# Code Book

Here are the following codes that is used for reference in the tidy data. This is also where you can find the details of each variables and functions

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### Measurement Variable Code

The table below corresponds to the description of column names found in the tidy data set.

```
##    Code                                                    Description
## 1    V1                                 time.body.accelerometer.mean.(x-axis)
## 2    V2                                 time.body.accelerometer.mean.(y-axis)
## 3    V3                                 time.body.accelerometer.mean.(z-axis)
## 4    V4                                   time.body.accelerometer.SD.(x-axis)
## 5    V5                                   time.body.accelerometer.SD.(y-axis)
## 6    V6                                   time.body.accelerometer.SD.(z-axis)
## 7   V41                               time.gravity.accelerometer.mean.(x-axis)
## 8   V42                               time.gravity.accelerometer.mean.(y-axis)
## 9   V43                               time.gravity.accelerometer.mean.(z-axis)
## 10  V44                                 time.gravity.accelerometer.SD.(x-axis)
## 11  V45                                 time.gravity.accelerometer.SD.(y-axis)
## 12  V46                                 time.gravity.accelerometer.SD.(z-axis)
## 13  V81                             time.body.accelerometer.jerk.mean.(x-axis)
## 14  V82                             time.body.accelerometer.jerk.mean.(y-axis)
## 15  V83                             time.body.accelerometer.jerk.mean.(z-axis)
## 16  V84                               time.body.accelerometer.jerk.SD.(x-axis)
## 17  V85                               time.body.accelerometer.jerk.SD.(y-axis)
## 18  V86                               time.body.accelerometer.jerk.SD.(z-axis)
## 19 V121                                      time.body.gyroscope.mean.(x-axis)
## 20 V122                                      time.body.gyroscope.mean.(y-axis)
## 21 V123                                      time.body.gyroscope.mean.(z-axis)
## 22 V124                                        time.body.gyroscope.SD.(x-axis)
## 23 V125                                        time.body.gyroscope.SD.(y-axis)
## 24 V126                                        time.body.gyroscope.SD.(z-axis)
## 25 V161                                 time.body.gyroscope.jerk.mean.(x-axis)
## 26 V162                                 time.body.gyroscope.jerk.mean.(y-axis)
## 27 V163                                 time.body.gyroscope.jerk.mean.(z-axis)
## 28 V164                                   time.body.gyroscope.jerk.SD.(x-axis)
## 29 V165                                   time.body.gyroscope.jerk.SD.(y-axis)
## 30 V166                                   time.body.gyroscope.jerk.SD.(z-axis)
## 31 V201                              time.body.accelerometer.magnitude.mean.()
## 32 V202                                time.body.accelerometer.magnitude.SD.()
## 33 V214                           time.gravity.accelerometer.magnitude.mean.()
## 34 V215                             time.gravity.accelerometer.magnitude.SD.()
## 35 V227                         time.body.accelerometer.jerk.magnitude.mean.()
## 36 V228                           time.body.accelerometer.jerk.magnitude.SD.()
## 37 V240                                  time.body.gyroscope.magnitude.mean.()
## 38 V241                                    time.body.gyroscope.magnitude.SD.()
## 39 V253                              time.body.gyroscope.jerk.magnitude.mean.()
## 40 V254                                time.body.gyroscope.jerk.magnitude.SD.()
## 41 V266                 fast.fourier.transform.body.accelerometer.mean.(x-axis)
```

```
## 42 V267              fast.fourier.transform.body.accelerometer.mean.(y-axis)
## 43 V268              fast.fourier.transform.body.accelerometer.mean.(z-axis)
## 44 V269                fast.fourier.transform.body.accelerometer.SD.(x-axis)
## 45 V270                fast.fourier.transform.body.accelerometer.SD.(y-axis)
## 46 V271                fast.fourier.transform.body.accelerometer.SD.(z-axis)
## 47 V294          fast.fourier.transform.body.accelerometer.mean.Freq(x-axis)
## 48 V295          fast.fourier.transform.body.accelerometer.mean.Freq(y-axis)
## 49 V296          fast.fourier.transform.body.accelerometer.mean.Freq(z-axis)
## 50 V345         fast.fourier.transform.body.accelerometer.jerk.mean.(x-axis)
## 51 V346         fast.fourier.transform.body.accelerometer.jerk.mean.(y-axis)
## 52 V347         fast.fourier.transform.body.accelerometer.jerk.mean.(z-axis)
## 53 V348           fast.fourier.transform.body.accelerometer.jerk.SD.(x-axis)
## 54 V349           fast.fourier.transform.body.accelerometer.jerk.SD.(y-axis)
## 55 V350           fast.fourier.transform.body.accelerometer.jerk.SD.(z-axis)
## 56 V373     fast.fourier.transform.body.accelerometer.jerk.mean.Freq(x-axis)
## 57 V374     fast.fourier.transform.body.accelerometer.jerk.mean.Freq(y-axis)
## 58 V375     fast.fourier.transform.body.accelerometer.jerk.mean.Freq(z-axis)
## 59 V424                  fast.fourier.transform.body.gyroscope.mean.(x-axis)
## 60 V425                  fast.fourier.transform.body.gyroscope.mean.(y-axis)
## 61 V426                  fast.fourier.transform.body.gyroscope.mean.(z-axis)
## 62 V427                    fast.fourier.transform.body.gyroscope.SD.(x-axis)
## 63 V428                    fast.fourier.transform.body.gyroscope.SD.(y-axis)
## 64 V429                    fast.fourier.transform.body.gyroscope.SD.(z-axis)
## 65 V452              fast.fourier.transform.body.gyroscope.mean.Freq(x-axis)
## 66 V453              fast.fourier.transform.body.gyroscope.mean.Freq(y-axis)
## 67 V454              fast.fourier.transform.body.gyroscope.mean.Freq(z-axis)
## 68 V503          fast.fourier.transform.body.accelerometer.magnitude.mean.()
## 69 V504            fast.fourier.transform.body.accelerometer.magnitude.SD.()
## 70 V513      fast.fourier.transform.body.accelerometer.magnitude.mean.Freq()
## 71 V516     fast.fourier.transform.body.accelerometer.jerk.magnitude.mean.()
## 72 V517       fast.fourier.transform.body.accelerometer.jerk.magnitude.SD.()
## 73 V526 fast.fourier.transform.body.accelerometer.jerk.magnitude.mean.Freq()
## 74 V529              fast.fourier.transform.body.gyroscope.magnitude.mean.()
## 75 V530                fast.fourier.transform.body.gyroscope.magnitude.SD.()
## 76 V539          fast.fourier.transform.body.gyroscope.magnitude.mean.Freq()
## 77 V542         fast.fourier.transform.body.gyroscope.jerk.magnitude.mean.()
## 78 V543           fast.fourier.transform.body.gyroscope.jerk.magnitude.SD.()
## 79 V552     fast.fourier.transform.body.gyroscope.jerk.magnitude.mean.Freq()
```

