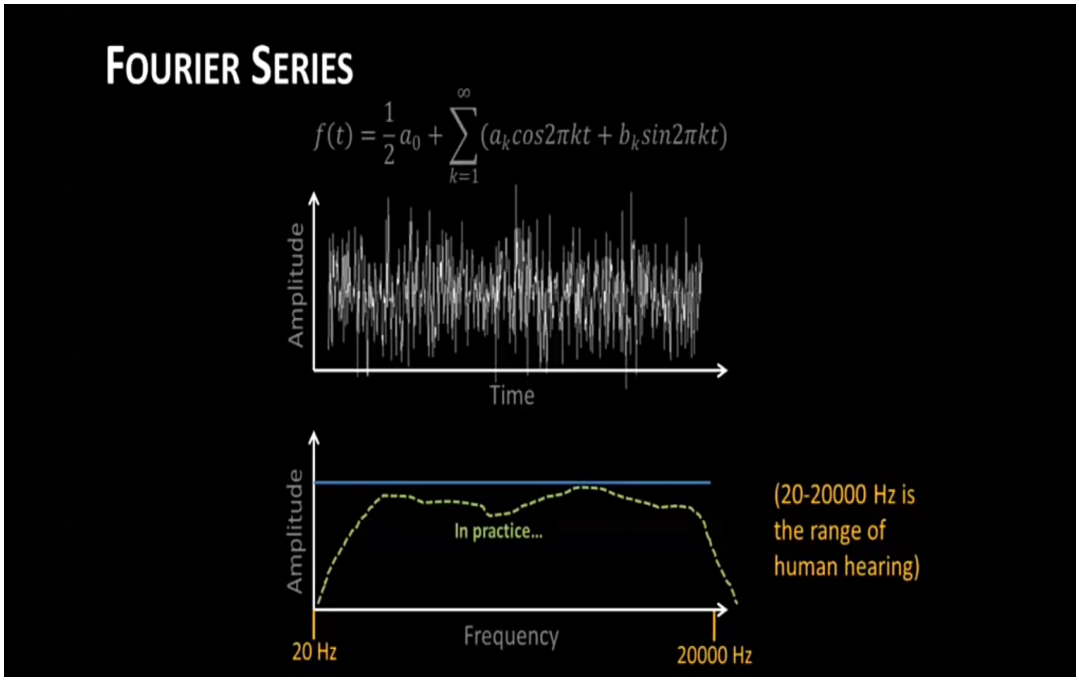
DAILY ASSESSMENT FORMAT

Date:	25/5/2020	Name:	Nichenametla Bhargavi
Course:	Digital Signal Processing	USN:	4AL17EC061
Topic:	Fourier Series	Semester & Section:	6th Sem A Sec
Github Repository:	alvas-education-foundation/Bhargavi_Nichenametla		

