Pre lab 7

This is a plan for writing the code:

1. **Construct the Vandermonde matrix:** Write a function that takes the interpolation points ($x_0, x_1, ..., x_n$) and constructs the Vandermonde matrix.

$$
\begin{bmatrix}
1 & x_0 & x_0^2 & \cdots & x_0^n \\
1 & x_1 & x_1^2 & \cdots & x_0^n \\
\vdots & \vdots & \vdots & \cdots & \vdots \\
1 & x_n & x_n^2 & \cdots & x_n^n
\end{bmatrix}
$$

2. **Solve the linear system:** Write a function that takes the Vandermonde matrix and the function values ($f(x_0), f(x_1), ..., f(x_n)$) and solves the linear system to find the coefficients ($a_0, a_1, ..., a_n$) by using *np.linalg.solve*

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

3. **Evaluate the polynomial:** Once you have the coefficients, write a function that takes the coefficients and an input value (x) and evaluates the polynomial ($p_n(x)$) using the coefficients.