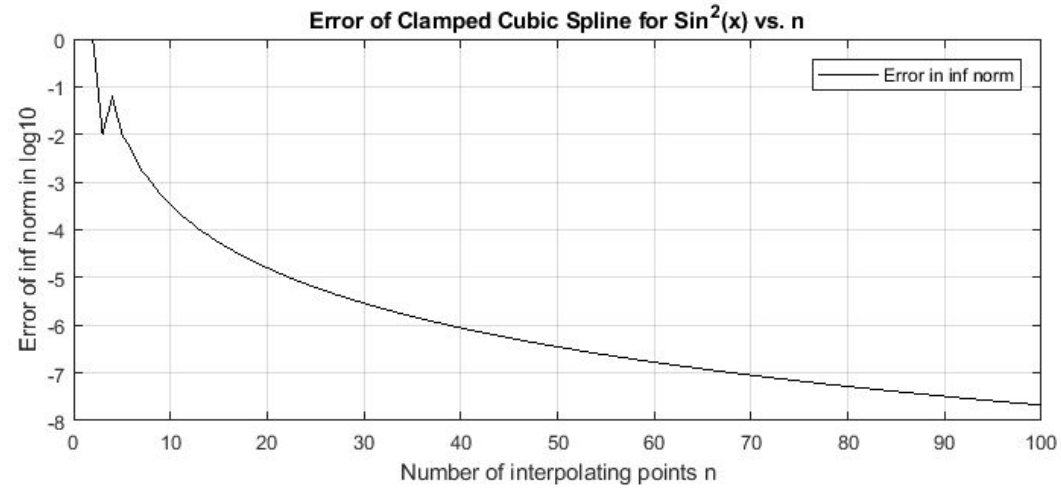

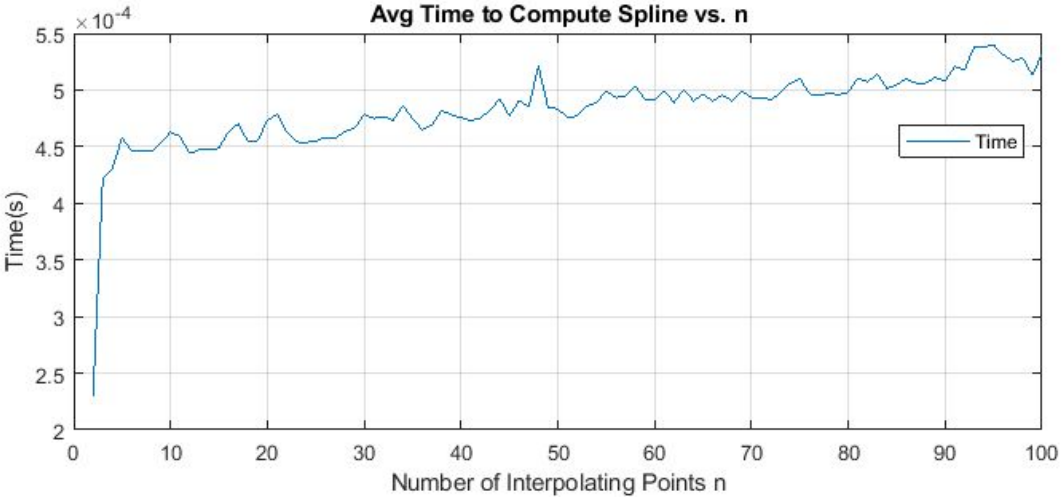

The cubic spline system can be reduced to Ax = b, where x is a column vector containing the S''(Xn)/2. The system is tridiagonal, and can be solved by the Thomas algorithm, which requires O(n) steps.

The graph of average time to compute a spline vs. n interpolating points is linearly proportional to the number of interpolating points (Disregarding n = 2, which is interpolated as a straight line).

I expect the error to be bound by the given formula (5/384)*M*(h^4). Since our nodes are equally spaced from 0 to pi, h = pi/(n-1).

Analytically, M is the absolute value of the maximum of the fourth derivative of sin^2(x) over the interval 0 to pi. The fourth derivative is -8cos(2x) and the maximum is 8.

Comparing the computed error and the error bound formula, the error is confirmed to be less than the bound at each number of interpolating points.