Standard Deviation

Measures how much dispersed the data is in relation to the mean.

$$\sigma = \sqrt{\frac{\sum(x_i - \mu_x)^2}{N}}$$

Where:

- **Xi** – a point X.
- **μX** – the mean of X.

Calculating Standard Deviation

Standard deviation is calculated as follows:

1. Calculate the Mean of all data points.
2. Calculate the Variance for each data point.
3. Square the variance of each data point (from Step 2).
4. Sum of squared variance values (from Step 3).
5. Divide the sum of squared variance values (from Step 4) by the number of data points in the data set less 1.
6. Take the square root of the quotient (from Step 5).

> **Hint**
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> Why?
>
> We are taking the average of the distances from the mean for each point.
> But, we square the distances so that they are always positive, then we sqrt everything to get the correct unit of measurament.
>
> I'm positive that this is correct, tho I'm not 100% sure.