

General course learning outcomes:

- demonstrate the use of basic programming techniques in the construction of computer programs, including inputting data from a file.
- apply programming techniques to solve problems in engineering.
- complete a team programming assignment that ties together concepts learned in the class.

## Activity 1: File Read and Write - to do in lab (team)

✓ Read data from a file

✓ Create a professional plots in Python

Continue working with last week's interpolation-extrapolation program. The second activity included the creation of an external file titled "nailedIt.txt" when the program is executed, based on the data points provided by the user. For this week's activity, we will create a new program that uses this data file.

- (Using the data file) The program will prompt the user for a data file to read (*for testing, use 'nailedIt.txt', but the user should have the option to select a different file*).
- Ask the user for a value to interpolate or extrapolate using the data from the data file. Read in the data from the file, and perform the necessary interpolation or extrapolation. You may reuse any code from last week's activities to do so.
  - Print out the calculated interpolated/extrapolated value to the user.
  - Using matplotlib, create a scatter plot of the data input from the user and point out the location of the value calculated on the plot (*with annotation*).

For example: your program will ask the user for a time, and then output the y-value at that time, either interpolated or extrapolated from the data read from the file. It will also create and display a scatter plot of the data provided from the file, and indicate on the plot the location of the calculated point with annotated text.

### Example plot for Activity 1

