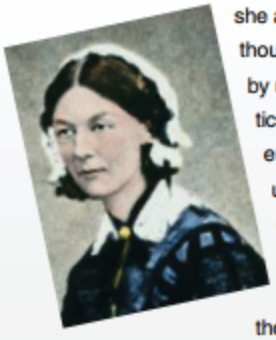
Florence Nightingale

Florence Nightingale (1820–1910) is known to many as the founder of the nursing profession, but she also saved thousands of lives by using statistics. When she encountered an unsanitary and undersupplied hospital, she improved those conditions and then used statistics to convince others of the need for more widespread medical reform. She developed original graphs to illustrate that during the Crimean War, more soldiers died as a result of unsanitary conditions than were killed in combat. Florence Nightingale pioneered the use of social statistics as well as graphics techniques.



Example 3 Clusters and a Gap

Consider the scatterplot in Figure 2-8. It consists of paired data consisting of the weight (grams) and year of manufacture for each of 72 pennies. This scatterplot shows two very distinct clusters separated by a gap, which can be explained by the inclusion of two different populations: pre-1983 pennies are 97% copper and 3% zinc, whereas post-1983 pennies are 3% copper and 97% zinc. If we ignored the characteristic of the clusters, we might incorrectly think that there is a relationship between the weight of a penny and the year it was made. If we examine the two groups separately, we see that there does *not* appear to be a relationship between the weights of pennies and the years in which they were produced.

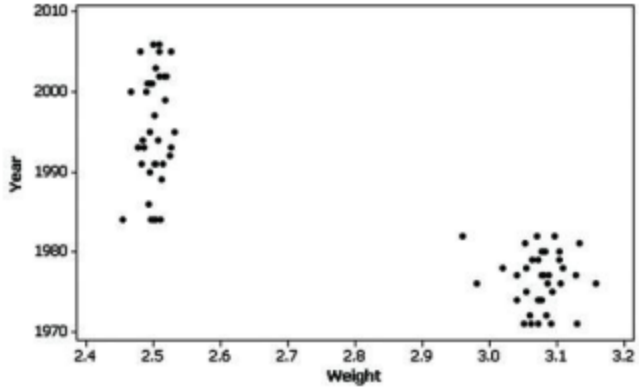


Figure 2-8 Weights (g) of Pennies and Years of Production

Time-Series Graph

A **time-series graph** is a graph of *time-series data,* which are quantitative data that have been collected at different points in time, such as monthly or yearly.

Example 4 Time-Series Graph: Dow Jones Industrial Average

The time-series graph shown in Figure 2-9 depicts the yearly high values of the Dow Jones Industrial Average (DJIA) for the New York Stock Exchange. This graph shows a fairly consistent pattern of increases from 1980 to 1999, but the DJIA high values have been much more erratic in recent years.

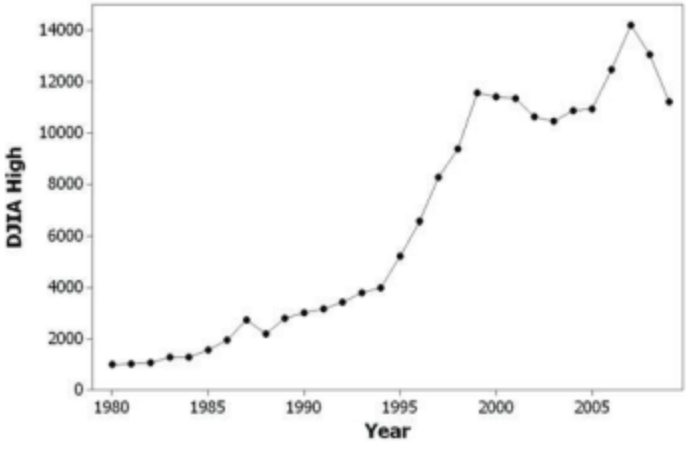


Figure 2-9 Dow Jones Industrial Average