

Pre-lab 7

- Solve for coefficient $\{a_j\}_{j=0}^n$ with Vandermonde

$$\begin{bmatrix} 1 & x_0 & x_0^2 & \dots & x_0^n \\ 1 & x_1 & x_1^2 & \dots & x_1^n \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & x_n & x_n^2 & \dots & x_n^n \end{bmatrix} \begin{bmatrix} a_0 \\ a_1 \\ \vdots \\ a_n \end{bmatrix} = \begin{bmatrix} y_0 \\ y_1 \\ \vdots \\ y_n \end{bmatrix}$$

$$V \rightarrow \Rightarrow \underline{a} = V^{-1} \cdot \underline{y}$$

So now I just need to get \underline{y} from inserting \underline{x} into $f(x_j)$.

- Find how many degrees
- Get that many x_j points spaced between $[a, b]$
- Get the corresponding y_j from $f(x)$
- Use the Vandermonde inverse to get a_j

3.1: Using the codes from class evaluate the difference in performance of the different methods by changing the degree of the polynomial.

3.2: Repeat 3.1 but changing where and how the x_j points are spaced