

Chapter 3 Interpolation and Polynomial Approximation

A census of the population of US is taken every 10 years

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|------------------------------|---------|---------|---------|---------|---------|---------|
| Year | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 |
| Population (in thousands) | 132,165 | 151,326 | 179,323 | 203,302 | 226,592 | 249,633 |

If we want to know the population in 1965 or 2010 we have to fit a function through the given data.

Def: The process of fitting a function through given data is called interpolation.

The most usual type of functions fitted through data are polynomials.

Def: The process of fitting a polynomial through given data is called polynomial interpolation

$$P_n(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$$