Descriptive Statistics:

Quartiles:	Mean/Mode/Median:	Variance/Standard deviation:
$Q_1 = \frac{1}{4}(n+1)$ $Q_3 = \frac{3}{4}(n+1)$ $Q_2 = Q_3 - Q_1$	$n = number\ of\ terms$ $Mean(\bar{x}) = \frac{\sum x}{n}$ $Median(M_e) = \left(\frac{n+1}{2}\right)$ $Mode = The\ most\ frequent\ number$	$M = mean$ $Var(V) = \frac{\sum_{i=1}^{n}(x_i - M)^2}{n}$ $SD(\sigma) = \sqrt{Var}$

Bivariate Statistics:

Pearson coefficient correlation:

$r = \frac{SS_{(xy)}}{\sqrt{SS_{(x)}SS_{(y)}}}$	$r = \frac{Cov(x,y)}{S_x S_y} = \frac{\sum(x-\bar{x})(y-\bar{y})}{nS_xS_y}$, $-1 \le r \le 1$	$SS_{(x)} = \sum(x^2) - \frac{(\sum x)^2}{n}$ = n(Var(x)) $SS_{(y)} = \sum(y^2) - \frac{(\sum y)^2}{n}$ = n(Var(y)) $SS_{(xy)} = \sum(xy) - \frac{\sum x \sum y}{n}$ = n(Cov(xy))

Linear Regression:

$\hat{y} = b_0 + b_1 x$ $\hat{y} = Predicted\ value$	$b_1 = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sum(x-\bar{x})^2} = \frac{SS_{(XY)}}{SS_{(x)}}$	$b_0 = \frac{\sum y - (b_1 \sum x)}{n} = \bar{y} - (b_1\bar{x})$ $\bar{y}, \bar{x} = the\ x\ \&\ y\ values\ for\ the\ mean\ point\ of\ x\&y.$ $(independent\ variable, dependent\ variable)$

Probability:

Ω = The set of all possible outcomes, $|A|$ = number of elements in the set A.

A = The set of a specific event $\overline{A}$ (A^c)= The set of all events except event A. $A \cup B$ = Union of sets A and B. $A \cap B$ = Intersection of sets A and B. $\frac{A}{B} = A \cap \overline{B}$	P(A) = The probability of event A happening. $P(\overline{A}) = 1 - P(A)$ $P(\emptyset) = 0$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P\left(\frac{A}{B}\right) = \frac{P(A \cap B)}{P(A)}$ $P(A \cap B) = P(A)XP(B)$

Mutually exclusive events:	More than 2 events:
$P(A \cap B) = P(A)P(B)$ $P(A \cup B) = P(A) + P(B) - P(A)P(B)$	$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(C \cap B) + P(A \cap B \cap C)$ $P(A \cup B \cup C) = P(A \cup (B \cup C))$

De Morgan's Law:

$$\overline{A \cup B} = \bar{A} \cap \bar{B}$$

Distributivity:

$$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$$

Associativity:

$A \cup (B \cup C) = (A \cup B) \cup C = A \cup B \cup C$	$A \cap (B \cap C) = (A \cap B) \cap C = A \cap B \cap C$

Commutativity:

$A \cup B = B \cup A$	$A \cap B = B \cap A$