



Correlation Coefficients

Correlation coefficients provide a measure of the **strength** and **direction** of a **linear** relationship.

We can tell the direction based on whether the correlation is positive or negative.

A rule of thumb for judging the strength:

**Strong**

$$0.7 \leq |r| \leq 1.0$$

Moderate

$$0.3 \leq |r| < 0.7$$

Weak

$$0.0 \leq |r| < 0.3$$

Calculation of the Correlation Coefficient

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2} \sqrt{\sum (y_i - \bar{y})^2}}$$

It can also be calculated in Excel and other spreadsheet applications using **CORREL(col1, col2)**, where **col1** and **col2** are the two columns you are looking to compare to one another.

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