Coursework 1

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4. **Explanation of code preparation & understanding:**
   1. *Introduction of the flow of preprocessing:*

# The dataset preprocessed is Human Activity Recognition from mobile phone sensors. The dataset is collected for a Machine Learning model to predict whether a person is moving or standing. The data is collected from an IMU using mobile phone. The head 5 rows of data of the dataset are shown in Fig.1. The dataset consists of 4 types of data. The columns [accX, accY and accZ] mean acceleration collected in 3D dimension (x-direction, y-direction, and z-direction (vertically upward and downward). The datatype of the acceleration is floating number. Similarly, the columns [gyroX, gyroY and gyroZ] mean the angular velocity collected by gyroscope sensor in 3D dimension. The timestamp represents the time difference between when the mobile phone was open and when the sensor data was recorded. The format of timestamp is [minutes: seconds. Microseconds]. The activity means whether a person is moving or stopping. 1 means that person is moving and 0 means that person stops. Therefore, for a machine learning model, acceleration and angular velocity will become as features [X] and activity will become as label [y]. The timestamp will be used to preprocess the acceleration and angular velocity of the person. Also, the timestamp, acceleration and angular velocity will be combined with a motion machining learning model to predict the trajectory of a moving person.

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Fig.1top 5 rows of data in the dataset

图示

描述已自动生成

Fig.2 the flow chart of whole data preprocessing and preparation