

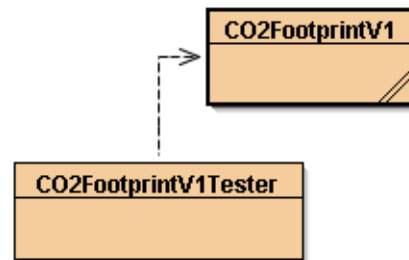
## 08.09 Assignment Instructions

**Instructions:** Write a program that calculates the amount of carbon dioxide emitted for each gallon of gas consumed. Include **javadoc** comments in the program where appropriate.

1. If the 08.09 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 a class called **CO2FootprintV1** and another one call **CO2FootprintV1Tester** in the newly created project folder.
6. The program should be written in OOP format by explicitly creating an object of the **CO2FootprintV1** class.
7. Write a method to calculate how many metric tons of CO<sub>2</sub> are emitted for the number of gallons of gas you are projected to use in a year. (This was calculated in the last assignment.) This quantity can be calculated using the following:

$8.78 \times 10^{-3}$  metric tons of CO<sub>2</sub> are emitted per gallon of gas.

8. Write another method to convert the metric tons of CO<sub>2</sub> to pounds.
9. Create **javadoc** comments for the constructor and each method in the **CO2FootprintV1** class. Use the demo program in the lesson as a model.
10. Print the results in a user-friendly format, to one decimal place (see expected output).



**Algorithmic Thinking/Planning:** There are several components to this program that require careful thought, so resist the temptation to start coding without planning.

<b>CO2FootprintV1</b>
<b>&lt;&lt;Instance Variables&gt;&gt;</b> - double myGallonsUsed - double myTonsCO2 - double myPoundsCO2
<b>&lt;&lt;Constructor&gt;&gt;</b> + CO2FootprintV1(double gals)
<b>&lt;&lt;Methods&gt;&gt;</b> + void calcTonsCO2( ) + void convertTonsToPoundsCO2( ) + double getTonsCO2( ) + double getPoundsCO2( )

To help you plan your approach to the program, a class diagram is provided.

Use the diagram to write the **CO2FootprintV1** class. With some careful analysis, this class diagram will also help you write the **CO2FootprintV1Tester** class.

You may use different identifier names if you prefer, or the ones shown here.

**Expected Output:** When your program runs correctly you should see output similar to the following screen shot. (The table will grow considerably in future lessons.)

```

                CO2 Emissions
Gallons   Pounds      Tons
of Gas    from Gas    from Gas
*****
1288.0    24931.28    12.466

```

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

Grading Rubric	Pts
Comments include name, date, and purpose of program.	1
<b>javadoc</b> comments accurately produce an API-style web page.	2
Constructor correctly written.	2
Statement to invoke constructor included.	2
Method headers correctly written.	2
Individual methods invoked on an object from <b>main( )</b> method.	2
All calculations correct.	1
Output formatted with <b>printf( )</b> .	1
No compiler or runtime errors.	1
Thoughtful PMR included.	1

**Submission:** Submit the CO2FootprintV1.java and CO2FootprintV1Tester.java files as Assignment 08.09 for a grade.