

Correlation and Regression Formulae

Product Moment Correlation coefficient

$$r = \frac{S_{xy}}{\sqrt{S_{xx} \times S_{yy}}} = \frac{\sum x_i y_i - \frac{(\sum x_i)(\sum y_i)}{n}}{\sqrt{\left(\sum x_i^2 - \frac{(\sum x_i)^2}{n}\right) \left(\sum y_i^2 - \frac{(\sum y_i)^2}{n}\right)}}$$

Equation for line of best fit

$$y = a + bx$$

$$a = \bar{y} - b\bar{x}$$

$$b = \frac{S_{xy}}{S_{xx}} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sum (x_i - \bar{x})^2}$$

Spearman's Rank Correlation Coefficient

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$