**Assignment 1**

1) Frailty is physical weakness; lack of health or strength. Reduced grip strength in females correlated with higher frailty scores and vice versa. Hand grip strength can be quantified by measuring the amount of static force that the hand can squeeze around a dynamometer. The force has most commonly been measured in kilograms and pounds. The table below represents data from 10 female participants. The Height is measured in inches, Weight in pounds, Age in years, Grip strength in kilograms. Frailty is qualitative attribute indicated the presence or absence of the symptoms. Based on the following table, design the three stages of reproducible workflow, includes the work you can do and the folder structure in each stage (reference study case in chapter 3).  (5 points)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Height | Weight | Age | Grip strength | Frailty |
| 65.8 | 112 | 30 | 30 | N |
| 71.5 | 136 | 19 | 31 | N |
| 69.4 | 153 | 45 | 29 | N |
| 68.2 | 142 | 22 | 28 | Y |
| 67.8 | 144 | 29 | 24 | Y |
| 68.7 | 123 | 50 | 26 | N |
| 69.8 | 141 | 51 | 22 | Y |
| 70.1 | 136 | 23 | 20 | Y |
| 67.9 | 112 | 17 | 19 | N |
| 66.8 | 120 | 39 | 31 | N |

A: Works in Stage I (Data Collection)

1. This data should be entered into a spreadsheet program and saved as a CSV file.

2. Once this file is created, it should be given a name and saved in a useful location. (raw\_frailty\_data.csv)

3. At the same time that data are saved, a metadata file should also be created and saved with it.

4. Field codes indicate No frailty (N) and Frailty (Y) for the person.

The question then arises of where the file should be saved.

5. A common convention is to place all project files in a single directory, with a single layer of subdirectories for different types of files, such as data, source code, analysis results, etc.

5.To ensure that a script in the src directory will locate and save the appropriate files in the appropriate folders, we can modify the code to the below.

## Read in the raw data, assuming that we are working the src directory

raw\_frailty\_data <--read.csv(".../data\_raw/raw\_frailty\_data.csv")

## Clean the data if required, but here it is not necessarily required.

clean\_frailty\_data <---(raw\_frailty\_data)

## Write the clean data to disk

write.csv(clean\_frailty\_data, ".../data\_clean/clean.frailty\_data.csv")

6. The raw data files should never be altered, with all changes and modifications saved to a separate file.

2.Data analysis may be done manually using graphical tools. This is not recommended due to the difficulty of accurately capturing all of the minute details needed to allow a second researcher to exactly repeat the analysis without errors.

3. Several comments describing the analysis steps are included in the code . Although the relatively simple commands here do not require extensive explanation, comments should be used liberally in all code files. Comments should be used to describe why, and in a larger sense how, a desired analysis is being conducted.

4. At the conclusion of this stage, after the script ‘analysis.R’ has been run in the same manner as the previous ‘clean\_data.R’ script.

5.The ‘test\_results.txt’ file indicates that there are few factors like age, weight , grip strength mostly influence the frailty of person. we can also calculate quetelet index to determine the frailty.

## load clean data, assuming we re in the src directory

clean\_frailty\_data <-- read.csv( ".../data\_clean/clean.frailty\_data.csv")

## calculate the quetelet index and also use step wise regression models.

quetelet\_index <-- with (clean\_farilty\_data, quetelet\_index(weight~height))

## write test result to plain text file

capture.output( quetelet\_index, file=".../results/test\_results.txt")

| ----frailty\_project

|       | ---- data\_raw

|       |        | ----raw\_frailty\_data.csv

|       |        | -----README.txt

|       | ---- data\_clean

|       |        | ---- clean\_frailty\_data.csv

|       | ---- results

|       |        | ----- test\_results.txt

|       | ---- src

|       |        |---- analysis.R

|       |        |---- clean\_data.R