PHY499: Introduction to Python for Scientists

Homework Assignment 2 (23 Sept, 2016)

(NOTE: This assignment will be graded!)

Only use functions, methods, and modules that we already discussed in class to solve these assignments! Send your code to `michael.mommert@nau.edu`.

1 Working with Files and Lists

1.1 Average Temperatures of 2015

Download the file `flagstaff_climate_2015.dat` from the "assignments" directory on the `github` website. It contains the high and low temperature, as well as the precipitation in inches, measured for every day in 2015 in Flagstaff.

Write a code that reads in this file and calculates the average high and low temperatures per month and adds up the precipitation to a total precipitation per month. Remember: don't use `numpy` here!

Output: Print the results into a nicely formatted table (pay attention to significant figures and have all columns aligned properly) on the screen and write the same table into a file. You don't have to submit this file with your source code.

1.2 Was 2015 a hot or a cold year?

Download the file `flagstaff_climate_monthly.dat` from the "assignments" directory on the `github` website. It contains the average high and low temperatures, as well as the average precipitation, measured for each month in Flagstaff over many years.

Read in the data stored in this file. For each month, calculate the residual between 2015 and the monthly average as provided by the file for the low/high temperatures and the precipitation. Also, what is the average residual per month for each of those quantities over the whole year? Was 2015 a hot/cold/wet/dry year?

Output: Print the residuals for each month and each quantity into a nicely formatted table. Also print the average residual over the whole year for each quantity.

If you want this assignment to count into your final grade, please submit it to `michael.mommert@nau.edu` before 29 Sept, 23:59!