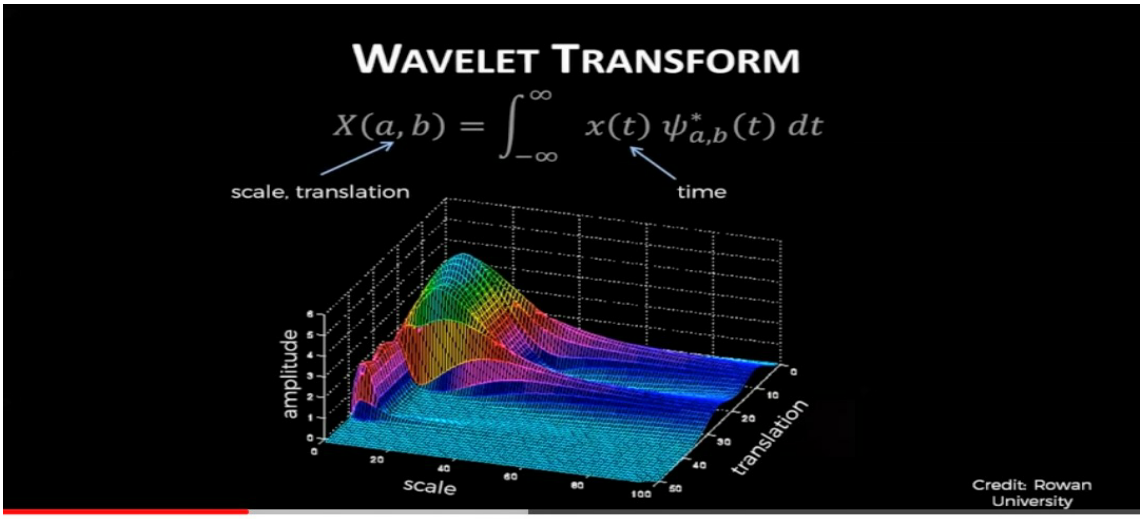
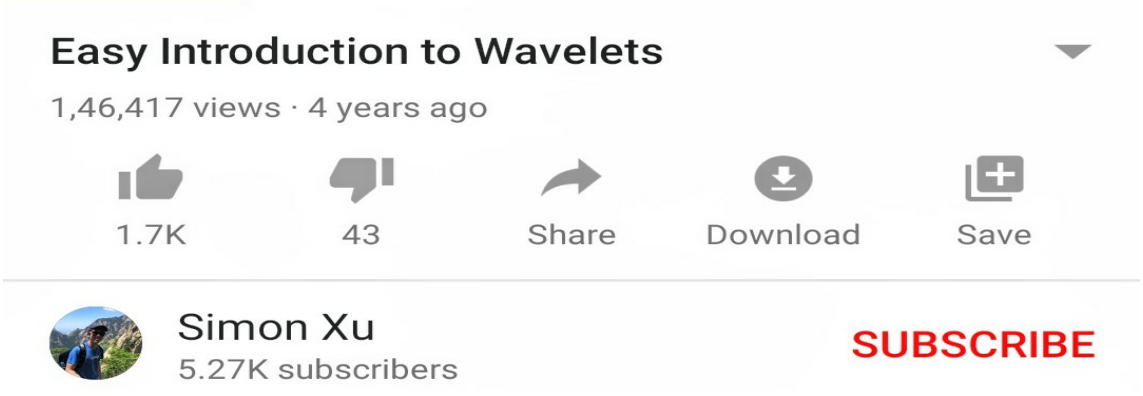
DAILY ASSESSMENT FORMAT

Date:	**25-05-2020**	**Name:**	**K Muthu**
Course:	**Digital Signal Processing**	**USN:**	**4al17ec038**
Topic:	Fourier Transform FIR and IIR Filters Wavelet Transform Short-time Fourier transform ECG Signal Analysis Using MATLAB	**Semester & Section:**	**6 & 'A'**
Github Repository:	**K.Muthu-courses**		

FORENOON SESSION DETAILS

Image of session





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Fourier Transform :

- The Fourier transform is a mathematical formula that relates a signal sampled in time or space to the same signal sampled in frequency.
- In signal processing, the Fourier transform can reveal important characteristics of a signal, namely, its frequency components.
- Fourier Transform simple use is to characterize the magnitude and phase of a signal.

