Learning Objectives

1. **Create** scatter plots in MATLAB with good graphing conventions (e.g. legend, line styles, title, multiple plots on same graph).
2. **Create** plots using other 2D graphing options in MATLAB (e.g. log, subplot, fplot).
3. **Select** the proper opportunities to utilize aforementioned 2D graphing options.

Textbook Reading

Chapter 5.1 – 5.5 and 5.10 – 5.11

Topics

This lecture contains the following topics:

1. `plot()` command
2. `fplot()` command
3. Logarithmic Axes
4. Subplots and Multiple Figures

Outline

Below is an outline of the topics and the order in which they should be covered:

1. **plot() Command (Instructor’s In-class Activity)**
   a. `plot(x_vec, y_vec)` will generate a line where `x_vec` is the vector of `x`-values and `y_vec` is the vector of corresponding `y`-values. Vectors must be the same length.
   b. Line specifiers allow you to change the type of the line and markers on the plot.
      Refer to the book or type `help plot` for syntax and options.
   c. Multiple sets of data can be plotted together on the same plot.
   d. All plots must be formatted with a title, labeled, axes, and a legend if applicable. Use `plot` formatting commands to add these to plots.

2. **fplot() Command (Instructor’s In-class Activity)**
   a. The `fplot()` command lets you plot a function instead of using vectors of `x` and `y` values.
   b. Only one variable can be referenced in the function.
   c. The function must be entered as a string and limits are entered as a vector.

3. **Logarithmic Axes (Instructor’s In-class Activity)**
   a. Use different plot commands to plot curves with logarithmic scales:
      i. `loglog(x, y)` – Log scale on both axes
      ii. `semilogx(x, y)` – Log scale on x-axis and linear scale on y-axis
      iii. `semilogy(x, y)` – Log scale on y-axis and linear scale on x-axis
4. **Subplots and Multiple Figures (Instructor's In-class Activity)**
   a. Multiple plots can be organized in the same figure with the subplot() command (EX: subplot(rows, columns, plot #)).
   b. Specifies the location of the subsequent plot.
   c. Use before typing the plot command.
   d. Create new figure windows by typing figure(#) before typing the plot command.

5. **Students will complete Part 1 of the assignment to turn in by the end of class. Once finished, students may start on Part 2 due by the next class. Students will submit Part 1 of the assignment to the Carmen dropbox as a PDF.**