REGRESSION & CORRELATION FORMULAS (TEST 1)

$$SS(X) = \sum (x_i - \bar{x})^2 = \sum x_i^2 - \frac{\left(\sum x_i\right)^2}{n}$$

$$SS(Y) = \sum (y_i - \bar{y})^2 = \sum y_i^2 - \frac{\left(\sum y_i\right)^2}{n}$$

$$SS(xy) = \sum (x_i - \bar{x})(y_i - \bar{y})$$

$$= \sum x_i y_i - \frac{(\sum x_i)(\sum y_i)}{n}$$

$$\hat{y} = b_0 + b_1 x \qquad b_1 = \frac{SS(xy)}{SS(x)}$$

$$b_0 = \bar{y} - b_1 \bar{x}$$

$$r = \frac{SS(xy)}{\sqrt{SS(y)\,SS(x)}}$$

$$SS(E) = \sum (y_i - \hat{y}_i)^2$$

$$SS(R) = \sum (\hat{y}_i - \bar{y})^2 = \frac{(SS(xy))^2}{SS(x)}$$