Homework 11

MATH 5610 FALL 2016

NAME: GRADE:_____

Problem 1. Implement a self-contained piece of computer code that will compute the divided difference table for a function or a set of data points. Try the code out on the following functions. Use equally spaced points on the interval with $n = 4, 8, 16, 32$

a. $f(t) = 3 \cdot t^2 - 2 \cdot t^3 \quad t \in [-1, 2]$,

b. $f(x) = sin(\pi \cdot x), \quad x \in [0, 3]$,

Problem 2. Implement a code that uses the appropriate entries in a divided difference table to define an array of real numbers for the coefficients of the Newton form of the interpolating polynomial for a given function. Use the functions in Problem 1 to verify that your code works. Plot the interpolating function against the actual function to see your results. Use equally spaced points as in Problem 1.

Problem 3. Repeat the work in Problem 2 using randomly spaced points in the given interval. Graph the results for various sets of nodes when $n = 16$.
