* Measures of Dispersion:

Range = largest value - smallest value.

Standard deviation: How far away the average value is from the mean.

\[ x_i - \mu = E(x_i - \mu) = 0 \]

\[ \begin{align*}
&x_i - \mu < 0 \\
&x_i - \mu > 0
\end{align*} \]

\[ \sigma = \sqrt{\frac{\sum (x_i - \mu)^2}{N}} \]

\[ \sigma \] = population standard deviation

\[ \sigma \] = sample standard deviation

\[ s = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \ldots + (x_n - \bar{x})^2}{n-1}} \]

\[ s \] = sample standard deviation

\[ \bar{x} \] = sample mean

The more spread out the data set is, the higher the standard deviation will be.

* Variance: \( \sigma^2 \)