

MATLAB Tutorials

Work through all of the following tutorials. Understand and be able to implement everything in these tutorials.

<http://www.mathworks.com/help/matlab/getting-started-with-matlab.html>

Statement

I confirm that I understand and read through all of the introductory material at the above website. Further, I confirm that I understand the information and am able to apply the concepts that it taught.

Signature

MATLAB Practice

Problem #1 – Calculating and Plotting Functions

Use MATLAB to plot all three of the following functions on the same plot using a different color for each line. The figure must have a white background, lines should be of reasonable thickness, a legend should be included to identify the functions, enough points used to resolve the lines smoothly, and the axes must be labeled. **Do not use any for loops.**

$$\begin{aligned}f_1(x) &= \cos(x) \\f_2(x) &= \exp\left[-(x/2)^2\right] \quad -10 \leq x \leq 10 \\f_3(x) &= f_1(x)f_2(x)\end{aligned}$$

Problem #2 – Matrices

Use MATLAB to build the following matrix. Calculate and display its eigen-values and eigen-vectors. **Build the matrix using the function `diag()` and do not use any for loops.**

$$A = \begin{bmatrix} -2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & -2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & -2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & -2 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & -2 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & -2 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & -2 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & -2 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -2 \end{bmatrix}$$

Hint: `[V,D] = eig(A)`