ASSIGNMENT 1 (due 04.10.2021)

Import the sampleEEGdata.mat dataset in Matlab (you find it on the G Drive in the folder Code)
Figure 1: Compute the ERP at each electrode.
Figure 2: For the time points 0 to 400 ms in 100-ms steps, make a series of topographical plots in one figure with subplots.
Figure 3: To increase the signal-to-noise ratio, make each plot show the average of activity from 20 ms before until 20 ms after each time point. For example, the topographical plot from 200 ms should show average activity from 180 ms until 220 ms. Indicate the center time point in a title on each subplot.
2 points

Figure 4: Loop through each electrode and find the peak time of the ERP between 100 and 400 ms (hint: you can use function max).
Store these Nel peak times in a separate variable. Eliminate duplicates (hint: function unique) and then make topographical plot of peak times.
What areas of the scalp show the earliest and the latest peak responses to the stimulus within this window?
2 points

Figure 5: Create two kernels for convolution: one that looks like an inverted U (min at the edges, max in the center) and one that looks like a decay function (hint: 1/x). The kernels must be 20 samples long. There is no need to be too sophisticated in generating, for example, a Gaussian and an exponential; numerical approximations are fine. Plot them in a figure with 2 subplots
2 points

Figure 6: Convolve these two kernels with 50 time points of EEG data from one electrode. Make a plot showing the kernels, the EEG data, and the result of the convolution between the data and each kernel. Use time-domain convolution as explained in this chapter and as illustrated in the online Matlab code. Based on visual inspection, what is the effect of convolving the EEG data with these two kernels?
2 points