Exercises for Day 10

Exercise 1. Plot $\cos(\theta)$ and $\cos^2(\theta)$ for θ from 0 to 360°:

- Use increments of 1° for θ.
- Both curves should be on the same figure.
- Use a black solid line for the $\cos(\theta)$ curve, and a black dashed line for the $\cos^2(\theta)$ curve. You may want to use `help plot` to figure out how to specify black lines.
- Add good axis labels, a title, and a legend to the plot.
- Add the command `axis([0 360 -1 1])` to the end of your script to set the x-axis limits to 0 and 360, and the y-axis limits from -1 to 1.
- Copy the figure and paste it into a Word document along with your code.

Exercise 2. Plot all of the thermocouple data from yesterday's class:

- Read in the data using `xlsread`.
- The data in the first column is 'Potential (volts)'. It is the data for the x-axis. Use a `for` loop to copy the data in the first column into a new vector.
- The data in the second column is 'Temperature (degrees F)'. It is the data for the y-axis. Use a `for` loop (it can be the same loop) to copy the data in the second column into a new vector.
- Now plot these two vectors and add their axis labels.
- Use a solid black line for the plot.
- Set the x-axis limits to 0 to 2.2 volts, and the y-axis limits to 0 to 300 degrees F.
- Add the figure title 'Thermocouple Data'.
- Copy the figure and paste it into a Word document along with your code.

Exercise 3. Plot selected points from the thermocouple data. We want to plot ONLY every 10th point in the original data:

- Save your script from Exercise 2 under a new name to start this Exercise.
- Adjust your vectors so that they only contain every 10th point in the original data; that is, keep the 1st point, the 11th point, the 21st point, etc.
- Plot the vectors using black circle symbols.
- Copy the figure and paste it into a Word document along with your code.

(over)

Exercise 4. Plot the following two mathematical functions on the same figure:

$$f_1(x) = \frac{x+4}{x^2+5}$$

$$f_2(x) = \frac{x+4}{x^2+5} e^{-0.1x} \sin(x)$$

- Use x from -5 to 5. Pick an increment small enough so that the functions look smooth.
- Use two different line types and a legend to differentiate the two functions being plotted.
- Give the plot good labels and a title.
- Copy the figure and paste it into a Word document along with your code.