Lab Exercises 2
ELEC 9723, Session 1 2017

Write a function in MATLAB that accepts as inputs

- **a speech signal (array)**
- **its sampling frequency (value)**
- **the length of the analysis window (value)**
- **the shape of the window (array) (optional)**
- **the duration separating the midpoints of two consecutive windows**

and produces as output the spectrogram of that signal.

Do NOT use any of MATLAB's built-in spectrogram estimation functions.

OPTIONAL: Write the above function without using the fft() command (or any other built-in function to computer the DFT) in MATLAB.

For the exercised below, you may need to use a different window size for each one. Try various reasonable values and decide what works best.

1. Read a speech file (`sample1.wav`) plot the spectrogram and identify voiced regions based on the spectrogram.

2. For this voiced region, estimate the approximate pitch range based on the spectrogram. What is the window size you use to do this?

3. For the same voiced region, estimate the contours of the 1st and 2nd formant from the spectrogram and sketch them. What is the window size you use to do this?

4. Compare the window sizes you used in the above two exercises, are they different? If so, why?