Formulas for Quiz #1

$$\bar{x} = \sum_{i=1}^{n} \frac{x_i}{n} \qquad \mu_x = \sum_{i=1}^{N} \frac{x_i}{N}$$

$$MAD = \frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}$$

$$s^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1} \qquad \sigma^2 = \frac{\sum_{i=1}^{N} (x_i - \mu)^2}{N} \qquad s = \sqrt{s^2} \qquad \sigma = \sqrt{\sigma^2}$$

Tchebysheff's theorem

At least $(1 - 1/k^2)$ of the observations lie within k standard deviations of the mean for a given # k

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[illegible] of variation

$$= \frac{s}{\bar{x}} \cdot 100$$

[illegible] $= \frac{x - \bar{x}}{s}$

$$P_r^n = \frac{n!}{(n-r)!} \qquad n^r \qquad C_r^n = \frac{n!}{r!(n-r)!}$$

[illegible] $= P(A) + P(B) - P(A \cap B)$

[illegible] exclusive

[illegible] $= 1$

[illegible] $= \frac{P(A \cap B)}{P(B)}$

[illegible]dence

[illegible] $P(B|A) \quad P(B)\,P(A|B)$

[illegible]

[illegible] $\cdot P(B)$

Bayes' Rule

$$P(S_i|A) = \frac{P(S_i)\,P(A|S_i)}{\sum_{j=1}^{k} P(S_j)\,P(A|S_j)}$$

k = # of possible mutually exclusive outcomes

x = random variable

$$E(x) = \mu_x = \sum_x x \times P(x)$$

$$\sigma^2 = E[(x-\mu)]^2 = \sum_x (x-\mu)^2 P(x)$$