First Assignment for BST 765

1. Choose a Method for Generating a Non-Normal Distribution (*F*).

PREEXISTING FUNCTION [e.g., SAS `RAND('CHISQUARE',4)`]

https://amadeus.co.uk/tips/why-is-the-rand-function-better-than-ranuni-and-rannor/

POLYNOMIAL METHOD (Fleishman or Headrick)

METHOD OF YOUR OWN – *t* as a Function of Normal & χ^2

(Using Known Relationship among Distributions)

2. Generate Data from a Non-Normal Distribution (*F*) of your choice using a Sample Size of 100,000.

3. Fully Describe Your Method for Generating the Data

(As You would See in a Methods Section in a Simulation Study)

4. Report the Expected Moments (Mean, Variance, Skew, Excess Kurtosis) of your Chosen Distribution.

5. Report the Observed Moments (Mean, Variance, Skew, Excess Kurtosis) of your Chosen Distribution.

6. Evaluate the Goodness of Fit of the Generated (Observed) Distribution with the Expected Distribution.

Second Assignment for BST 765

1. Select Two Sample Sizes (*N*) one "Small" and one "Large."

2. Generate Data from a Non-Normal Distribution (*F*) of your choice.

3. Replicate this Process a "Large" Number of Times (*R*).

4. Justify your choices of *N*, *F*, and *R*.

5. Fully Describe Your Method for Generating the Data
(As You would See in a Methods Section in a Simulation Study)

6. Demonstrate and Discuss the Effect of the Central Limit Theorem on the Sampling Distribution of the Sample Mean.

7. Demonstrate and Discuss the Effect of the Central Limit Theorem on the Sampling Distribution of the Sample Variance.

Second Assignment for BST 765

1. Select a Research Design Matrix (e.g., 2-group comparison, ANCOVA, Multiple Regression)

2. Select a Statistic Based on the Design (e.g., Mean Difference, Regression Coefficient, t-test, F-test, Nonparametric test)

3. Select Two Sample Sizes (*N*) one "Small" and one "Large."

4. Generate Data from a Non-Normal Distribution (*F*) of your choice.

5. Replicate this Process a "Large" Number of Times (*R*).

6. Justify your choices of *N*, *F*, and *R*.

7. Fully Describe Your Method for Generating the Data
(As You would See in a Methods Section in a Simulation Study)

8a. Demonstrate and Discuss the Effect of the Central Limit Theorem on the Sampling Distribution of the Statistic.

AND/OR

8b. Demonstrate and Discuss the Rejection Rates or Coverage Probabilities for the Statistic for a given α.