Laboratory Exercise - 3 : Ploting in python

CE670a: Environmental Geodesy — Date: Jan 24,2018
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Objective:

1. learn basic command in pandas and matplotlib.
2. Matrix manipulation and scientific computation using numpy.

Task

1. parsing data- Read temperature data from http://berkeleyearth.org/data/.
   Data link- http://berkeleyearth.lbl.gov/auto/Global/Complete_TAVG_complete.txt

2. Read the data as pandas dataFrame.

3. Compute statistics i.e. mean, max , std deviation etc. for given data .

4. Plot time series with monthly anomaly data, annual anomaly data, both data in single subplot, 10year anomaly, 12 year anomaly etc. and visualize trend of data. (You can use matplotlib or seaborn)

5. Plot the above time series with their uncertainties with errorbar.
   (Ref. https://jakevdp.github.io/PythonDataScienceHandbook/04.03-errorbars.html)

6. Monthly mean is also given in the header of the dataset.
   a. Add the seasonal mean to the anomalies and plot the monthly data.
   b. Plot the seasonal mean as a bar graph.

7. Do a scatter plot of the kanpur time series with the global time series using monthly, annual data. How does the data density affect the graphic?

   Test your function on e(x) and cos(x) with a = 0 , b = 1.57.

8. Write a function called simpson which takes input parameters f(function f(x)) , a ,b (interval of integration) , N(number of subintervals) and returns the approximation Sn(x).Assign a default value N = 50.
   Test your function on e(x) and sin(x) with a = 0 , b = 1.57.

Notes

1. No marks will be given for late submission.

2. Zero marks will be provided to both parties for cribbing each other's work.

3. Last date of submission- 24 Jan.2020

4. You can download reference for pandas and matplot from below link

https://drive.google.com/open?id=1mUd8qWhzRMvM4s6M4Wd-nd7x5QmfcEaY