**variance** ($\sigma^2$, $s^2$, $var(X)$)
A measure of *dispersion* that is equal to the mean squared distance of a set of *data points* from their *mean*:

$$\sigma^2 = \frac{1}{n}\sum(X-\mu)^2$$

Distances are squared so that positive and negative values cannot cancel out each other. For example, the variance of the data set

$$x = \{1,2,3,4,5,6\}$$

with mean $\mu = 3.5$ equals

$$\frac{(1-3.5)^2+\cdots+(6-3.5)^2}{6} = 2.91\bar{6}$$

The notation $\sigma^2$ indicates the *population* variance, while $s^2$ denotes the *sample* variance. The sample variance is defined as:

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

where the use of the factor of $\frac{1}{n-1}$ instead of $\frac{1}{n}$ is known as *Bessel's correction*. A more intuitive measure of dispersion is the *standard deviation*. *Probability distributions* have closed forms for computing their variance.