User Manual

Addressing User Inputs

**Matlab\_Project\_File\_Analysis** runs in the command window. For all inputs, type in the command line and press ENTER.

Any Yes/No verifications or X/Z selections are not case-sensitive, but input/output filenames are.

Quotes are not required around string inputs.

* Example: To input the filename SpearsNumUsableJokes.txt, you would enter exactly that in the command line (as opposed to ‘SpearsNumUsableJokes.txt’).

1 – Set Username

Assigns the username that will be printed to output file. This can be changed; it will prompt verification for the change, and only the last username set will be written to the file.

2 – Load Data File

Loads a text file for statistical analysis. Only one file will be loaded at a time.

The .txt extension must be entered as part of the filename input.

* Example: A text file in the current directory named KnightsWhoSayNi would be entered as KnightsWhoSayNi.txt in the command line.

The program assumes that all data within a file is associated with a single variable, and will load any number of rows and up to two columns of data. Any columns past the second will be ignored. Once a file is loaded, the program will display summary statistics for the data that was loaded and will take note of the number of data values (n).

To use a different file, the data file must be cleared from memory (feature 3).

**Testing**

Invalid file extension/filename – Must only load .txt files

* File names < 4 characters long are considered invalid (file must be at least ‘.txt’).
* Used invalid filenames, files ending in “.xlsx”, filenames shorter than 4 characters. Program checks whether or not the file ends in “.txt” before attempting to load.

Empty file – Must handle loading an empty file

* Used empty file in directory called testEmpty.txt. Displays a warning, then clears data file from memory.

Attempting to load a file containing non-numerical values

* Tried to load Matlab diary files from last semester. Notifies invalid input.

File doesn’t exist – Must be able to handle invalid user input

* Attempted inputs of filenames from other directories. Outputs message saying the file doesn’t appear in the current directory, then returns to the menu.

3 – Clear Data File from Memory

Clears data related to the loaded file, including the file itself, probability calculations, and whether or not the data reflects a large sample size.

The program will prompt user verification before clearing the data.

**Testing**

No data file loaded – Display an error message if attempting to clear nothing

* Attempted to clear memory multiple times in a row. Returns to menu.

4 – Set Output Filename

Sets a filename for writing analysis data. It can be changed, but only the last name set will be written to.

The file must be a text file, so the program automatically appends “.txt” on any input that doesn’t end in that extension.

* Example, the inputs SpearsPunAnalysis and SpearsPunAnalysis.txt will both be stored as SpearsPunAnalysis.txt for the output filename, whereas SpearsPunAnalysis.doc will be stored as SpearsPunAnalysis.doc.txt (which will still create a working .txt file).

**Testing**

Attempting to set a filename while one is already set – Must handle new input

* The program prompts verification, and will change the filename to the new input if the user wishes to continue. Otherwise, the old filename is kept.

Attempting to set a filename that matches a file that exists in the current directory

* The program notifies the user that the file will be overwritten. It prompts verification and, if the user wishes to continue, will set the filename.

5 – Plot Histogram

**Testing**

Attempting to plot without a file stored – Must be able to continue running without a file

* Notifies the user that no file is loaded, then returns to the menu.

6 – Plot Histogram Fit

**Testing identical to 5 – Plot Histogram**

7 – Plot Probability Plots

Displays a menu of possible probability plots, and allows the selection of any number of them to plot as subplots on the same figure. **All plots may take some time to appear.**

Input is a vector of the numbers associated with menu options (can choose the same plot multiple times), but accepts a maximum of 7 plots at once for ease of readability.

**Testing**

Selection vector is larger than 7

* Notifies the user that the input was too large, then clears all values past the 7th index.

Input is not a vector

* Tried scalars, strings, 2D matrices. Notifies user that the input was invalid, and requests valid input. Empty inputs set it to default (lognormal, normal)

Input is a vector, but some elements are not valid menu options – Must still plot valid inputs

* Tried values greater than 7, less than 1, values with decimals. Clears invalid values and rounds decimals from the selection vector, then begins plotting.

Negative values in the user file – Exponential, Rayleigh, and Weibull plots would produce errors

* Tested files with negative values and files with all zeros. Notifies user that these plots are invalid for the current file, then removes those plots (1, 6, and 7) from the selection.

8 – Probability of X or Z

If data is normally distributed (user input), the user chooses X or Z for probability calculations. Calculates the cumulative probability of an observation within that range (these can be entered in any order; program sorts the values). All valid inputs and calculations are stored in a structure (one for X and one for Z) that is used to write these calculations to the output file.

**Testing (Same for 9 – X or Z Given Probability)**

Attempting to use X without a file loaded

* Displays an error message, then returns to the menu.

Data not normally distributed – Must handle user input saying data would produce invalid probability results

* Displays an error message, then returns to the menu. Notes that data is not normally distributed, which will be written to the output file.

9 – Find X or Z for a Specific Probability

Prompts user to verify normal distribution of data, asks for X or Z calculations. Inputs user probability, then outputs the associated X or Z value corresponding to that cumulative probability. Inputs and calculations are stored in a structure used for printing to the data file.

**Testing (In addition to the same methods used for 8 – Probability of X or Z)**

Invalid probability – Must not attempt to calculate for invalid probabilities

* Tried p<0, p>1, p is NaN. Displays an error message, ends calculations, and returns to the menu.

10 – Display Summary Statistics

Prints summary statistics to the command window.

**Testing**

No file loaded to memory

* Tried using the feature without a file loaded. Displays error message and returns to menu.

11 – Exit

The program checks to see if an output file has been set. If one has, the file is created (if it didn’t exist) and opened. Variables related to the analysis of the data are written to the file (where applicable), the file is closed, and the program will be ended.

**Testing**

No output filename set – No data will be saved

* Tried to exit before setting filename. The user is given a yes/no prompt on whether to return to the menu or end the program.

Some or all variables not manipulated by user – No variable exists that can be written

* Tried to exit without using any features or only some features. The program checks that each variable exists before attempting to write.