

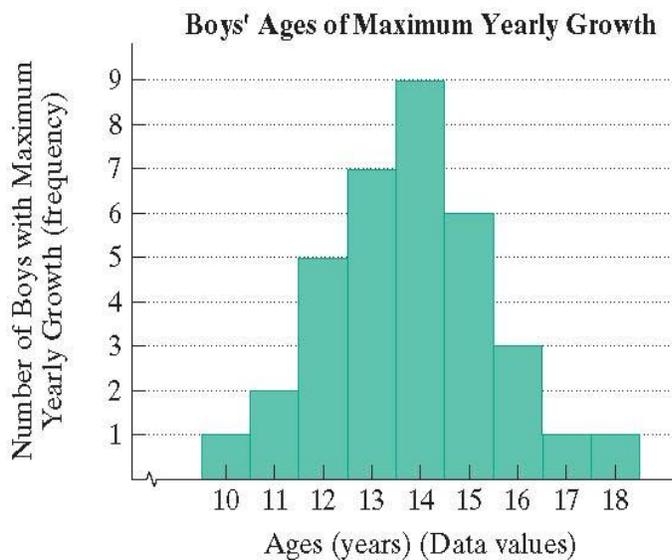
Statistics: Method of collecting, organizing, analyzing, and interpreting data, as well as drawing conclusions based on the data. Methodology is divided into two main areas: Descriptive Statistics and Inferential Statistics. In MGF 1106 we study a brief intro to descriptive statistics.

Definitions: population, sample, Representative Sample.

A **random sample** is a sample obtained in such a way that every element in the population has an equal chance of being selected. Methodology: Identify each element in the population, assign numbers to each element in the population, randomly select numbers, assign the elements in the population who have those numbers to the sample set.

Frequency distribution. Example.

Histogram: A bar graph with bars that touch can be used to visually display the data.



Stem-and-Leaf Plots: example.

Visual Displays of Data. Misleading charts.

Measures of Central Tendency

Mean: The sum of the data items divided by the number of items.

Calculating the Mean for a Frequency Distribution: example

$$\text{Mean} = \bar{x} = \frac{\sum xf}{n},$$

Median is the data item in the middle of each set of ranked, or ordered, data.

Mode is the data value that occurs most often in a data set. If more than one data value has the highest frequency, then each of these data values is a mode. If no data items are repeated, then the data set has no mode.

Midrange is found by adding the lowest and highest data values and dividing the sum by 2.

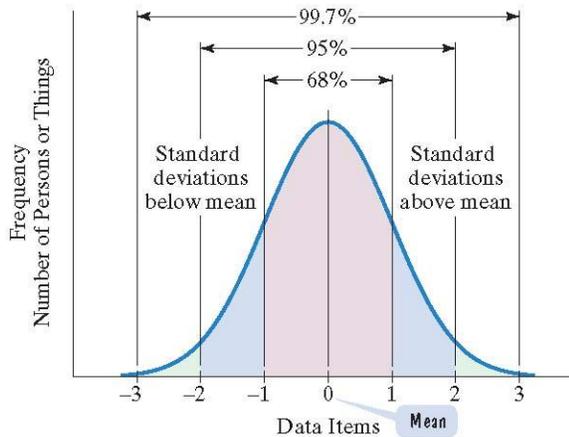
Measures of Dispersion

Range: The difference between the highest and the lowest data values in a data set

Standard deviation:

$$\sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

The Normal Distribution: Standard Deviation and the 68-95-99.7 Rule



Computing Z-Scores. Example.

Ex. Intelligence quotients (IQs) on the Stanford–Binet intelligence test are normally distributed with a mean of 100 and a standard deviation of 16. What is the IQ corresponding to a z-score of -1.5 ?

Ex. According to the Department of Health and Education, cholesterol levels are normally distributed. For men between 18 and 24 years, the mean is 178.1 and the standard deviation is 40.7. What percentage of men in this age range have a cholesterol level less than 239.15?

Ex. The amount of time that self-employed Americans work each week is normally distributed with a mean of 44.6 hours and a standard deviation of 14.4 hours. What percentage of self-employed individuals in the United States work between 37.4 and 80.6 hours per week?