$$X(k) = \frac{1}{N}\sum_{n=0}^{N-1} x(n)\cdot e^{-j\frac{2\pi}{N}kn} \qquad x(n) = \sum_{k=0}^{N-1} X(k)\cdot e^{j\frac{2\pi}{N}kn}$$

FIR and IIR Filters :

- A finite impulse response (FIR) filter is a filter whose impulse respons is of finite duration, because it settles to zero in finite time.

$$y(n) = \sum_{k=0}^{N-1} h(k)x(n-k)$$ **Difference Equation**

$$H(z) = \sum_{k=0}^{N-1} h(k)z^{-k}$$ **System function (Transfer function) equation**

- An infinite impulse response (IIR) filter is a digital filter that depends linearly on a finite number of input samples and a finite number of previous filter outputs.

➢ *Difference Equation*

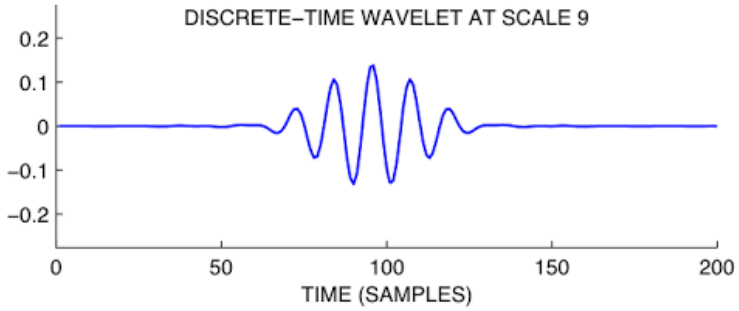
$$y(n) = \sum_{i=0}^{N} a_i x(n-i) + \sum_{j=1}^{N} b_j y(n-j)$$

➢ *Transfer Function*

$$H(z) = \frac{\sum_{i=0}^{N} a_i z^{-i}}{1 + \sum_{j=1}^{N} b_j z^{-j}}$$

Wavelet transform :

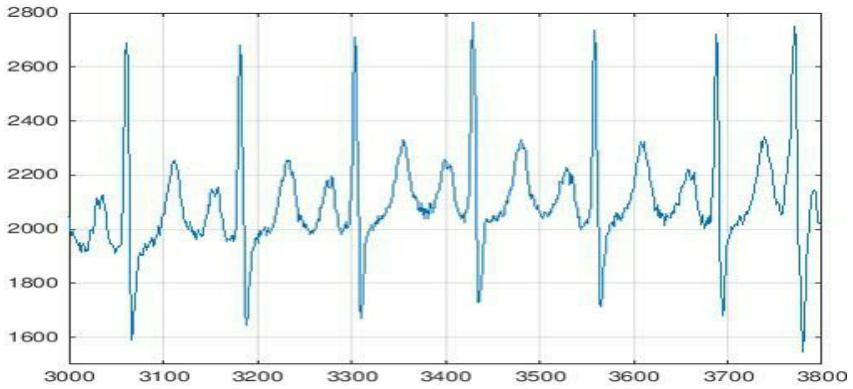
- Wavelet transforms are a mathematical means for performing signal analysis when signal frequency varies over time.
- For certain classes of signals and images, wavelet analysis provides more precise information about signal data than other signal analysis techniques.



Short-time Fourier transform :

- The Short-time Fourier transform (STFT), is a Fourier-related transform used to determine the sinusoidal frequency and phase content of local sections of a signal as it changes over time.
- In practice, the procedure for computing STFTs is to divide a longer time signal into shorter segments of equal length and then compute the Fourier transform separately on each shorter segment.
- This reveals the Fourier spectrum on each shorter segment.
- One then usually plots the changing spectra as a function of time, known as a spectrogram or waterfall plot.

