MADE BY: YASMEN AHMED FADEL

ASS OF AI

TO ENG: AHMED KHALED

to prove the accuracy or confidence in a set of measurements or computed numbers. Without error bars, a measured or calculated number appears to be known with great precision or with high confidence. Because error bars display the confidence or precision in a collection of measurements or calculated values, they are helpful to problem solvers. Without error bars, a measured or calculated number appears to be known with great precision or with high confidence.

We'll use error bars to analyse the Coefficient of Thermal Expansion data from the previous section. The data is first stored in three NumPy arrays. The mean or average of each array is then calculated. The height of the bars in the bar plot will be determined by the mean of each array. The standard deviation of each array is then calculated. The standard deviation will be the height of the error bars. Finally, a couple of lists are generated to correspond to the bar labels (labels), bar positions (x pos), bar heights (CTEs), and error bar heights (error).

Error bars can also be added to line plots created with Matplotlib. The ax.errorbar() method is used to create a line plot with error bars. The two positional arguments supplied to ax.errorbar() are the lists or arrays of x, y data points. The two keyword arguments xerr= and yerr= define the error bar lengths in the x and y directions.

The general format of Matplotlib's ax.errorbar()

import numpy as np

import matplotlib.pyplot as plt

x = np.linspace(0,5.5,10)

y = 10\*np.exp(-x)

xerr = np.random.random\_sample(10)

yerr = np.random.random\_sample(10)

fig, ax = plt.subplots()

ax.errorbar(x, y,

            xerr=xerr,

            yerr=yerr,

            fmt='-o')

ax.set\_xlabel('x-axis')

ax.set\_ylabel('y-axis')

ax.set\_title('Line plot with error bars')

plt.show()

