

Practice session 7

1) Plot a graph of the function $f(x) = x^2 + 20$, for integer values of x in the range 0-100. We can build the lists of x and y values with a for loop. Build the list of y values by starting with an empty list and appending values to it. Having created the lists of x and y values, plot the graph. Generate noise with the random module. The function is $f(x) = x^2 + 20 + R$, where R is the noise term, an integer between 0 and 1000. Plot the graph. The noise represents the observational error of the investigated system. Try to restore the noiseless system by applying a polynomial fit. Try to change the degree of the polynomial fit. Find the best fit.

2) Your supervisor is interested in solar physics, hence he asks you to create a fancy chart about the variation of the sunspot numbers between 1987 and 2014. He did not give you actual data but he recommended a website:

<http://www.sidc.be/silso/datafiles>.

Sunspot information: <https://en.wikipedia.org/wiki/Sunspot>

Use the CSV database (filename: SN_d_tot_V2.0.csv) Comma Separated values. The separator is the semicolon. Column 4 is the date in fraction of year. Column 5 is the daily total sunspot number. A value of -1 indicates that no number is available for that day (missing value). Ignore the other columns and the missing value.