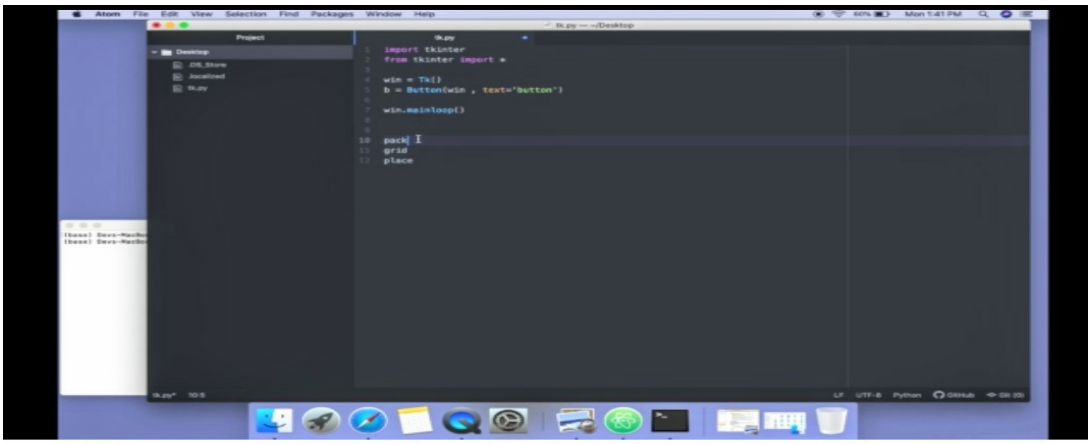
ECG Signal Analysis Using MATLAB :

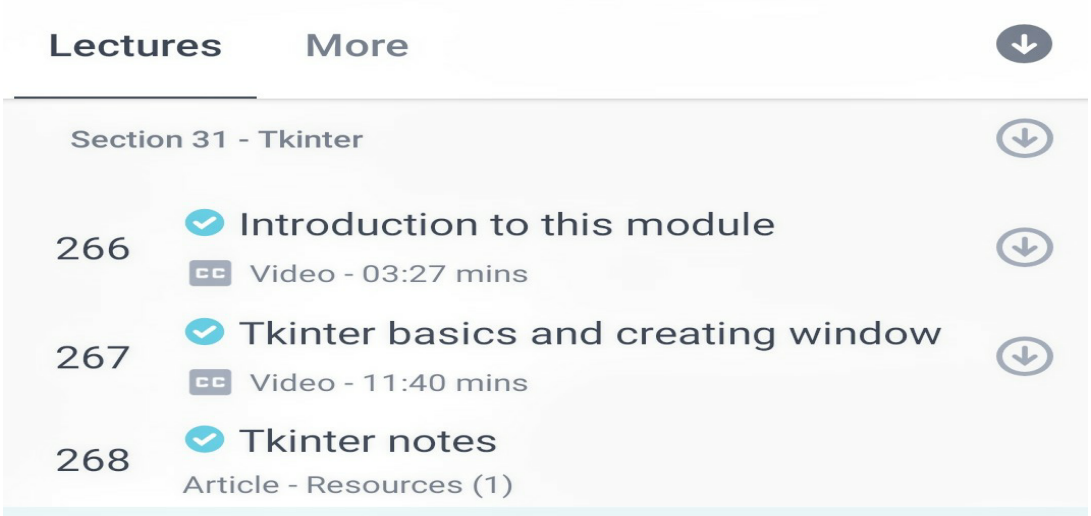


Date:	**27-05-2020**	**Name:**	**K Muthu**
Course:	**Python Bootcamp 2020 build 15 working applications and Games**	**USN:**	**4al17ec038**
Topic:	Graphical User Interfaces with Tkinter	**Semester & Section:**	**6 & 'A'**

AFTERNOON SESSION DETAILS

Image of session





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Graphical User Interfaces with Tkinter :

- Python provides various options for developing graphical user interfaces (GUIs). Most important are Tkinter, wxPython, JPython.
- **Tkinter** is the standard GUI library for Python.
- Python when combined with Tkinter provides a fast and easy way to create GUI applications.
- Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.
- Steps involved in creating a GUI application using Tkinter are,
  - ✓ Import the Tkinter module.
  - ✓ Create the GUI application main window.
  - ✓ Add one or more of the above-mentioned widgets to the GUI application.
  - ✓ Enter the main event loop to take action against each event triggered by the user.
- Tkinter provides various controls, such as buttons, labels and text boxes used in a GUI application.
- These controls are commonly called widgets.
- There are currently 15 types of widgets in Tkinter.