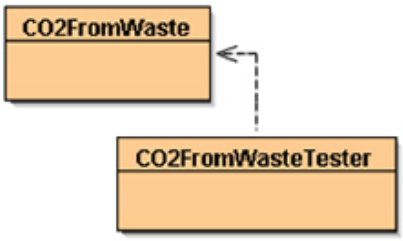
08.11 Assignment Instructions

Instructions: Write a program that calculates the amount of carbon dioxide produced in a year from waste by a household and compare how recycling can reduce the CO_2 footprint.



1. Create an 08.11 Assignment project in the Mod08 Assignments folder.
2. Carefully read the instructions before you attempt the assignment.
3. You will benefit from writing a pseudocode algorithm and a class diagram before you actually start writing code.
4. Create two new classes named **`CO2FromWaste`** and **`CO2FromWasteTester`**.
5. The program should be written in OOP format. An **`ArrayList`** filled with objects of the **`CO2FromWaste`** class is needed as part of the design.
6. Use the following constructor header for the CO2FromWaste class. Remember, boolean values can only be **`true`** or **`false`**.

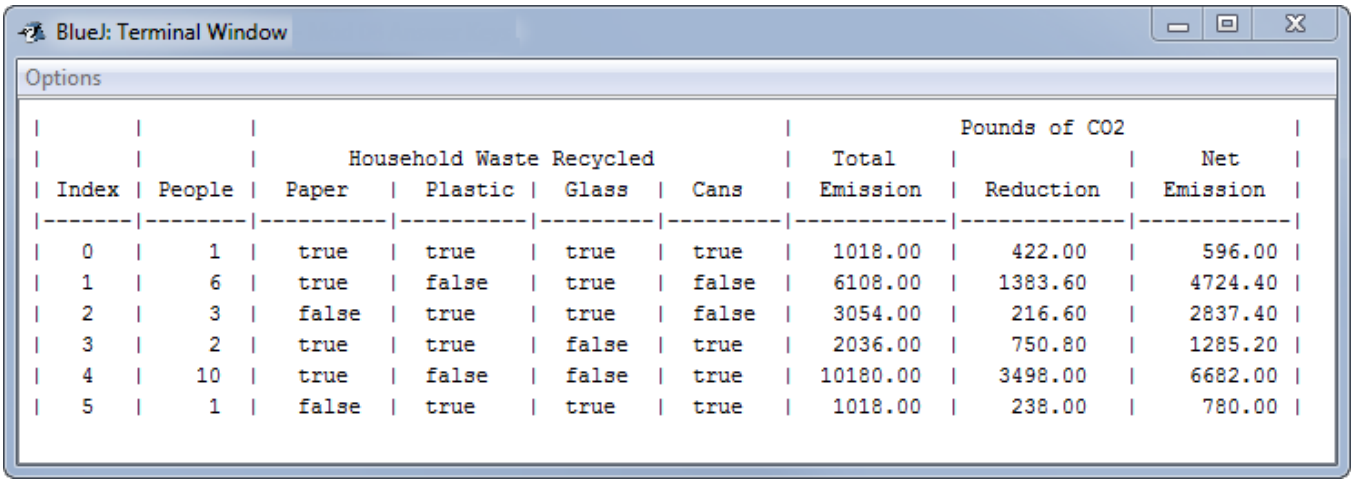
   ```
   CO2FromWaste(int numPeople, boolean paper, boolean plastic, boolean glass, boolean cans)
   ```
7. Your program should include the following methods:

   ```
   public void calcGrossWasteEmission()
   public void calcWasteReduction()
   public void calcNetWasteReduction()
   ```
8. Values to be used in the calculations can be reviewed in the **`Background Information`** section below.
9. Add records for at least six households to the ArrayList. A sample set of values could be: 3, true, false, true, true. This household consists of three people. They recycle paper, glass, and cans, but not plastic. Vary the value of the arguments for each household to produce interesting results.
10. Print the results in a user-friendly format, to one decimal place (see expected output).

Background Information:

1. On average, an individual person accounts for 1,018 pounds of CO_2 generated from household waste per year. If three people are living in a house, that value would be tripled.
2. Household CO_2 emissions can be reduced by recycling:
   a. Recycling paper reduces CO_2 emissions by 184 pounds per person.
   b. Recycling plastic reduces CO_2 emissions by 25.6 pounds per person.
   c. Recycling glass reduces CO_2 emissions by 46.6 pounds per person.
   d. Recycling aluminum cans reduces CO_2 emissions by 165.8 pounds per person.
3. Before you try to write any calculation statements, make sure you can reproduce with a calculator the results shown in the expected output.

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




```
|       |        |                                       |            Pounds of CO2            |
|       |        |       Household Waste Recycled       |   Total    |             |     Net    |
| Index | People |  Paper   |  Plastic |  Glass  |  Cans   |  Emission  |  Reduction  |  Emission  |
|-------|--------|----------|----------|---------|---------|------------|-------------|------------|
|   0   |      1 |   true   |  true    |  true   |  true   |   1018.00  |    422.00   |     596.00 |
|   1   |      6 |   true   |  false   |  true   |  false  |   6108.00  |   1383.60   |    4724.40 |
|   2   |      3 |   false  |  true    |  true   |  false  |   3054.00  |    216.60   |    2837.40 |
|   3   |      2 |   true   |  true    |  false  |  true   |   2036.00  |    750.80   |    1285.20 |
|   4   |     10 |   true   |  false   |  false  |  true   |  10180.00  |   3498.00   |    6682.00 |
|   5   |      1 |   false  |  true    |  true   |  true   |   1018.00  |    238.00   |     780.00 |
```

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