Variance and Standard Deviation

Variance

Variance is a measure of spread that takes all values into account. Variance by definition, is the **average squared distance from the mean**.

To calculate variance, use the equation:

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

Where $\bar{x}$ is the mean
and n is the number of data items
and $\sum x^2$ is the sum of the square of each data item.

This can be rearranged into the form:

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

or

$\frac{\sum x^2 - n\bar{x}}{n}$

Standard Deviation

Standard deviation is just the square root of the variance. Thus, when given the variance, the S.D. is just its square root, and vice versa.