### Assignment #8 -- World Population!

**Objectives**:

* apply techniques you have learned this quarter in one final project
* specifically work with files, strings, lists, counters, and accumulators

**Instructions**:

For this assignment, you will write a program that reads data from a file and shows a report to the user.

**Program Specification**

Here is a link to a data file:

[WorldData2012.txt](http://facweb.northseattle.edu/nyrusina/CSC110%20(Fall%202016)/Hw/HW8/WorldData2012.txt" \t "_blank)

that contains population and land area data for hundreds of countries (and other geo-political units) adapted from [this web site](http://www.geohive.com/earth/world.aspx).  Each line in the file contains the name of a country, the population, and the land area, in that order.  Your job is to write a program that analyzes this data in various ways and shows a report to the user.  Here is what the program output should include:

* the total number of countries in the list
* the total world population
* the name and population of the country that has the highest population
* the name and population of the country that has the lowest population
* the name and land area of the country that has the greatest land area
* the name and land area of the country that has the smallest land area
* the name and population density of the country that has the highest population density
* the name and population density of the country that has the lowest population density
* average population density (the average of the population densities of all the countries, not the population density of the planet as a whole)
* a list of "densely populated countries" (those with a population density that is more than two times the average)
* a list of "very sparsely populated countries" (those with a population density that is less than 1% of the average)

Note: land area is given is square kilometers (sq. km.), and "population density" is defined as "population per square kilometer."

**Development Tips:**

1. Plan your program carefully on paper before you start writing code.  You may find the sample program illustrating the 'split' method to be a useful reference.
2. How can you convince yourself that your program is producing correct results with such a large data file?  Consider creating a shorter file with the same format for initial testing purposes so that you can verify calculated results by hand.
3. Here's one way to accomplish the last two tasks:

* The first time you read through the file, include an accumulator that allows you to determine the average of the population densities of all the countries.  Just calculate the population density for each country as you go, and then use the normal "find the average" pattern to determine the average value.
* Read through the file a second time and use "sifting" operations to fill in the two lists.

**Example for Testing**

Total number of countries is 229

Total world population is 6950773863.000000 people

China has the highest population - 1347565324 people

Holy See has the lowest population - 459 people

Russian Federation has the greatest land area - 17075200.00 sq.km

Holy See has the smallest land area - 0.44 sq.km

Macao SAR has the highest population density - 19847.54 people/sq.km

Greenland has the lowest population density - 0.03 people/sq.km

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Average population density is 398.70

----------------------------------------

A list of densely populated countries (people/sq.km)

(those with a population density that is more than two times the average)

----------------------------------------

Bahrain 1990.28

Bangladesh 1045.09

Bermuda 1227.87

Gibraltar 4302.06

Holy See 1043.18

Hong Kong SAR 6522.15

Macao SAR 19847.54

Maldives 1066.94

Malta 1322.33

Monaco 17713.50

Singapore 7486.19

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

A list of sparsely populated countries (people/sq.km)

(those with a population density that is less than 1% of the average

----------------------------------------

Australia 2.94

Botswana 3.38

Canada 3.44

Falkland Islands (Malvinas) 0.25

French Guiana 2.84

Greenland 0.03

Guyana 3.52

Iceland 3.15

Libyan Arab Jamahiriya 3.65

Mauritania 3.44

Mongolia 1.79

Namibia 2.82

Suriname 3.24

Western Sahara 2.06