*Sadly, the table doesn't appear correctly on .md files*

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**Variables**

The following variables are pre-processed and automatically creates after executing certain functions.

- **modfeature** - Created after performing the function `mean_sd_find()`. Creates a table that contains the descriptions of column names in the tidy data set. Same as the table given above.
- **downloaddate** - A variable created by `Sys.time` after doing the function `datacheck()`. Used to track the download date for reference.
- **listnum** - Created after performing the function `mean_sd_find()`. A vector of numbers that corresponds to the required columns where it contains mean() or std() of any measurement.

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**Functions**

The following functions were created for the analysis. Sorted by name.

- `activity_sub()` - A function that is used to change the numerical value to descriptive by the lookup table from `activity_labels.txt`
- `autobind()` - A function that automatically binds train and test data from the functions `test_tidy()` and `train_tidy()`. Created for the purpose of convenience
- `column_gsub()` - A function that substitutes keywords found in **modfeature** to give a descriptive explanation of the codes found in the tidy data set
- `datacheck()` - Downloads the given files in the study and records the date and time of download. A text input passed to this function is the file name (including the extension)
- `dataextract()` - Extracts the necessary files to be used in this project. The following files are: `features.txt`, `activity_labels.txt`, `X & Y Train`, `X & Y Test`, `subject_train`, and `subject_test`
- `mean_sd_find()` - A function that reads `features.txt` file and filters the required columns to be used. In addition, the variables **modfeature** and **listnum** would be created. Requires `dplyr`
- `mean_sd_summary()` - A function that groups the tidy data by Activity and Subject and calculates the mean of each group. A data frame must be passed to this function in order to use it.
- `simulation_analysis()` - Performs the analysis for you by automatically assigning variables and executing functions in order.
- `test_tidy()` - Creates a tidy table that uses the data in `subject_test.txt`, `X_test.txt`, `y_test.txt`, and **listnum**
- `train_tidy()` - Same function as `test_tidy()` but to be used in train data