Lab02 | GDF data and EEG manipulation

1. **Installing and using the biosig toolbox**
   a. Follow the instructions in the slides
   b. Download biosig toolbox from http://biosig.sourceforge.net/download.html
   c. Add biosig toolbox to your MATLAB path
   d. Verify that you can call the function `sload()`

2. **EEG data**
   a. Download EEG data from the repository in the Moodle
   b. For now, use only the first GDF file:
      `ah7.20170613.161402.offline.mi.mi_bhbf.gdf`

3. **First plots of EEG data**
   a. Load the EEG data from the provided GDF file with `sload()` function
   b. Plot 5 seconds of an EEG channel (amplitude vs. time)
   c. Subplot 5 seconds of 3 EEG channels (amplitude vs. time)
   d. Adjust the plots to have the same scale for all plotted channels

4. **Creation of the label vectors for the provided GDF file**
   a. Create `Tk` *[trial vector]* (1, 2, 3, … N)
   b. Create `Fk` *[fixation periods]* (0 or event value)
   c. Create `Ak` *[cue periods]* (0 or event value)
   d. Create `CFk` *[continuous feedback periods]* (0 or event value)
   e. Create `Xk` *[hit/miss periods]* (0 or event value)
   f. Plot the label vectors

5. **Concatenate each <u>offline</u> GDF file provided**
   a. Load each offline GDF file
   b. Concatenate the EEG
   c. Concatenate the events (`POS,TYP,DUR`).
      Be aware of the positions of the events from the second GDF file on

6. **Creation of the label vectors for the concatenated data**

7. **Trial extraction**
   a. Exploiting the label vectors, extract trials from the concatenated data
   b. Store the trials in a matrix [`samples x channels x trials`]
   c. Create a vector `Ck` with cue information regarding each trial [`trials x 1`]

8. **Visualization**
   a. Select a trial for each cue and plot a channel of your choice
   b. Compute the grand averages for each cue and plot a channel of your choice