

Overview of Statistics

Statistics is a scientific discipline that provides methods to help us make sense of data. For our purposes, Statistics is comprised of the following components:

1. Conducting studies and collecting data.
2. Summarizing and analyzing data in order to extract the maximum amount of information from data.
3. Drawing conclusions and making decisions based on data.

Time series analysis is a statistical method used to accomplish the above when data are collected over time and hence are correlated.

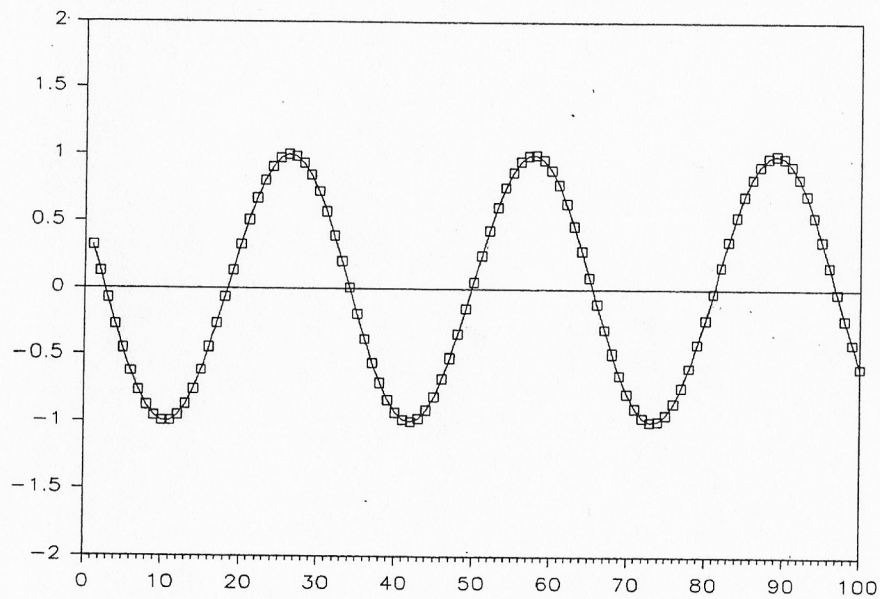


Figure 1.1. 100 observations of the series $x(t) = \cos(.2t + \pi/3)$.

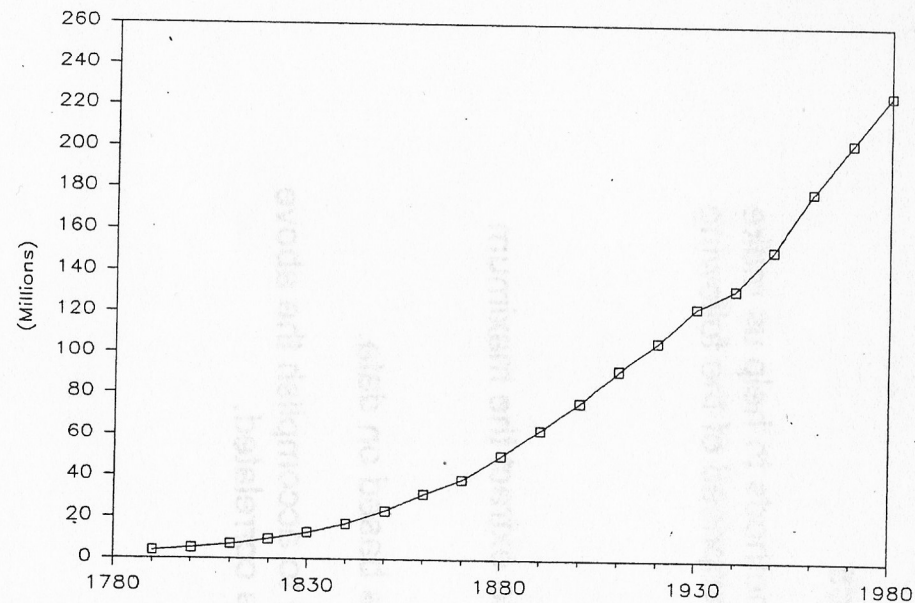


Figure 1.2. Population of the U.S.A. at ten-year intervals, 1790–1980 (U.S. Bureau of the Census).

