Final Project

I: Z-Test

(i) Calculating $\sigma_{\bar{x}}$ w/ Actual Sample of Size N $\{x_1, x_2, \dots, x_N\}$

(ii) If we know $\sigma :=$ St Deviation of Original Population

The we make $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{N}}$ [Preferred Method]

(iii) [Alternate Method]

First Calculate $s :=$ s.t Deviation of $\{x_1, \dots, x_N\}$

Let $\mu_x = \frac{1}{N}(x_1 + \dots + x_N)$; $s^2 = \frac{1}{N}\left[(x_1-\mu_x)^2 + (x_2-\mu_x)^2 + \dots + (x_N-\mu_x)^2\right]$

Calculate: $\sigma_{\bar{x}} = \frac{s}{\sqrt{N-1}}$

Testing Your Hypothesis

(i) Collect All Needed Information; H_0, $\bar{X} = \bar{x}$ N, $\sigma_{\bar{x}}$, σ (If you have it)

(ii) Draw Your Hypothesis

* Determine if Left, Right or Two-Tail Test

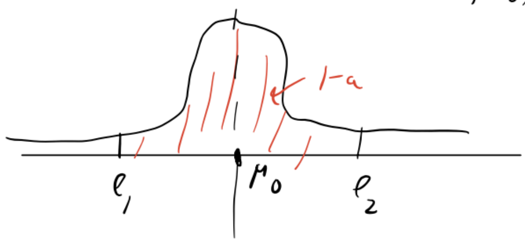
(iii) Do Your Work on $N(z, 0, 1)$

(iv) Use Z-Transform To Test Point Estimate $\bar{X} = \bar{x}$ with pre-determined a Confidence

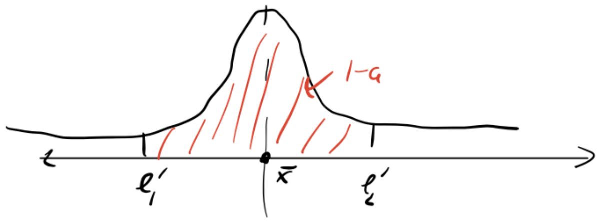
* (v) [After Applying Z-Test in Final Project For Personal Interest]

Assume That Instead of $E(X)=\mu_0$ Let's Assume Initially $E(X)=\bar{x}$; Find w/ a confidence what this Interval will be

* When we Test we have $N(\bar{X}, \mu_0, \sigma_{\bar{x}})$ and we calculate



* For Step (v) Do the same Thing Except use $N(\bar{X}, \bar{x}, \sigma_{\bar{x}})$



* This Tells You How Far Away From our Point Estimate is From Actual Average of Population w/ a confidence

II: Chi-Squared

Testing You Hypothesis

a) Table of Collected Values [two-to-Twenty Unique Values]
[Multiple occurances of Each Value]

*b) Each Value Must Occurr At-Least 5-Times

c) [Goodness To Fit] A Hypothesis About the Expected Distributions of The Data

c') [Test For Indepence] Use The Method to Calculate The Expected Values Assumming Indepence $E_{ij} = \frac{Row_i \cdot Col_j}{Total}$

d) Calculate Degrees of Freedom
If a list of length N $d.f := N-1$
If a Table with Rows, Cols $d.f = (Row - 1)(Cols - 1)$

e) Need a confidence $a \leq 5\%$

f) Need To make your calculations: $\chi^2 = \sum \frac{(O-E)^2}{E}$

g) Find χ^2_{crit} using χ^2-Table

h) Test if $\chi^2 \leq \chi^2_{crit}$ IF Yes Fail To Reject H_0
IF Not Reject H_0