```
                          Code Book

SUBJECT         2
     Person tracked during the training or the test
                1..30

ACTIVITY        1
     Activity performed
                1      WALKING
                2      WALKING_UPSTAIRS
                3      WALKING_DOWNSTAIRS
                4      SITTING
                5      STANDING
                6      LAYING
```

Other column names represent average mean and standard deviation of
features selected from the accelerometer and gyroscope. For details
refers to the excerpt (reproduced below) prepared by Non Linear
Complex Systems Laboratory of Università degli Studi di Genova.

Feature Selection
=================

The features selected for this database come from the accelerometer
and gyroscope 3-axial raw signals tAcc-XYZ and tGyro-XYZ. These time
domain signals (prefix 't' to denote time) were captured at a constant
rate of 50 Hz. Then they were filtered using a median filter and a 3rd
order low pass Butterworth filter with a corner frequency of 20 Hz to
remove noise. Similarly, the acceleration signal was then separated
into body and gravity acceleration signals (tBodyAcc-XYZ and
tGravityAcc-XYZ) using another low pass Butterworth filter with a
corner frequency of 0.3 Hz.

Subsequently, the body linear acceleration and angular velocity were
derived in time to obtain Jerk signals (tBodyAccJerk-XYZ and
tBodyGyroJerk-XYZ). Also the magnitude of these three-dimensional
signals were calculated using the Euclidean norm (tBodyAccMag,
tGravityAccMag, tBodyAccJerkMag, tBodyGyroMag, tBodyGyroJerkMag).

Finally a Fast Fourier Transform (FFT) was applied to some of these
signals producing fBodyAcc-XYZ, fBodyAccJerk-XYZ, fBodyGyro-XYZ,
fBodyAccJerkMag, fBodyGyroMag, fBodyGyroJerkMag. (Note the 'f' to
indicate frequency domain signals).

These signals were used to estimate variables of the feature vector
for each pattern:
'-XYZ' is used to denote 3-axial signals in the X, Y and Z directions.

```
tBodyAcc-XYZ
tGravityAcc-XYZ
tBodyAccJerk-XYZ
tBodyGyro-XYZ
tBodyGyroJerk-XYZ
tBodyAccMag
tGravityAccMag
tBodyAccJerkMag
tBodyGyroMag
tBodyGyroJerkMag
fBodyAcc-XYZ
fBodyAccJerk-XYZ
fBodyGyro-XYZ
fBodyAccMag
fBodyAccJerkMag
fBodyGyroMag
fBodyGyroJerkMag
```

The set of variables that were estimated from these signals are:

```
mean(): Mean value
std(): Standard deviation
mad(): Median absolute deviation
max(): Largest value in array
min(): Smallest value in array
sma(): Signal magnitude area
energy(): Energy measure. Sum of the squares divided by the number of
values.
iqr(): Interquartile range
entropy(): Signal entropy
arCoeff(): Autorregresion coefficients with Burg order equal to 4
correlation(): correlation coefficient between two signals
maxInds(): index of the frequency component with largest magnitude
meanFreq(): Weighted average of the frequency components to obtain a
mean frequency
skewness(): skewness of the frequency domain signal
kurtosis(): kurtosis of the frequency domain signal
bandsEnergy(): Energy of a frequency interval within the 64 bins of
the FFT of each window.
angle(): Angle between to vectors.
```

Additional vectors obtained by averaging the signals in a signal
window sample. These are used on the angle() variable:

```
gravityMean
tBodyAccMean
tBodyAccJerkMean
tBodyGyroMean
```

tBodyGyroJerkMean

The complete list of variables of each feature vector is available in 'features.txt'