CODEBOOK for the data set

This codebook is divided into two parts. First part explains about the variable labels (i.e. what they are meant) and second part tabulates all variables along with their summaries. The acceleration and angle of the body are measured by Accelerometer and Gyroscope while doing various activities; further, acceleration and angle of the body was also measured while there was a jerk in the motion. These measurements are tabulated with respect to time and frequency.

Every variable name contains certain terms which are explained below,

- **"Time"** refers to measurements which are made w.r.t time
- **"Freq"** refers to measurements w.r.t frequency
- **"Body"** implies that every measurement is done while the sensors are mounted on the body
- **"Gravity"** refers to acceleration due to gravity
- **"Accel"** refers to acceleration measurement taken from accelerometer
- **"Gyro"** refers to gyroscopic measurement of angle taken from gyroscope
- **"X"**, **"Y"** and **"Z"** refers to the components of measurement, i.e. the measurements are recorded along X, Y and Z Cartesian axis
- **"Jerk"** refers to measurement when the body was in a jerk motion
- The suffix **"Mag"** refers to the vector magnitude of their respective measurements
- For each variable 128 measurements were made, while the subject did six different activities, namely walking, walking upstairs, walking downstairs, Sitting, standing and laying. These values were summarized by mean and standard deviation. The suffix **"Mean"** and **"Std"** refers to mean and standard deviation of respective variable measurements
- Finally, all values of variables are normalized, so they are **non-dimensional (no units)**

Variable Name	Variable Description	Class	Minimum	Maximum	Values/Explanation
subject_id	ID of the subject	Factor	NA	NA	Factor with 30 Levels from 1 to 30
TimeBodyAccelMeanX	Mean Acceleration of body measured with respect to time in X direction	Numeric	0.2215982	0.301461	
TimeBodyAccelMeanY	Mean Acceleration of body measured with respect to time in Y direction	Numeric	-0.001308288	-0.040513953	
TimeBodyAccelMeanZ	Mean Acceleration of body measured with respect to time in Z direction	Numeric	-0.07537847	-0.1525139	
TimeBodyAccelStdX	Standard deviation of Acceleration of body measured with respect to time in X direction	Numeric	-0.008659219	0.626917071	
TimeBodyAccelStdY	Standard deviation of Acceleration of body measured with respect to time in Y direction	Numeric	-0.002320265	0.616937015	

TimeBodyAccelStdZ	Standard deviation of Acceleration of body measured with respect to time in Z direction	Numeric	-0.0077153	0.60901788	
TimeGravityAccelMeanX	Mean acceleration due to gravity measured with respect to time in X direction	Numeric	-0.134832	0.9745087	
TimeGravityAccelMeanY	Mean acceleration due to gravity measured with respect to time in Y direction	Numeric	-0.002814673	0.956593814	
TimeGravityAccelMeanZ	Mean acceleration due to gravity with respect to time in Z direction	Numeric	-0.001993106	0.957873042	
TimeGravityAccelStdX	Standard deviation of acceleration due to gravity measured with respect to time in X direction	Numeric	-0.8295549	-0.9967642	
TimeGravityAccelStdY	Standard deviation of acceleration due to gravity measured with respect to time in Y direction	Numeric	-0.6435784	-0.9942476	
TimeGravityAccelStdZ	Standard deviation of acceleration due to gravity measured with respect to time in Z direction	Numeric	-0.6101612	-0.9909572	
TimeBodyAccelJerkMeanX	Mean Acceleration measured during Jerk with respect to time in X direction	Numeric	0.0426881	0.13019304	
TimeBodyAccelJerkMeanY	Mean Acceleration measured during Jerk with respect to time in Y direction	Numeric	-1.09E-02	9.91E-03	
TimeBodyAccelJerkMeanZ	Mean Acceleration measured during Jerk with respect to time in Z direction	Numeric	-1.00E-02	9.42E-03	
TimeBodyAccelJerkStdX	Standard deviation of Acceleration measured during Jerk with respect to time in X direction	Numeric	-0.003583389	0.544273037	
TimeBodyAccelJerkStdY	Standard deviation of Acceleration measured during Jerk with respect to time in Y direction	Numeric	-0.01235011	0.355306717	
TimeBodyAccelJerkStdZ	Standard deviation of Acceleration measured during Jerk with respect to time in Z direction	Numeric	-0.01351363	0.03101571	

