

CSC 2262 Homework Assignment 3

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50 points Due: 3/16/09 in class

1: Interpolation and Approximation (30 points)

Consider the function $f(x) = e^{-x^2}$. Now, consider approximating this function using interpolating polynomial. Choose $x = -4 : 4$. These are nine points and hence will result in degree 8 polynomial. Plot this polynomial $P_8(x)$ and compare it against the plot of $f(x)$. What is an error at point $x = 2.5$? Now, repeat this for $f(x) = \cos x$. Explain the difference in two errors using the error formula (4.54).

2: Programming (20 points)

Given points $(x_0, y_0), (x_1, y_1), \dots, (x_n, y_n)$ and derivatives at each of these points y'_0, y'_1, \dots, y'_n : Write a program to find the interpolating polynomial (of degree $2n+1$), and to evaluate it on given points x_{eval} .