GLM1 reference table

	Notation	Definition	Formula
Mean	$\bar{Y}$	The average of the numbers	$\frac{\sum x}{n} = \frac{Sum}{sample\ size}$
Individual value	y_i		
Deviation		A measure of difference between the observed value of a variable and the mean	$(x_i - \bar{x})^2$= the difference between the individual value and the mean
Degree of freedom	df	The maximum number of logically independent values, which are values that have the freedom to vary, in the data sample	n - 1
Variance	σ^2 / S^2	A measure of how spread-out numbers are	$\frac{\sum(x_i - \bar{x})^2}{n-1} = \frac{square\ of\ deviation}{degree\ of\ freedom}$
Total Sum of Squares	SSET, SST	Squared differences between the observed dependent variables and its mean	$\sum(Y_i - \bar{Y})^2$ = sum of squared deviation
Standard Deviation	σ / S	A measure of the amount of variation or dispersion of a set of values	$\sqrt{\frac{\sum(x_i - \bar{\bar{x}})^2}{n-1}} = \sqrt{variance}$ = $\frac{total\ sum\ of\ squares}{degree\ of\ freedom}$
Standard Error	SE	The standard deviation of its sampling distribution or an estimate of that standard deviation	$\frac{\sigma}{\sqrt{n}} = \frac{Standard\ deviation}{sample\ size}$
Predicted value	$\hat{Y}$		

Sum of squares error	SSEA, SSE	Difference between the observed value and the predicted value	$\sum(y_i - \hat{y})^2$
Reduced error	SSER, SSR	The sum of the differences between the predicted value and the mean of the dependent variable	**SST-SSE_A**
Proportional reduction in Error	PRE or R^2	The ratio of reduced error (SSR) to initial total error (SST)	**SSR/SST**
Regression coefficient	b_1		1. Conceptual formula $\frac{\sum(x_i-\bar{x})(y_i-\bar{y})}{\sum(x_i-\bar{x})^2}$ $=\frac{sum\ of\ (x\ deviation * ydeviation)}{sum\ of\ squared\ x\ deviation}$ 2. Computational formula $\frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sum X^2 - \frac{(\sum x)^2}{n}}$
Regression intercept	b_0		$\bar{Y} - b_1\bar{X}$
Pearson's r correlation coefficient	r		$\frac{\sum(X-\bar{X})(Y-\bar{Y})}{\sqrt{((X-\bar{X})^2\sqrt{(Y-\bar{Y})^2}}} =$ $\frac{\sum XY - \frac{\sum X \sum Y}{n}}{\sqrt{\sum X^2 - \frac{(\sum X)^2}{N}}\sqrt{\sum Y^2 - \frac{(\sum Y)^2}{N}}} =$ $\frac{SS_{XY}}{\sqrt{SS_X SS_Y}}$

T-Test statistics	t		$\frac{\overline{Y_1} - \overline{Y_2}}{S^2_{pooled}}$ where $S^2_{pooled} = \sqrt{\frac{(N_1 - 1)S^2{}_1 + (N_1 - 1)S^2{}_1}{N_1 + N_2 - 2}(\frac{1}{N_1} + \frac{1}{N_2})}$
F test statistics	F_{obt}		$\frac{Between-groups\ variability}{Within-groups\ variability} = \frac{MS_{BG}}{MS_E} = \frac{SSB/df}{SSW/df}$
Degrees of freedom between groups	df_{BG}		k-1 where k = number of levels/groups/conditions
Degrees of freedom within groups	df_E		N-k
Sum of degrees of freedom	df_{Tot}		N-1
Proportion of variability in Y explained by X	SSB		$[\frac{(\sum Y_{Group1})^2}{N_{Group1}}]+[\frac{(\sum Y_{Group2})^2}{N_{Group2}}] - \frac{(\sum Y)^2}{N_{Total}}$
Proportion of variability in Y unexplained by X	SSW		$\sum Y^2 - [\frac{(\sum Y_{Group1})^2}{N_{Group1}}]+[\frac{(\sum Y_{Group2})^2}{N_{Group2}}]$