AML Project - Group 23
Deliverable 1

Can we predict a type of physical activity from medical and body readings?

Our dataset consists of readings of nine individuals' chest, hand, and ankle temperatures, movements, and positions that were recorded from a variety of personal and medical devices. Additionally, the data shows what physical activity the individual was performing at the time of the record. We aim to train a model to predict the type of physical activity based on similar readings.

Dataset Identification and Description:

- Name: Physical Activity Monitoring Dataset
- Source: PAMAP2 Physical Activity Monitoring - UCI ML Repository
- Data Collection: Physical activities were performed by 9 subjects wearing 3 inertial measurement units and a heart rate monitor.
- Dataset Characteristics: Multivariate, Time-Series
- Size: 54 attributes, and 2.86M records (We are planning to reduce the data by dropping some percentage of samples for each class label.
- 18 unique labels for y-attribute.
- The 54 columns in the data files are organized as follows:
    - 1. timestamp (s)
    - 2. activityID
    - 3. heart rate (bpm)
    - 4-20. IMU hand
    - 21-37. IMU chest
    - 38-54. IMU ankle
- The IMU sensory data contains the following columns:
    - 1. temperature (°C)
    - 2-4. 3D-acceleration data (ms-2)
    - 5-7. 3D-acceleration data (ms-2)
    - 8-10. 3D-gyroscope data (rad/s)
    - 11-13. 3D-magnetometer data (Î¼T)
    - 14-17. orientation

Proposed ML techniques to apply for classification:

- KNN Classification
- Decision Tree