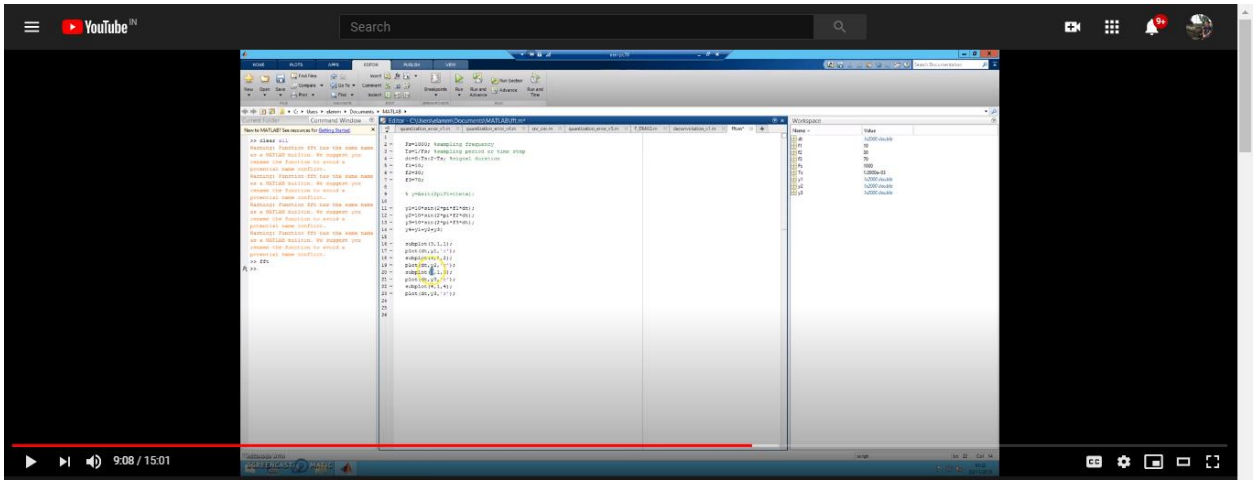
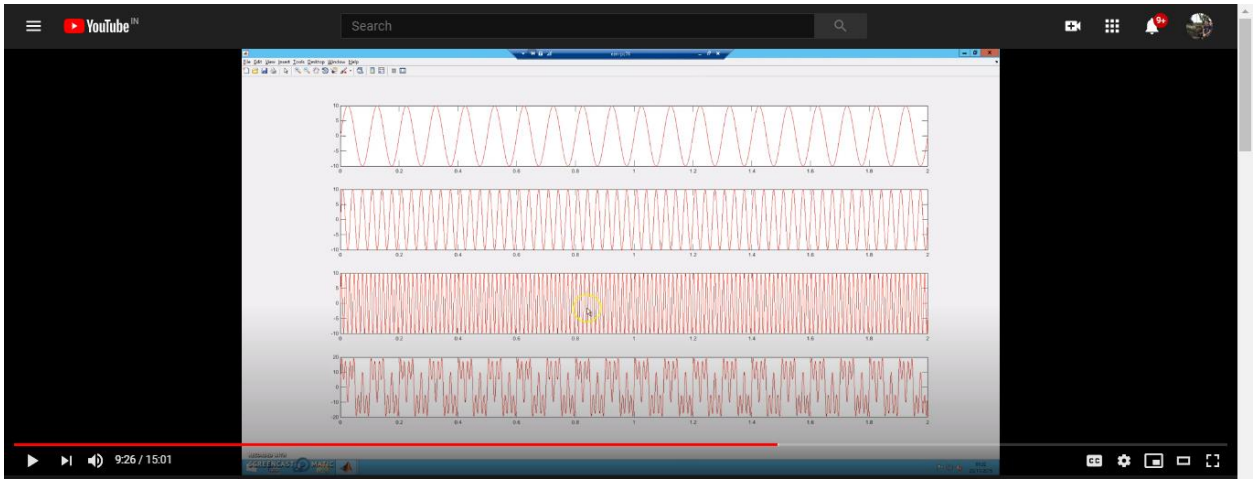
DAILY ASSESSMENT

Date:	27-May-2020	Name:	Swastik R Gowda
Course:	Digital Signal Processing	USN:	4AL17EC091
Topic:	❖ Fast Fourier Transforms ❖ FIR and IIR Filters ❖ Implementation of signal Filtering signal using WT in Matlab ❖ Short-time Fourier Transform and the Spectogram ❖ Welch's method and windowing	Semester & Section:	6th Sem 'B' Sec
Github Repository:	swastik-gowda		

FORENOON SESSION DETAILS

Image of session





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- **FFT:** A **fast Fourier transform** (**FFT**) is an algorithm that computes the discrete **Fourier transform** (DFT) of a sequence, or its inverse (IDFT). **Fourier** analysis converts a signal from its original domain (often time or space) to a representation in the frequency domain and vice versa.

- **FFT IN MATLAB:**

```
m = length(whaleMoan);
n = pow2(nextpow2(m));
y = fft(whaleMoan,n);
f = (0:n-1)*(fs/n)/10;
power = abs(y).^2/n;
plot(f(1:floor(n/2)),power(1:floor(n/2)))
xlabel('Frequency')
ylabel('Power')
```

- **FIR and IIR Filters:**

In signal processing, a finite impulse response (**FIR**) **filter** is a **filter** whose impulse response (or response to any finite length input) is of finite duration, because it settles to zero in finite time.

