Classification of Daily and Sport Activities Based on Body Sensor Data

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Dataset: It contains 9120 measurements from body sensors and class labels for 19 different physical activities performed during measurements. The measurements were done on 4 male and 4 female participants between 20 and 30 years old and each activity was performed for 5 minutes.

Data structure: The data are structured so that each file represents a set of measurement samples in a 5s window for each combination of participant and activity (so there are 60 such files for each of these combinations). There are 125 samples in each file, containing values from 45 sensors. The participant and the activity are given by the directory path leading to the file.

Expected Output: It's a class label that ranges from 1 to 19 and expresses the activity performed, e.g., sitting (0), standing (1), …

Objective: The goal is to compare different classification algorithms on the same task giving, as much as possible, the same starting conditions. Those algorithms must be available in public packages.
The evaluation metrics focus on accuracy, training time and processing time needed to classify a new instance.
The methods and algorithms under analysis are:

- k-NN
- logistic regression
- decision tree
- multilayer perceptron neural network

Based on the results, some observations and considerations will be provided, not only about the performance but also about the ease of usage (for the libraries interfaces providing algorithms implementation) *(Format 2).*

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