# 08.10 Assignment Instructions

Instructions: Write a program to calculate your CO_2 footprint based on the amount of electricity used in your home each year.

1. If the 08.10 Assignments project has not yet been created in the Mod08 Assignments folder, please do so now.
2. Be sure to save a copy of these instructions in the Mod08 Documents folder.
3. Print a copy for your notebook.
4. Carefully read the instructions before you attempt the assignment.
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 08.02 Class Documentation file in your web browser. This file contains documentation on how to write the **CO2FromElectricity** class.
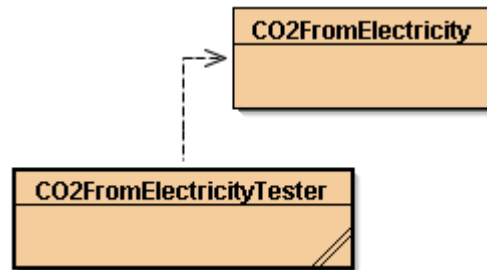
8. You will need the Home Electricity Bill Record Worksheet that you downloaded at the beginning of the module. If you have not yet recorded this information, you need to complete the worksheet now. Try to have at least three months of data.
9. The annual amount of CO2 emissions from home electricity use is calculated as follows:

$$Emissions = \frac{Avg.\ Monthly\ Electricity\ Bill}{Avg.\ Price\ per\ KWH} * Emission\ Factor * Months$$

$$where,\ Emission\ Factor = 1.37$$
$$Months = 12$$

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:

```
Average Monthly Electicity Bill: 191.23
Average Monthly Electicity Price: 0.11
Annual CO2 Emissions from Electricity Usage:  28667.1 pounds
```

Grading: Your assignment 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, as Assignment 08.10 for a grade.