ELEN 3381   Assignment #11

Due date: Shown on the Blackboard.

Use a reversed order of your student ID as 8 data points. For example, if your student ID is L20038533, then x = [1 2 3 4 5 6 7 8]; y = [2 0 0 3 8 5 3 3];.

Part 1: Find interpolations (nearest neighbor, piecewise linear, and cubic spline) for your number.

Plot the data as well as the interpolation lines (3 of them).

Please submit:

1. MATLAB code and three screenshots .   (3 pts)

Part 2: Find the area (numerical integration) for your student ID by using the trapezoid rule (Show your hand calculation and verify the answer with MATLAB result). Assume data points are connected by piecewise-linear interpolation.

Trapezoid integration function for MATLAB: trapz,

Please submit:

2. Hand calculation of your numerical integration using trapezoid rule. Verify your answer with the result from 3.a   (3 pts)

3. MATLAB code and the screenshot.
    a. Integration using 8 data points only, without interpolation.
    b. Integration using nearest-neighbor interpolation.
    c. Integration using piecewise-linear interpolation.
    d. Integration using spline interpolation.   (3 pts)

4. Explain what causes the calculated integration using the spline interpolation to be much different from results from other methods. If all integration values are very similar to each other using your student ID, try the example data points (20038533)   (1 pt)