TUTORIAL TFA 2

Q1

Assuming a signal that has a sampling frequency fs= 20kHz is to be analysed.

(a) What window block length would you use to estimate the frequency components with at least 100 Hz of resolution

(b) Why is overlap block processing used in the formation of the Spectrogram and what overlap factor would you use in the formation of the STFTs in part (a) above?

(c) Why is windowing with windows other than the rectangular window necessary in the formation of the Spectrogram?

Q2

1. A signal has its frequency modulated by a sinusoid at 20 Hz and a duration of 0.5 seconds. Write the expression of the signal in continuous time;
2. What is the maximum frequency of the signal?
3. Write the expression of the signal in discrete time.
4. Sketch the Time-Frequency Distribution of the signal;
5. What time window length would you use to produce a spectrogram ?