

AER 336S: Assignment 1

1. Write a computer program (Matlab is fine – include the code with your assignment submission) to construct a polynomial interpolant with uniform spacing using Lagrange polynomials. Apply it to the following function on the domain $[-1, 1]$:

$$f(x) = \frac{1}{1 + 25x^2}$$

Plot your result with 10 and 20 equal intervals ($n = 11, 21$).

2. Using the approach presented in class, write a computer program to develop a *natural* cubic spline. Apply to the following function on the domain $[-1, 1]$:

$$f(x) = \frac{1}{1 + 25x^2}$$

Plot your result with 10 and 20 equal intervals ($n = 11, 21$). Find the location of maximum error and examine the behaviour of the maximum error as the number of intervals is increased by considering at least five different values.