Correlation Coefficient & Regression Formulas

Pearson's Correlation Coefficient

$$r=rac{n arSigma xy - arSigma x arSigma y}{\sqrt{[n arSigma x^2 - (arSigma x)^2][n arSigma y^2 - (arSigma y)^2]}}$$

&

$$r=rac{\Sigma(x-ar{x})(y-ar{y})}{\sqrt{\Sigma(x-ar{x})^2(y-ar{y})^2}}$$

Spearman Rank correlation coefficient

$$egin{aligned} r = 1 - rac{6 arSigma di^2}{n(n^2-1)} \ di = R_x - R_y \end{aligned}$$

 R_x is Rank Of X While R_y is Rank of Y

Regression Formula

$$egin{aligned} y &= a + bx \ b &= rac{n arSigma xy - arSigma x arSigma y}{n arSigma x^2 - (arSigma x)^2} \ a &= ar{y} - bar{x} \end{aligned}$$

I love σ^2

Standard Error of Mean

$$SEM = rac{StadardDeviation}{\sqrt{n}}$$

Standard Deviation Formulas

$$SD = \sqrt{rac{\Sigma x - rac{(\Sigma x)^2}{n}}{n-1}}$$

&

$$SD = \sqrt{rac{\varSigma(X - ar{x})^2}{n-1}}$$