Prelab:

Solving for A:

I would invert the Vandermonde matrix, being left with the equation: $A = V^{-1}b$. V contains information about each of the interpolation points it seems (each row has a different x-value). So, if you solve for A, it seems like you have solved p at each of the interpolation points.

Summary of the remainder of the lab:

We're creating the interpolation of a function using a function for each interpolation point using the methods: monomial expansion, Lagrange polynomials, Newton divided differences. We will study the error in the approximation of each method.

Next, we're improving the approximation by controlling what we can control: (x-x0)...(x-xn) by adding more nodes near the end of the interval. Using this, we will repeat the previous methods used and see the new error.

Lab:

3.1.2.

Monomial expansion seems to do the worst since its error plot is quite large in the middle compared to the others. Lagrange and NDD seem to perform similarly. However, I think Newton Divided Differences does perform the best.

3.1.3.

I ran N = 18 and it happens with all the methods that the interpolation goes crazy at the beginning and at the end.

3.2.2.

The interpolation doesn’t go crazy at the endpoints anymore.

3.2.3.

The error rises in the middle and falls off at the ends now instead of the reverse as in 3.1.