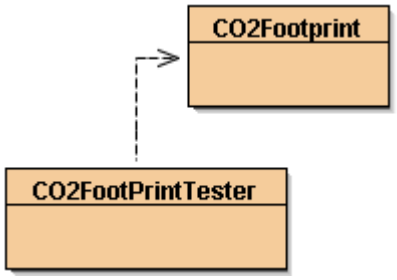
08.12 Assignment Instructions

Instructions: Write a program that models an individual's CO_2 production and reduction.

1. If the 08.12 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. Read the instructions carefully before you attempt the assignment.
5. The program should be written in OOP format using a tester class.
6. For the data structure, use either an array of objects or an **`ArrayList`**.
7. Create a minimum of five different objects.
8. Your CO2 footprint should account for the following:
    - annual estimate of gasoline used
    - annual estimate of electricity used
    - annual household waste produced
    - annual household waste recycled
    - replacement of incandescent bulbs



9. The constructor should include the following parameters:

    - annual gasoline used
    - average electricity bill and average electricity price
    - number of people in home
    - recycle paper, plastic, glass, or cans (Booleans)
    - number of light bulbs replaced

10. You have already written programs for gasoline use, electricity use, waste produced, and waste recycled, so you may reuse any of the existing code.
11. Emission reduction from the replacement of one 75 watt incandescent bulb with a 25 watt ENERGY STAR compact fluorescent light bulb can be calculated as follows:

    Emission Reduction = Number of Bulbs * 1.37 * 73

12. Print the results in a user-friendly format (see expected output).
13. Create a pseudocode algorithm before you begin coding.
14. Using a word processor, create a class diagram for the **`CO2Footprint`** 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. (Your results will show five rows of data.)

```
|                Pounds of CO2             |       Pounds of CO2         |                  |
|                Emmitted from             |       Reduced from          |                  |
|    Gas     |    Electricity  |   Waste   |   Recycling  |   New Bulbs  |   CO2 Footprint  |
|============|=================|===========|==============|==============|==================|
|  48000.00  |      16440.00   |  1018.00  |     422.00   |      100.0   |       64935.99   |
|  38400.00  |      16111.20   |  3054.00  |     691.80   |      500.1   |       56373.35   |
```

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.	3
Constructor correctly written.	3
Statement to invoke constructor included.	4
Method headers correctly written.	4
Individual methods invoked on an object from **`main()`** method.	4
All calculations correct.	3
Output formatted with **`printf()`**.	2
No compiler or runtime errors.	1
Class diagram included and pseudocode included.	3
Thoughtful PMR included.	2

Submission: Submit the files for the CO2Footprint and CO2FootprintTester classes, as well as the class diagram and the pseudocode algorithm, as Assignment 08.12 for a grade.