Exercise Set 6

Introduction

Each of the following exercises comes with a starter file that includes `unittest` test cases which will be run when you run the module in IDLE. These exercises are truly bite size exercises that provide you with some Pandas practice. The starter files contain hints in some cases. All the functions that you implement will consume and operate on either `pandas.Series` or `pandas.DataFrame`.

Note that you will need to also download the `weather-ann-arbor.csv` file in order for the tests to appropriately test your solutions. *Assure that this file is in the same directory as all of your Python files for this exercise set*.

It is highly recommended that you practice loading and inspecting the data from the weather file in an interactive Python prompt. To assist you in doing this you will be provided with a Python file called `inspect_data.py` that simply loads the data from the CSV file in the current directory. You can run this file and then experiment with the `df` variable created within it.

Your code solutions will still be uploaded to CodePost for grading.

Support Files

inspect_data.py (https://cbu.instructure.com/courses/9073/files/1199697?wrap=1) (https://cbu.instructure.com/courses/9073/files/1199697/download?download_frd=1)

ex_6_0.py (https://cbu.instructure.com/courses/9073/files/1199695?wrap=1) (https://cbu.instructure.com/courses/9073/files/1199695/download?download_frd=1)

ex_6_1.py (https://cbu.instructure.com/courses/9073/files/1199694?wrap=1) (https://cbu.instructure.com/courses/9073/files/1199694/download?download_frd=1)

ex_6_2.py (https://cbu.instructure.com/courses/9073/files/1199693?wrap=1) (https://cbu.instructure.com/courses/9073/files/1199693/download?download_frd=1)

ex_6_3.py (https://cbu.instructure.com/courses/9073/files/1199692?wrap=1) (https://cbu.instructure.com/courses/9073/files/1199692/download?download_frd=1)

weather-ann-arbor.csv (https://cbu.instructure.com/courses/9073/files/1199696?wrap=1) (https://cbu.instructure.com/courses/9073/files/1199696/download?download_frd=1)

ex_6_0.py

In the `ex_6_0.py` module, complete the `max_of_sum` function. This function should consume two positional arguments, `ser_a` and `ser_b` which are `pandas.Series` types, and return the maximum value of the sum of the two series.

See notes in the starter file.

ex_6_1.py

In the `ex_6_1.py` module, complete the `filter_month` function. This function should take in two positional arguments: `ser_a` a `pandas.Series` type, and `month` which is an integer month.

Your function should filter out and return all elements of the `ser_a` Series that have the same month number as `month`. See **datetime accessor (https://pandas.pydata.org/docs/reference/series.html#accessors)** methods for assistance on the solution.

ex_6_2.py

This exercise relies on the `weather-ann-arbor.csv` data file. Don't worry, the tests load the data from the file and pass it to your function. Complete the `filter_year` function in the `ex_6_2.py` module. This function takes in two positional arguments: `temp_df`, a `pandas.DataFrame` containing the weather data and `year` an integer year.

The function should filter on the `Date` column of the data frame and return only rows for which the year matches `year`. The return type is a `pandas.DataFrame`.

See tests for more information.

ex_6_3.py

This final exercise also relies on the `weather-ann-arbor.csv` data file. As before, the tests will load the data from the file and pass it to your function.

In the module `ex_6_3.py` complete the function `station_with_lowest_low` which takes in a single positional argument: `temp_df`, a `pandas.DataFrame` containing the weather data. Your function should find and return the station ID for the weather station that had the lowest low temperature (Element == 'TMIN'). Note that the return type is `str`.

See **Computations/Descriptive Stats (https://pandas.pydata.org/docs/reference/frame.html#computations-descriptive-stats)** and the gapminder examples from module 6.2 for reference. Also note, that you'll want to filter the `Element` column for appropriate element values. Review the `weather-ann-arbor.csv` columns prior to attempting.