FORENOON SESSION DETAILS
Image of session



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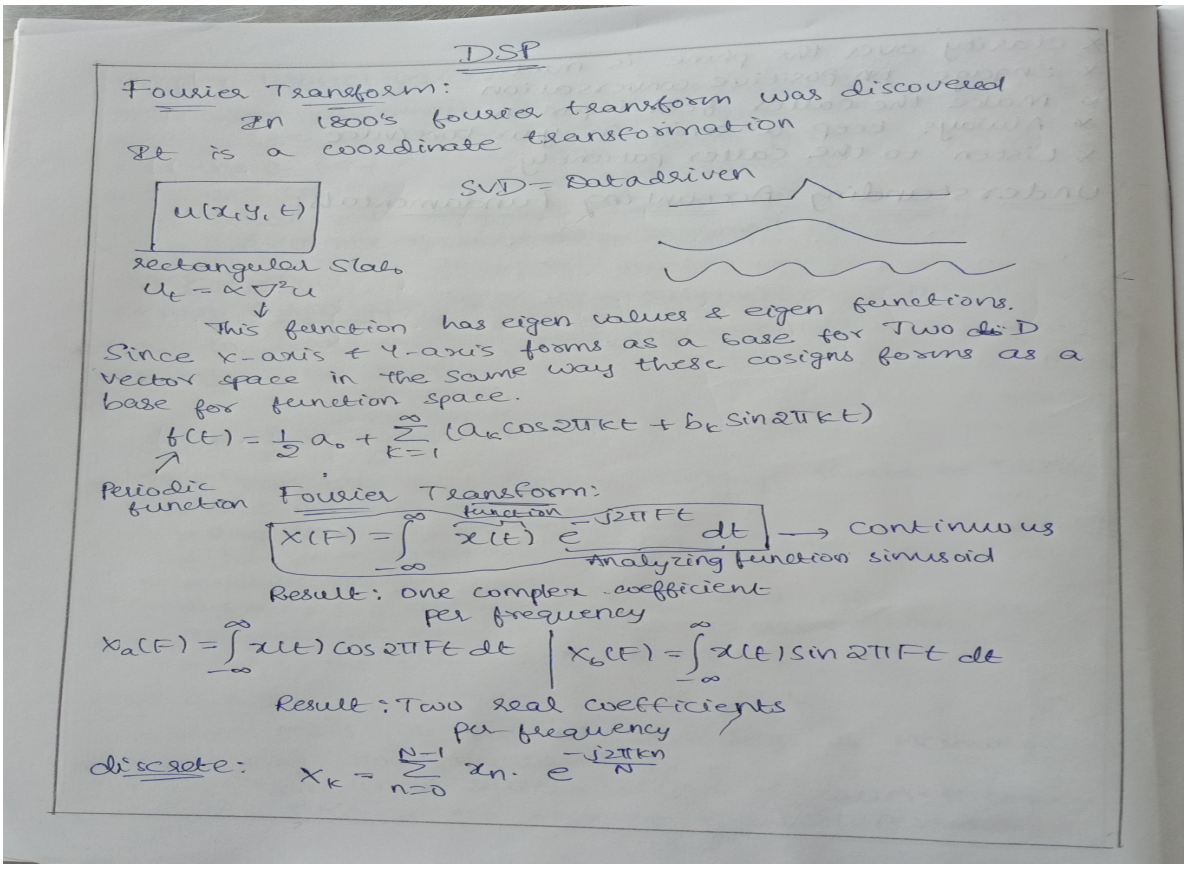


DSP

Fourier Transform:

In 1800's fourier transform was discovered

It is a coordinate transformation

$u(x,y,t)$

rectangular Slab

$u_t = \alpha \nabla^2 u$

SVD = Data driven

This function has eigen values & eigen functions.

Since x-axis & y-axis forms as a base for Two D vector space in the same way these cosigns forms as a base for function space.

$$f(t) = \frac{1}{2}a_0 + \sum_{k=1}^{\infty}(a_k \cos 2\pi kt + b_k \sin 2\pi kt)$$

Periodic function

Fourier Transform:

$$X(F) = \int_{-\infty}^{\infty} \underbrace{x(t)}_{\text{function}} \; e^{-j2\pi Ft} \; dt$$

