07.03 Assignment Instructions

Instructions: Write an OOP program to calculate the average category, pressure, and wind speed of Atlantic hurricanes that have occurred between a given year range. Also, tally the number of storms in each category according to the Saffir-Simpson scale.

1. Create a new project folder called Challenge Program in the Mod07 Assignments folder.
2. Download the **HurricaneTester.java** as starter code for your project.
3. Download the **Hurricane.java** object class and the **HurricaneData.txt** file to the new project.
4. Examine the text file to become familiar with the information it contains. The name, pressure (mb), wind speed (kts), month, and year have been provided.
5. Write your tester class. Document each section of code. Use for-each loops and traditional for loops where they are appropriate.
6. Review the code in the starter program that reads all the data from the text file and stores it in arrays.
7. Convert the wind speed from knots to miles per hour.
8. The category of each storm is not provided. Use the Saphir-Simpson Wind Speed Scale to determine the category of each storm and assign to an array.
9. Using the newly assigned arrays, create an ArrayList of Hurricane objects.
10. Ask the user to provide a range of years. Use this range to create the output. Ensure the user picked years for which you have data.
11. For the given year range, calculate the average for category, wind speed, and pressure.
12. Use the `Integer.MIN_VALUE` and `Integer.MAX_VALUE` constants. Do not use Java's `max()` or `min()` methods.
13. Print the results in a well formatted, user-friendly fashion. Complete the `toString()` method in the `Hurricane` object class. String data should be left justified. Numeric data needs to be aligned on the decimal point. Use the sample below as a guide.

Saphir-Simpson Hurricane Wind Scale: Scale used to categorize hurricanes.

Wind Speed	Category
74–95 mph	1
96–110 mph	2
111–129 mph	3

Wind Speed	Category
130–156 mph	4
157 mph or higher	5

Expected Output: Your program's output should be similar to the following screen shot. Due to the amount of information, only the top and bottom of the output generated is shown in this image.

```
                    Hurricanes 2003 - 2005

 Year     Hurricane     Category     Pressure (mb)     Wind Speed (mph)
=========================================================================
 2003     Claudette        1           979                92.06
 2003     Danny            1          1000                74.80
 2003     Erika            1           986                74.80
 2003     Fabian           4           939               143.85
 2003     Isabel           5           915               166.86
 2003     Juan             2           969               103.57
 2003     Kate             3           952               126.59
 2004     Alex             3           957               120.83
 2004     Charley          4           941               149.60
 2005     Stan             1           977                80.55
 2005     Vince            1           988                74.80
 2005     Wilma            5           882               184.12
 2005     Beta             3           962               115.08
 2005     Epsilon          1           981                86.31
=========================================================================
       Average:           2.7         955.4              117.49
       Minimum:           1           882                74.80
       Maximum:           5          1000               184.12

Summary of Categories:
   Cat 1: 12
   Cat 2:  3
   Cat 3:  5
   Cat 4:  5
   Cat 5:  6
```

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