**CodeBook tidy dataset HARUS**

**Source**

The dataset is derived from the dataset "Human Activity Recognition Using Smartphones”.  
This data set was originally made avaiable at: <http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones>

The used data was downloaded from:  
<https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip>

The naming convention for the data variables follows the industry standard [Google style guide](https://google-styleguide.googlecode.com/svn/trunk/Rguide.xml). In particular a period, ., is used to separate name components.

To prevent the variable names from becoming too long the following abbreviations are incorporated into the names.

| **abbreviation** | **full name** |
| --- | --- |
| t | time domain |
| f | frequency domain |
| body | body fixed reference frame |
| gravity | Earth fixed reference frame |
| acc | accelerometer reading |
| gyro | Gyroscope reading |
| mag | Euclidean magnitude |
| std | Standard Deviation |

**NOTE**: As usual, features for machine learning algorithms are dimensionless and normalized to the range [-1,1].

### Identifiers

There are two identifiers used to indicate the test person and the activity the test person was engaged in.

| **name** | **type** | **description** |
| --- | --- | --- |
| subject | integer | id assigned to the test person |
| activity | character | activity the test person was performing |

The raw data set contained 30 subjects each performing 6 activities.

### Time Domain Signals

The time domain signals were captured at a rate of 50 Hz and filtered to remove noise. All time domain signals are prefixed by a single t.

#### Accelerometer Signals

In the raw data set accelerometer signals were split into a body part and a gravity part. The body part being further split into a smooth part and a jerk part.

##### Smooth Body Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| t.body.acc.mean.X | numeric | mean X component |
| t.body.acc.std.X | numeric | standard deviation X component |
| t.body.acc.mean.Y | numeric | mean Y component |
| t.body.acc.std.Y | numeric | standard deviation Y component |
| t.body.acc.mean.Z | numeric | mean Z component |
| t.body.acc.std.Z | numeric | standard deviation Z component |
| t.body.acc.mag.mean | numeric | mean Euclidean magnitude |
| t.body.acc.mag.std | numeric | standard deviation Euclidean magnitude |

##### Jerk Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| t.body.acc.jerk.mean.X | numeric | mean X component |
| t.body.acc.jerk.std.X | numeric | standard deviation X component |
| t.body.acc.jerk.mean.Y | numeric | mean Y component |
| t.body.acc.jerk.std.Y | numeric | standard deviation Y component |
| t.body.acc.jerk.mean.Z | numeric | mean Z component |
| t.body.acc.jerk.std.Z | numeric | standard deviation Z component |
| t.body.acc.jerk.mag.mean | numeric | mean Euclidean magnitude |
| t.body.acc.jerk.mag.std | numeric | standard deviation Euclidean magnitude |

##### Smooth Gravity Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| t.gravity.acc.mean.X | numeric | mean X component |
| t.gravity.acc.std.X | numeric | standard deviation X component |
| t.gravity.acc.mean.Y | numeric | mean Y component |
| t.gravity.acc.std.Y | numeric | standard deviation Y component |
| t.gravity.acc.mean.Z | numeric | mean Z component |
| t.gravity.acc.std.Z | numeric | standard deviation Z component |
| t.gravity.acc.mag.mean | numeric | mean Euclidean magnitude |
| t.gravity.acc.mag.std | numeric | standard deviation Euclidean magnitude |

#### Gyroscope Signals

The gyroscope signals contains only a body part. Again, the body part is split into a smooth signal and a jerk signal

##### Smooth Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| t.body.gyro.mean.X | numeric | mean X component |
| t.body.gyro.std.X | numeric | standard deviation X component |
| t.body.gyro.mean.Y | numeric | mean Y component |
| t.body.gyro.std.Y | numeric | standard deviation Y component |
| t.body.gyro.mean.Z | numeric | mean Z component |
| t.body.gyro.std.Z | numeric | standard deviation Z component |
| t.body.gyro.mag.mean | numeric | mean Euclidean magnitude |
| t.body.gyro.mag.std | numeric | standard deviation Euclidean magnitude |

##### Jerk Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| t.body.gyro.jerk.mean.X | numeric | mean X component |
| t.body.gyro.jerk.std.X | numeric | standard deviation X component |
| t.body.gyro.jerk.mean.Y | numeric | mean Y component |
| t.body.gyro.jerk.std.Y | numeric | standard deviation Y component |
| t.body.gyro.jerk.mean.Z | numeric | mean Z component |
| t.body.gyro.jerk.std.Z | numeric | standard deviation Z component |
| t.body.gyro.jerk.mag.mean | numeric | mean Euclidean magnitude |
| t.body.gyro.jerk.mag.std | numeric | standard deviation Euclidean magnitude |

### Frequency Domain Signals

The frequency domain signals are obtain by apply a Fast Fourier Transform (FFT) to the time domain signals. All frequency domain signals are prefixed by a single f.

#### Accelerometer Signals

In the raw data set accelerometer signals were split into a smooth part and a jerk part.

##### Smooth Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| f.body.acc.mean.X | numeric | mean X component |
| f.body.acc.std.X | numeric | standard deviation X component |
| f.body.acc.mean.Y | numeric | mean Y component |
| f.body.acc.std.Y | numeric | standard deviation Y component |
| f.body.acc.mean.Z | numeric | mean Z component |
| f.body.acc.std.Z | numeric | standard deviation Z component |
| f.body.acc.mag.mean | numeric | mean Euclidean magnitude |
| f.body.acc.mag.std | numeric | standard deviation Euclidean magnitude |

##### Jerk Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| f.body.acc.jerk.mean.X | numeric | mean X component |
| f.body.acc.jerk.std.X | numeric | standard deviation X component |
| f.body.acc.jerk.mean.Y | numeric | mean Y component |
| f.body.acc.jerk.std.Y | numeric | standard deviation Y component |
| f.body.acc.jerk.mean.Z | numeric | mean Z component |
| f.body.acc.jerk.std.Z | numeric | standard deviation Z component |

#### Gyroscope Signals

The gyroscope signals contains only a smooth body part.

##### Smooth Signals

| **name** | **type** | **description** |
| --- | --- | --- |
| f.body.gyro.mean.X | numeric | mean X component |
| f.body.gyro.std.X | numeric | standard deviation X component |
| f.body.gyro.mean.Y | numeric | mean Y component |
| f.body.gyro.std.Y | numeric | standard deviation Y component |
| f.body.gyro.mean.Z | numeric | mean Z component |
| f.body.gyro.std.Z | numeric | standard deviation Z component |