**Assessment Instructions**

**Instructions:** Write a program to calculate your CO2 footprint based on the amount of electricity used in your home each year.

1. If the Assessment project has not yet been created in the Unit08 Assessments folder, please do so now.

2. Be sure to save a copy of these instructions in the Unit08 Documents folder.

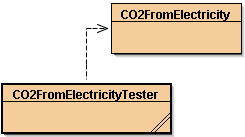
3. Print a copy for your notebook.

4. Carefully read the instructions before you attempt the assessment.

5. Create classes called **CO2FromElectricity** and

**CO2FromElectricityTester** in the newly created project folder.

6. The program should be written in OOP



format by explicitly creating an object of the **CO2FromElectricity** class**.**

7. Open the Class Documentation file in

your web browser. This file contains documentation on how to write the **CO2FromElectricity** class.

8. You will need the [Home Electricity Bill Record Worksheet](08.10_Home%20Electricity_Bill_Record_Sheet.pdf) that you downloaded at the beginning of the unit. If you have not yet recorded this information, you need

to complete the worksheet now. Try to have at least three months of data.

9. The annual amount of CO2 emissions from home electricity use is calculated as follows:

***Emissions*** =

***Avg*. *Monthly Electricity Bill* \* *Emission Factor* \* *Months***

***Avg*. *Price per KWH***

***where*, *Emission Factor*** = **1.37**

***Months*** = **12**

10. Assign the monthly electric bill data to an **ArrayList** with the **add()** method.

11. Assign the monthly price of electricity to a second **ArrayList**, also using the

**add()** method. (See the CalculatingWithArrayLists.java demo program.)

12. In order to use the equation shown above, you will need to know the average monthly electric bill and the average price of electricity per kilowatt-hour (KWH). Use the values shown for the Emission Factor and Months.

13. Print the results in a user-friendly format to one decimal place (see expected output).

14. Create a pseudocode algorithm before you begin coding.

15. Using a word processor, create a class diagram for the **CO2FromElectricity**

class. (The class documentation will help guide you.)

**Expected Output:** When your program runs correctly you should see output similar to the following screen shot:



**Grading:** Your assessment will be graded according to the following rubric.

|  |  |
| --- | --- |
| **Grading Rubric** | **Pts** |
| Comments include name, date, and purpose of program. | 1 |
| Source code written in two classes. | 2 |
| Constructor correctly written. | 1 |
| Statement to invoke constructor included. | 2 |
| Method headers correctly written. | 2 |
| Individual methods invoked on an object from **main()** method. | 2 |
| All calculations correct. | 1 |
| Output formatted with **printf()**. | 1 |
| No compiler or runtime errors. | 1 |
| Class diagram included. | 1 |
| Thoughtful PMR included. | 1 |

**Submission:** Submit the files for the CO2FromElectricity and CO2FromElectricityTester classes, as well as the class diagram, for a grade.