# **DATA DICTIONARY - HUMAN ACTIVITY RECOGNITION USING SMARTPHONES DATASET**

### **Activity.Name:**

The label of each activity.

It is a character variable of 6 values: [WALKING, WALKING\_UPSTAIRS, WALKING\_DOWNSTAIRS, SITTING, STANDING, LAYING]

### **ID:**

The identifier of each subject.

It is an integer variable, wich range is from 1 to 30.

**Activity**:

The encoding of the variable Activity.Name.

It is an integer variable, wich range is from 1 to 6.

**tBodyAcc**:

**Time data** from the **accelerometer** separated into **body acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

tBodyAcc -mean()-X

tBodyAcc-mean()-Y

tBodyAcc-mean()-Z

tBodyAcc-std()-X

tBodyAcc-std()-Y

tBodyAcc-std()-Z

**tGravityAcc**:

**Time data** from the **accelerometer** separated into **gravity acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

tGravityAcc -mean()-X

tGravityAcc-mean()-Y

tGravityAcc-mean()-Z

tGravityAcc-std()-X

tGravityAcc-std()-Y

tGravityAcc-std()-Z

**tBodyAccJerk**:

**Time data** from the **accelerometer** of **Jerk signals**, separated into **body acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

tBodyAccJerk -mean()-X

tBodyAccJerk-mean()-Y

tBodyAccJerk-mean()-Z

tBodyAccJerk-std()-X

tBodyAccJerk-std()-Y

tBodyAccJerk-std()-Z

**tBodyGyro**:

**Time data** from the **gyroscope** separated into **body acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

tBodyGyro -mean()-X

tBodyGyro-mean()-Y

tBodyGyro-mean()-Z

tBodyGyro-std()-X

tBodyGyro-std()-Y

tBodyGyro-std()-Z

**tBodyGyroJerk**:

**Time data** from the **gyroscope** of **Jerk signals**, separated into **body acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

tBodyGyroJerk -mean()-X

tBodyGyroJerk-mean()-Y

tBodyGyroJerk-mean()-Z

tBodyGyroJerk-std()-X

tBodyGyroJerk-std()-Y

tBodyGyroJerk-std()-Z

**tBodyAccMag**:

**The Euclidean norm of the three axial time data** from the **accelerometer** separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

tBodyAccMag -mean()

tBodyAccMag-std()

**tGravityAccMag**:

**The Euclidean norm of the three axial time data** from the **accelerometer** separated into **gravity acceleration** signals.

There are one for each measurement of mean and standard deviation:

tGravityAccMag -mean()

tGravityAccMag-std()

**tBodyAccJerkMag**:

**The Euclidean norm of the three axial time data** from the **accelerometer** of **Jerk signals**, separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

tBodyAccJerkMag -mean()

tBodyAccJerkMag -std()

**tBodyGyroMag**:

**The Euclidean norm of the three axial time data** from the **gyroscope** separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

tBodyGyroMag -mean()

tBodyGyroMag -std()

**tBodyGyroJerkMag**:

**The Euclidean norm of the three axial time data** from the **gyroscope** of **Jerk signals**, separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

tBodyGyroJerkMag -mean()

tBodyGyroJerkMag -std()

**fBodyAcc**:

**Frequency data** from the **accelerometer** separated into **body acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

fBodyAcc -mean()-X

fBodyAcc-mean()-Y

fBodyAcc-mean()-Z

fBodyAcc-std()-X

fBodyAcc-std()-Y

fBodyAcc-std()-Z

fBodyAcc-meanFreq()-X

fBodyAcc-meanFreq()-Y

fBodyAcc-meanFreq()-Z

**fBodyAccJerk**:

**Frequency data** from the **accelerometer** of **Jerk signals**, separated into **body acceleration** signals.There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

fBodyAccJerk -mean()-X

fBodyAccJerk-mean()-Y

fBodyAccJerk-mean()-Z

fBodyAccJerk-std()-X

fBodyAccJerk-std()-Y

fBodyAccJerk-std()-Z

fBodyAccJerk-meanFreq()-X

fBodyAccJerk-meanFreq()-Y

fBodyAccJerk-meanFreq()-Z

**fBodyGyro**:

**Frequency data** from the **gyroscope** separated into **body acceleration** signals.

There are one for each axial X,Y,Z and one for each measurement of mean and standard deviation:

fBodyGyro -mean()-X

fBodyGyro-mean()-Y

fBodyGyro-mean()-Z

fBodyGyro-std()-X

fBodyGyro-std()-Y

fBodyGyro-std()-Z

fBodyGyro-meanFreq()-X

fBodyGyro-meanFreq()-Y

fBodyGyro-meanFreq()-Z

**fBodyAccMag**:

**The Euclidean norm of the three axial frequency data** from the **accelerometer** separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

fBodyAccMag -mean()

fBodyAccMag-std()

fBodyAccMag-meanFreq()

**fBodyAccJerkMag**:

**The Euclidean norm of the three axial frequency data** from the **accelerometer** of **Jerk signals**, separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

fBodyAccJerkMag -mean()

fBodyAccJerkMag -std()

fBodyBodyAccJerkMag-meanFreq()

**fBodyGyroMag**:

**The Euclidean norm of the three axial frequency data** from the **gyroscope** separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

fBodyGyroMag -mean()

fBodyGyroMag -std()

fBodyBodyGyroMag-meanFreq()

**fBodyGyroJerkMag**:

**The Euclidean norm of the three axial frequency data** from the **gyroscope** of **Jerk signals**, separated into **body acceleration** signals.

There are one for each measurement of mean and standard deviation:

fBodyGyroJerkMag -mean()

fBodyGyroJerkMag -std()

fBodyBodyGyroJerkMag-meanFreq()

### **Angles between two vectors**

angle(tBodyAccMean,gravity)

angle(tBodyAccJerkMean),gravityMean)

angle(tBodyGyroMean,gravityMean)

angle(tBodyGyroJerkMean,gravityMean)

angle(X,gravityMean)

angle(Y,gravityMean)

angle(Z,gravityMean)

### **set**

New variable create to differentiate between data from test or from train.

It is a factor with two values: [train, test]

### **All features are normalized and bounded within [-1,1].**

The mean of each features by id and activity is in the book “Mean\_Features.xls”