**HW 7 -- Tornadoes in Alabama**

**Instructions**: For this assignment, you will write a program that **reads data about Tornadoes in Alabama from a file and processes that data in several different ways, including writing a report to a different file.**

**Data File Format**

|  |
| --- |
| 1995  37  7  215  1996  33  7  87  ... |

The data about tornadoes we will work with is stored in a simple text file.  Each line of the file contains one of 4 different things:

* a year
* the total number of tornadoes for that year
* the number of fatalities
* the number of injuries

The file format is highly structured.  Years are listed in order.  On the line after each year is the total number of tornadoes for that year.  On the next line is the number of fatalities people for that year.  On the next line is the number of injured people for that year.  This sequence is repeated for each year.  The first two years of data from one of the sample files are shown at right to illustrate this.  Here are links to еру sample file: **Tornado.txt** [Data source:  [http://www.tornadohistoryproject.com/](http://www.sos.wa.gov/elections/voter_participation.aspx) ]

**Program Specification**

Write a program that does the following:

* Allow the user to specify the name of an input file containing data about tornadoes (that way, different data files can be tested).
* Read the data from the file and write a report out to a new file as follows:
  + The name of the output file should be the name of the input file preceded with the word 'REPORT-'.  So, if the input file is named 'Tornado.txt', then the output file should be named 'REPORT-'Tornado. Your program should work with any properly formatted data file -- not just the one listed here.
* Finally, show the following information in the Python shell window and write the same information in the report file in a nicely-formatted, easy to understand report:
  + The period of observation of the tornado
  + The total number of tornadoes, fatalities, and injuries
  + The average number of tornadoes, fatalities, and injuries
  + How many and in what year did the maximum number of tornadoes occur?
  + How many and in what year did the minimum number of tornadoes occur?
  + The same information about fatalities and injuries
  + The last line in the Python shell window should be a sentence showing the name of the report file and information about the successful ending.

**Development Tips:**

1. Use a loop to read the data from the file and process the data.  Only one loop is needed to do everything!
2. Use a **counter** to count the total number of years.
3. Use **variables** which determine the min and max values.
4. Use **accumulators** to add up the number of tornadoes, fatalities, and injuries.  You will three accumulators.
5. Remember that counters and accumulators always need to be **initialized** before the beginning of the loop.
6. Plan your program carefully on paper before you start writing code.  Remember that you need to "process" the file **one record at a time**.  You can't "jump around" to get the info you need like you can do as a human reader.  "**Be the computer!**"  
       
   The easiest solution involves a loop that repeats one time for each YEAR.  Hint: if you have a line in the file with a year, the file format guarantees that it will be followed by three more lines containing the information for that year.  Thus, you can safely read those values into the program right in the body of the loop.

**Testing** -- Be sure to carefully test your program with different files.  You can create a simple, short file to make testing easy.  As always, be sure to document your testing in comments at the end of the program.  Your comments should also say if you think any part of the assignment requirements have not been met.

**Here is an example of what the report would look like for the ‘tornado.txt’ file:**

**Enter the name of the file: tornado.txt**

**For period from 1995 to 2015 in the State Alabama were:**

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

**Total tornadoes: 1118**

**Total fatalities: 379**

**Total injuries: 3848**

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

**Average tornadoes: 53**

**Average fatalities: 18**

**Average injuries: 183**

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

**Max tornadoes 145 were in 2011**

**Min tornadoes 23 were in 1999**

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

**Max fatalities 271 were in 2011**

**Min fatalities 0 were in 1999**

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

**Max injuries 2250 were in 2011**

**Min injuries 1 were in 1999**

**An output file named Report\_tornado.txt has been created.**