Presents

The High Stakes World of Statistics (Part 3)

I. Probability Distributions for Continuous Random Variables
  A. Normal Probability Distribution
    1. review of histograms
    2. review of distribution curves
    3. mean of a normal distribution
    4. standard deviation of a normal distribution
    5. z-score & the empirical rule
  B. Uniform Distribution
    1. f(x) vs. p(x)
    2. mean of a uniform distribution
    3. standard deviation of a uniform distribution

II. Sampling Distributions & Sampling
  A. Sampling Distributions
    1. testing reliability
    2. mean of a sampling distribution
    3. central limit theorem
    4. standard error of the mean
      a. standard error of the mean as an indicator of reliability
  B. Large Samples
    1. estimators
      a. point estimators
      b. interval estimators
    2. confidence intervals
      a. confidence coefficient
      b. error of estimation
      c. lower limit
      d. upper limit
    3. hypothesis testing
      a. null hypothesis
      b. alternate hypothesis
      c. level of significance
        i. critical value
      d. test statistic
        i. z
        ii. t
      e. acceptance region
      f. rejection region
        i. one/two tailed tests
      g. Type I error
      h. Type II error
  C. Small Samples
    1. t distribution
    2. degrees of freedom

Formulas

Mean of a Normal Distribution ( )

$$= \frac{\_x}{n}$$

Variance for a Normal Distribution (^{2})

$$^2 = \frac{(x-)^2}{n}$$

Standard Deviation for a Normal Distribution ( )

$$= \sqrt{\ ^2}$$

Z-Score (Z)

$$Z = \frac{x-}{\sqrt{n}}$$

Mean of a Uniform Distribution ( )

$$= \frac{(a+b)}{2}$$

Standard Deviation for a Uniform Distribution ( )

$$= \frac{(b-a)}{\sqrt{12}}$$

Mean of a Sampling Distribution ($_{\bar{x}}$)

$$_{\bar{x}} = \frac{\_x}{n}$$

Variance of a Sampling Distribution ($_{\bar{x}}^2$)

$$_{\bar{x}}^2 = \frac{(x-)^2}{n-1}$$

Standard Deviation for a Sampling Distribution (Standard Error of the Mean) ($_{\bar{x}}$)

$$_{\bar{x}} = \sqrt{\ _{x}^{2}}$$

Error of Estimation

$$\text{E of E} = (Z)\frac{s}{\sqrt{n}}$$

To Form a Confidence Interval

upper limit= mean + error of estimation

lower limit= mean - error of estimation

Level of Significance ( )

$$= \underline{100 - \%\ \text{confidence}}$$

Z-score for a Hypothesis Test

$$Z = \frac{x - \qquad\qquad 100}{\sqrt{n}}$$

To Find # of Degrees of Freedom

n - 1

To Find t Value

$$t = \frac{x - \ _{0}}{\frac{s}{\sqrt{n}}}$$

Statistical Family Tree