CS101
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Program Five - Algorithm

Sun Spot Prediction Algorithm

Summary:

Using provided sunspot data, remove the random noise to provide a smoothed data set for analysis of 11 year sunspot cycles. Graph the smoothed data to provide a visual representation of the sunspot activity for the period of time the data covers.

Algorithm:

1) Create a function that formats the raw data from dailysunspots.txt into monthly.txt:
    a. Open file
    b. With a for loop, read the txt file line-by-line
        i. If sunspot count is not 999:
            1. Split line into strings, retaining date and sunspot count
            2. Create dictionary full of each year/month's values (split on month value)
        ii. Average values from each dictionary month's dictionary
        iii. Formatted properly, write each month's (dictionary's) average to a line in a new file called monthly.txt
2) Create a function that "smooths" the data from monthly.txt:
    a. Open file
    b. With a for loop, read the txt file line-by-line
        i. Copy into dictionary of values
    c. For all values with six months before and after, calculate smoothed value: (.5 * first value + .5 * last value + sum of all other values)/ 12)
    d. Save each calculated, smoothed value into a line of new file called smooth.txt
3) Create a function that graphs the data from smooth.txt:
    a. Using pylab, graph the monthly data from smooth.txt