MCA 103 - Assignment 3 **MCA First Year 2017**

Date of Issue 23rd October 2017 **Submission Date & Viva 14th November 2017**

General Instructions

- Programming language to be used is R for every aspect of calculation. No manual calculation should be done
- Do it in groups of two only.
- Please give all numerical answers to 6 digits of precision.
- CR will collect all the folders of all the groups in a pen-drive and submit it to me for evaluation maximum by 4pm.
- You may also refer to Stats with R (e-book) for syntax of specific commands.

Programming Instructions

- Note that all your programs should have proper alignment, indentation and proper comments.
- All constants / variables / functions etc. should have meaningful names.
- Overall, programs should be readable. If programs fails to execute in R, you will get zero for everything.
- Submission files – MyStatsCalci.R and MSCreadme.txt
- Read me files should give information about code, functions and data structures used, diagrammatic representation of the concepts, etc. You may refer to preparation of readme file from here.

Description

You are going to create your own Statistical Calculator. In this you should have two options for data entry:

1. Manual Command Line Entry
2. Reading data from CSV File (In-built function can be used)

You should NOT use in-built functions from R for implementing the various statistical functions, rather you should use in-built statistical functions to check the results of functions implemented by you. You must use pre-defined statistical tables for relevant functions.

The calculator should have following functionality.

1. Descriptive Analysis (Mean, Median, Mode, Variance, Standard Deviation, Mean Absolute Deviation, Range, Quartiles, IQR, Minimum, Maximum, Skewness, Kurtosis, Moments)

2. Predictive Analysis (Correlation, Multiple Linear Regression, Logistic Regression)

3. Probability Analysis (Permutations, Combinations, Basic Probability, Conditional Probability, Bayes Theorem)

4. Discrete Distribution Functions (Uniform, Bernoulli, Binomial, Geometric, Hyper-geometric, Negative Binomial, Poisson, Multinomial, Multivariate Hypergeometric)

5. Continuous Distribution Functions (Uniform, Normal, Bivariate Normal, Gamma, Exponential)

6. Sample Distribution Test Statistic (Chi-Square, Student t-test, F-test, Z-test, Shapiro Wilk test)

7. Interval Estimation (Estimation of Means, Estimation of Differences in Means, Estimation of Proportions, Estimation of Differences in Proportions, Estimation of Variances, Estimation of Ratio of Two Variances)

8. Non-Parametric Analysis (Sign Test, Wilcoxon Signed-Rank test, Mann-Whitney Test, Kruskal-Wallis Test)

9. Visualizations (Histograms, Line Graph, Bar Graph, Pie Chart, Scatter plot, Box-plot, q-q plot, Stem-leaf plot, Pareto Chart)

Extra Credits (Optional)

Development of Graphical User Interface will fetch additional marks.

All the Best