoke the `addReading` method of the `SmogApp` object to store the new readings and shall also cause the display of readings to be updated.

4. Get Graded

You must get your work graded by a Lab Tech before the end of the lab – even though we will demonstrate that your program works, you must have entries in the tables before you get graded.

5. Submit

Download your files from *repl* and submit a zip file using the submission link on OurVLE with your *SmogAPP.java* and *SmogGUI.java* files. Ensure that you **put your id number as a comment on the first line of each file**.