

Data Science Evaluation

Test 1:

There is an exercise in this evaluation, which is intended to help us understand your analytical strengths. We are more interested in how you approach the problem and reach an answer than getting the absolute best score or solution, so feel free to apply your skills and knowledges as you feel is appropriate and be sure to document all of the steps that you took to reach the solution.

Description

In the zip file you will find a dataset containing of 6 ambulatory activities, performed by 33 participants. Data are recorded with two tri-axial accelerometers sampling at 100Hz, mounted on the dominant side wrist and the thigh of the participant. The data information is as follows:

1. Data collection method:

Each participant performed an activity for approximately 3 minutes.

2. Sensors:

Axivity AX3 3-Axis Logging Accelerometer

- sampling frequency -- 100Hz
- range -- 8g

3. Activity Classes:

- Walking Upstairs
- Walking Downstairs
- Walking in slow pace
- Walking in medium pace
- Walking in fast pace
- Jogging

4. Data folder:

Dataset has two folders, and one folder is for sensor modality named "w" for wrist and the other one is for sensor modality named "t" for thigh.

Inside "w" and "t" folders, there are 6 sub folders, and one folder for each activity class. And inside each activity folder, there are 33 files, one file for each participant.

The folder name actually indicates human activity type and you can use the folder name as **the label name**.

5. Attribute Information:

The 4 columns in the files in t and w folder is organized as follows:

- 1 -- timestamp
- 2 -- x value
- 3 -- y value
- 4 -- z value

Goal

The goal of this test is to build a **deep learning model** to predict human activities based on the training data set. In other words, we would like to see how you will use sensor data from wrist and tight to predict the human activities, which have 6 different types in total. For example, given the sensor data, your built model needs to predict the label of human activity such as "walk_slow" or "jogging".

In your submission, please include a document about your findings and results analysis and attach your source code. In your report, please include the details about the following steps:

1. Dataset exploration and preprocessing.
2. Feature engineering
3. Modeling
4. Results analysis and evaluation