TimeBodyGyroMeanX	Mean Gyroscopic angle measured respect to time in X direction	Numeric	-0.002826419	0.192704476	
TimeBodyGyroMeanY	Mean Gyroscopic angle measured with respect to time in Y direction	Numeric	-0.00247162	0.027470756	
TimeBodyGyroMeanZ	Mean Gyroscopic angle measured with respect to time in Z direction	Numeric	-0.000233248	0.179102058	
TimeBodyGyroStdX	Standard deviation of Gyroscopic angle measured respect to time in X direction	Numeric	-0.0264358	0.2676572	
TimeBodyGyroStdY	Standard deviation of Gyroscopic angle measured with respect to time in Y direction	Numeric	-0.01483926	0.476518714	
TimeBodyGyroStdZ	Standard deviation of Gyroscopic angle measured respect to time in Z direction	Numeric	-0.03140835	0.56487582	
TimeBodyGyroJerkMeanX	Mean Gyroscopic angle measured during Jerk with respect to time in X direction	Numeric	-0.02209163	-0.15721254	
TimeBodyGyroJerkMeanY	Mean Gyroscopic angle measured during Jerk with respect to time in Y direction	Numeric	-0.01320228	-0.07680899	
TimeBodyGyroJerkMeanZ	Mean Gyroscopic angle measured during Jerk with respect to time in Z direction	Numeric	-0.006940664	-0.092499853	
TimeBodyGyroJerkStdX	Standard deviation Gyroscopic angle measured during Jerk with respect to time in X direction	Numeric	-0.1639449	0.17914865	
TimeBodyGyroJerkStdY	Standard deviation Gyroscopic angle measured during Jerk with respect to time in Y direction	Numeric	-0.01462992	0.29594593	
TimeBodyGyroJerkStdZ	Standard deviation Gyroscopic angle measured during Jerk with respect to time in Z direction	Numeric	-0.034421747	0.193206499	
TimeBodyAccelMagMean	Mean magnitude of acceleration with respect to time	Numeric	-0.000971395	0.644604325	
TimeBodyAccelMagStd	Standard deviation of magnitude of acceleration with respect to time	Numeric	-0.01357712	0.42840592	

TimeGravityAccelMagMean	Mean magnitude of acceleration due to gravity with respect to time	Numeric	-0.000971395	0.644604325	
TimeGravityAccelMagStd	Standard deviation of magnitude of acceleration due to gravity with respect to time	Numeric	-0.01357712	0.42840592	
TimeBodyAccelJerkMagMean	Mean magnitude of acceleration during Jerk with respect to time	Numeric	-0.017978463	0.434490401	
TimeBodyAccelJerkMagStd	Standard deviation of magnitude of acceleration during Jerk with respect to time	Numeric	-0.02028505	0.45061207	
TimeBodyGyroMagMean	Mean magnitude of Gyroscopic angle with respect to time	Numeric	-0.003102438	0.418004609	
TimeBodyGyroMagStd	Standard deviation of magnitude of Gyroscopic angle with respect to time	Numeric	-0.02184632	0.29997598	
TimeBodyGyroJerkMagMean	Mean magnitude of Gyroscopic angle during Jerk with respect to time	Numeric	-0.04631178	0.08758166	
TimeBodyGyroJerkMagStd	Standard deviation of magnitude of Gyroscopic angle during Jerk with respect to time	Numeric	-0.0438985	0.2501732	
FreqBodyAccelMeanX	Mean Acceleration of body measured with respect to frequency in X direction	Numeric	-0.02262392	0.53701202	
FreqBodyAccelMeanY	Mean Acceleration of body measured with respect to frequency in Y direction	Numeric	-0.006237	0.524187687	
FreqBodyAccelMeanZ	Mean Acceleration of body measured with respect to frequency in Z direction	Numeric	-0.04769426	0.28073595	
FreqBodyAccelStdX	Standard deviation of Acceleration of body measured with respect to frequency in X direction	Numeric	-0.004738197	0.658506543	
FreqBodyAccelStdY	Standard deviation of Acceleration of body measured with respect to frequency in Y direction	Numeric	-0.002562942	0.560191344	
FreqBodyAccelStdZ	Standard deviation of Acceleration of body	Numeric	-0.03379653	0.68712416	

	measured with respect to frequency in Z direction				
FreqBodyAccelJerkMeanX	Mean Acceleration measured during Jerk with respect to frequency in X direction	Numeric	-0.007014723	0.474317256	
FreqBodyAccelJerkMeanY	Mean Acceleration measured during Jerk with respect to frequency in Y direction	Numeric	-0.003091553	0.276716853	
FreqBodyAccelJerkMeanZ	Mean Acceleration measured during Jerk with respect to frequency in Z direction	Numeric	-0.02487898	0.15777569	
FreqBodyAccelJerkStdX	Standard deviation of Acceleration measured during Jerk with respect to frequency in X direction	Numeric	-0.004262891	0.476803887	
FreqBodyAccelJerkStdY	Standard deviation of Acceleration measured during Jerk with respect to frequency in Y direction	Numeric	-0.00175392	0.349771285	
FreqBodyAccelJerkStdZ	Standard deviation of Acceleration measured during Jerk with respect to frequency in Z direction	Numeric	-0.006236475	-0.99310776	
FreqBodyGyroMeanX	Mean Gyroscopic angle measured with respect to frequency in X direction	Numeric	-0.029997	0.47496245	
FreqBodyGyroMeanY	Mean Gyroscopic angle measured with respect to frequency in Y direction	Numeric	-0.05570225	0.32881701	
FreqBodyGyroMeanZ	Mean Gyroscopic angle measured with respect to frequency in Z direction	Numeric	-0.01050471	0.49241438	
FreqBodyGyroStdX	Standard deviation of Gyroscopic angle measured with respect to frequency in X direction	Numeric	-0.1083888	0.1966133	
FreqBodyGyroStdY	Standard deviation of Gyroscopic angle measured with respect to frequency in Y direction	Numeric	-0.02848957	0.64623364	
FreqBodyGyroStdZ	Standard deviation of Gyroscopic angle measured with respect to frequency in Z direction	Numeric	-0.08225211	0.52245422	
FreqBodyAccelMagMean	Mean magnitude of acceleration with respect to frequency	Numeric	-0.003533418	0.586637551	

FreqBodyAccelMagStd	Standard deviation of magnitude of acceleration with respect to frequency	Numeric	-0.021478788	0.178684581	
FreqBodyAccelJerkMagMean	Mean magnitude of acceleration during Jerk with respect to frequency	Numeric	-0.012882383	0.538404846	
FreqBodyAccelJerkMagStd	Standard deviation of magnitude of acceleration during Jerk with respect to frequency	Numeric	-0.01395391	0.31634642	
FreqBodyGyroMagMean	Mean magnitude of Gyroscopic angle with respect to frequency	Numeric	-0.00036273	0.203979765	
FreqBodyGyroMagStd	Standard deviation of magnitude of Gyroscopic angle with respect to frequency	Numeric	-0.06147658	0.23665966	
FreqBodyGyroJerkMagMean	Mean magnitude of Gyroscopic angle during Jerk with respect to frequency	Numeric	-0.02290453	0.14661857	
FreqBodyGyroJerkMagStd	Standard deviation of magnitude of Gyroscopic angle during Jerk with respect to frequency	Numeric	-0.03985738	0.28783462	
activity	type of activity	Factor	NA	NA	Factor with 6 Levels – “WALKING” “WALKING_UPSTAIRS” “WALKING_DOWNSTAIRS” “SITTING” “STANDING” “LAYING”