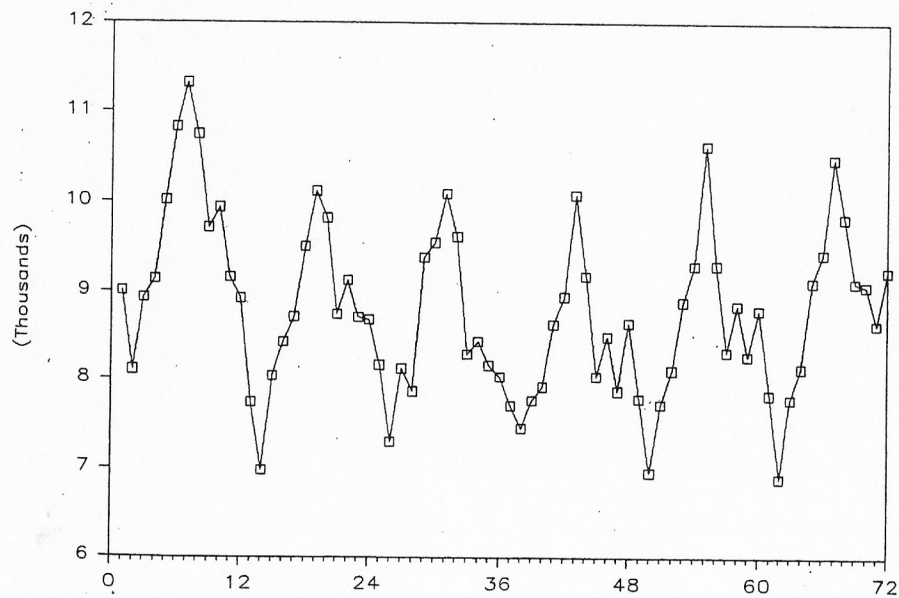


Figure 1.6. Monthly accidental deaths in the U.S.A., 1973–1978 (National Safety Council).

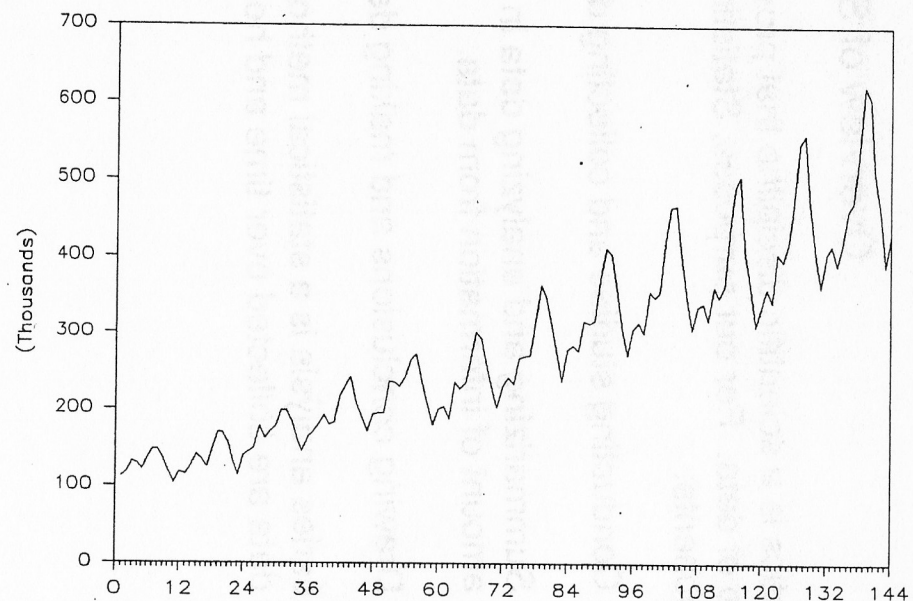


Figure 9.7. International airline passengers; monthly totals in thousands of passengers $\{U_t, t = 1, \dots, 144\}$ from January 1949 to December 1960 (Box and Jenkins (1970)).

Source: Brockwell and Davis