Homework 5

Due: end of day Saturday, March 4

Submission instructions: Submit one write-up per group on gradescope.com.

IMPORTANT:

- Write names of everyone that worked on the assignment on the submission.
- Specify every member of the group when submitting on Gradescope (https://help.gradescope.com/article/m5qz2xsnjy-student-add-group-members)

Question 1

Smart health and fitness monitoring devices (for example, created by FitBit, Nike, Adidas, Misfit Shine, ...) are very popular. They are also useful for analyzing person's daily physical activities and recommending health-enhancing exercises. At their core, how do these devices work? Before analyzing human activities, the first thing the device needs to do is to recognize which activities are being performed in the first place.

This experiment[1] monitors people carrying Samsung Galaxy smartphones. Measurements are collected using the phones' accelerometers and gyroscopes, while subjects perform 6 different activites:

- WALKING
- WALKING_UPSTAIRS
- WALKING_DOWNSTAIRS
- SITTING
- STANDING
- LAYING

Your task is to classify person's activity based on the phones recordings.

The preprocessed data has been cleaned and normalized, so you are not expected to do any further cleaning.

```
load('HumanActivityRecognition.RData')
```

Your tasks:

1. Build a Neural Network model to classify the 6 activity patterns and report your Accuracy on the Test set
2. Build a tree-based model (or a few) to do the same thing. Compare accuracy on the test set with that of Neural Networks.

[1] http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones