

Small project

1. Find the interpolating polynomial, $p_n(x)$, for the Runge's function $f(x) = \frac{1}{1+25x^2}$ on the interval $x \in [-1, 1]$ by solving a linear problem with the transpose of the Vandermonde matrix. Take an equidistant grid with several values of $n \geq 7$. Plot the error $e(x) = f(x) - p_n(x)$. Comment on the results.

2. Find the interpolating polynomial, $p_n(x)$, and plot it, for the US Census data (use Matlab command `load census` and `[cdate,pop]` to display it). Also compute the extrapolated value for the year 2000 and compare it with the actual data.