- Infinite impulse response is a property applying to many linear time-invariant systems that are distinguished by having an impulse response h which does not become exactly zero past a certain point, but continues indefinitely.

- **FDA tool in matlab:**

Infinite impulse response is a property applying to many linear time-invariant systems that are distinguished by having an impulse response h which does not become exactly zero past a certain point, but continues indefinitely.

- **Introduction to WT,CWT and DWT:**

In mathematics, a wavelet series is a representation of a square-integrable function by a certain orthonormal series generated by a wavelet.

- The wavelets in the CWT and nondecimated discrete wavelet transform are technically called frames, they are linearly-dependent sets. The DWT is not shift-invariant. Because the DWT downsamples, a shift in the input signal does not manifest itself as a simple equivalent shift in the DWT coefficients at all levels.

- A **spectrogram** is a visual representation of the spectrum of frequencies of a signal as it varies with time. When applied to an audio signal, spectrograms are sometimes called sonographs, voiceprints, or voicegrams.

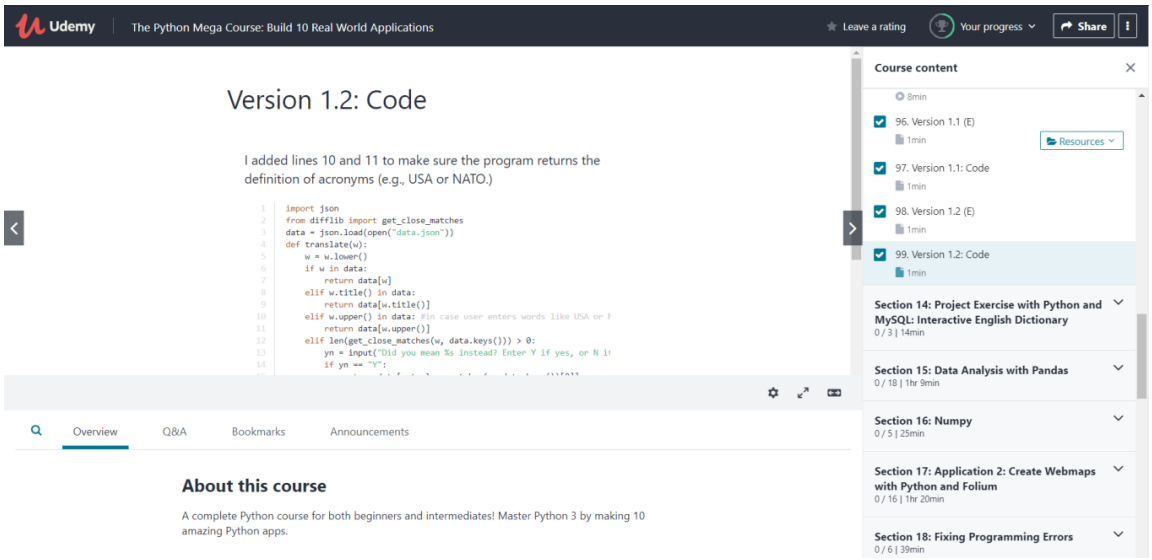
- **Welch's method** (also called the periodogram method) for estimating power spectra is carried out by dividing the time signal into successive blocks, forming the periodogram for each block, and averaging. is the rectangular window, the periodograms are formed from non-overlapping successive blocks of data.

Since **ECG signals** are very noisy, usually 50Hz noise, **MATLAB** was used to test and adjust a digital filter [4], in order to obtain a good QRS complex, which represents the ventricular depolarization in the **ECG**, i.e., it shows the electrical impulse of heart as it passes through the ventricles.

Date:	27-May-2020	Name:	Swastik R Gowda
Course:	PYTHON	USN:	4AL17EC091
Topic:	❖ Imported Modules ❖ Application 1: Build an Interactive English dictionary	Semester & Section:	6th Sem 'B' Sec

AFTERNOON SESSION DETAILS

Image of session



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Imported Modules:

- **Builtin objects** are all objects that are written inside the Python interpreter in C language.
- **Builtin modules** contain builtins objects.
- Some builtin objects are not immediately available in the global namespace. They are parts of a builtin module. To use those objects the module needs to be **imported** first. E.g.:

```
import time
time.sleep(5)
```

- **A list of all builtin modules** can be printed out with:

```
import sys
sys.builtin_module_names
```

- **Standard libraries** is a jargon that includes both builtin modules written in C and also modules written in Python.

- **Standard libraries** written in Python reside in the Python installation directory as *.py* files. You can find their directory path with sys.prefix.

- **Packages** are a collection of *.py* modules.

- **Third-party libraries** are packages or modules written by third-party persons (not the Python core development team).

Application 1: Build an Interactive English Dictionary

- The session made building of a dictionary very simple, the concepts of accessing a file like opening and reading were practically implemented.

- The concept of importing modules and finding out the existing libraries to make out work simple and easy was one of the goals of this section.

- The concept of nested conditional statements was put in to practice. A simple yet effective program to implement a dictionary through the command line.