

Statistical Definitions

In each definition, x_i are the individual measurements and N is the number of measured values.

mean:

$$\bar{x} = \frac{1}{N} \sum_{i=1}^N x_i = \frac{1}{N} (x_1 + x_2 + \dots + x_N)$$

deviation:

$$d_i = (x_i - \bar{x})$$

average deviation or dispersion:

$$\bar{d} = \frac{1}{N} \sum_{i=1}^N |d_i| = \frac{1}{N} \sum_{i=1}^N |(x_i - \bar{x})|$$

variance:

$$(\sigma_x)^2 = \frac{1}{N-1} \sum_{i=1}^N (d_i)^2 = \frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2$$

standard deviation:

$$\sigma_x = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (d_i)^2} = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

standard deviation of the mean:

$$\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{N}}$$