Assignment #4

Variables and Names

You can print things out with `System.out.println` and you can do math. The next step is to learn about variables. In programming a variable is nothing more than a name for something so you can use the name rather than the something as you code. Programmers use these variable names to make their code read more like English, and because programmers have a lousy ability to remember things. If they didn't use good names for things in their software they'd get lost when they came back and tried to read their code again.

If you get stuck with this exercise, remember the tricks you've been taught so far for finding differences and focusing on details:

1. Write a comment above each line explaining to yourself what it does in English.
2. Read your `.java` file backwards.
3. Read your `.java` file out loud, saying even the punctuation and symbols.

```
public class VariablesAndNames
{
    public static void main( String[] args )
    {
        int cars, drivers, passengers, cars_not_driven, cars_driven;
        double space_in_a_car, carpool_capacity, average_passengers_per_car;

        cars = 100;
        space_in_a_car = 4.0;
        drivers = 30;
        passengers = 90;
        cars_not_driven = cars - drivers;
        cars_driven = drivers;
        carpool_capacity = cars_driven * space_in_a_car;
        average_passengers_per_car = passengers / cars_driven;


        System.out.println( "There are " + cars + " cars available." );
        System.out.println( "There are only " + drivers + " drivers
available." );
        System.out.println( "There will be " + cars_not_driven + " empty cars
today." );
        System.out.println( "We can transport " + carpool_capacity + " people
today." );
        System.out.println( "We have " + passengers + " to carpool today." );
        System.out.println( "We need to put about " +
average_passengers_per_car + " in each car." );
    }
}
```

Note: The _ in `space_in_a_car` is called an underscore character. Find out how to type it if you do not already know. We use this character a lot to put an imaginary space between words in variable names.

What You Should See

```
U:\My Documents\CompSci\>java VariablesAndNames
There are 100 cars available.
There are only 30 drivers available.
There will be 70 empty cars today.
We can transport 120.0 people today.
We have 90 to carpool today.
We need to put about 3.0 in each car.

U:\My Documents\CompSci\>
```

What You Should Do on Your Own

1. I used 4.0 for `space_in_a_car`, but is that necessary? What happens if it's just 4?
2. Remember that 4.0 is a "floating point" number. Find out what that means.
3. Write comments above each of the variable assignments.
4. Make sure you know what = is called (equals) and that it's making names for things.
5. Remember _ is an underscore character.
6. What is the difference between = (single-equal) and == (double-equal)?