$e^{-j2\pi Ft}$: Analyzing function sinusoid

$\longrightarrow$ Continuous

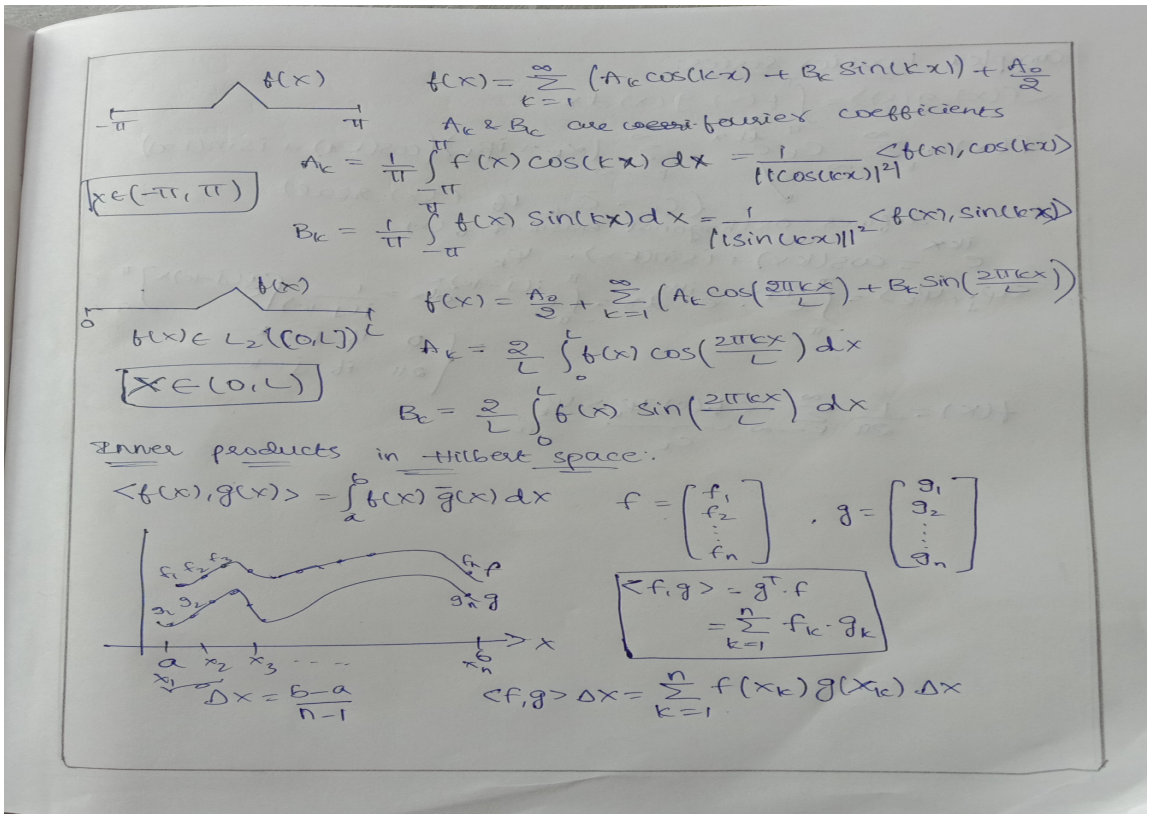
Result: one complex coefficient per frequency

$$X_a(F) = \int_{-\infty}^{\infty} x(t)\cos 2\pi Ft \, dt \qquad X_b(F) = \int_{-\infty}^{\infty} x(t)\sin 2\pi Ft \, dt$$

Result: Two real coefficients per frequency

discrete:

$$X_k = \sum_{n=0}^{N-1} x_n \cdot e^{\frac{-j2\pi kn}{N}}$$



$f(x)$, $x \in (-\pi, \pi)$

$$f(x) = \sum_{k=1}^{\infty}(A_k \cos(kx) + B_k \sin(kx)) + \frac{A_0}{2}$$

A_k & B_k are fourier coefficients

$$A_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\cos(kx)\,dx = \frac{1}{\|\cos(kx)\|^2}\langle f(x), \cos(kx)\rangle$$

$$B_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\sin(kx)\,dx = \frac{1}{\|\sin(kx)\|^2}\langle f(x), \sin(kx)\rangle$$

$f(x)$, $f(x) \in L_2([0,L])$, $x \in (0,L)$

$$f(x) = \frac{A_0}{2} + \sum_{k=1}^{\infty}\left(A_k \cos\left(\frac{2\pi kx}{L}\right) + B_k \sin\left(\frac{2\pi kx}{L}\right)\right)$$

$$A_k = \frac{2}{L}\int_0^L f(x)\cos\left(\frac{2\pi kx}{L}\right)dx$$

$$B_k = \frac{2}{L}\int_0^L f(x)\sin\left(\frac{2\pi kx}{L}\right)dx$$

Inner products in Hilbert space.

$$\langle f(x), g(x)\rangle = \int_a^b f(x)\,\bar{g}(x)\,dx$$

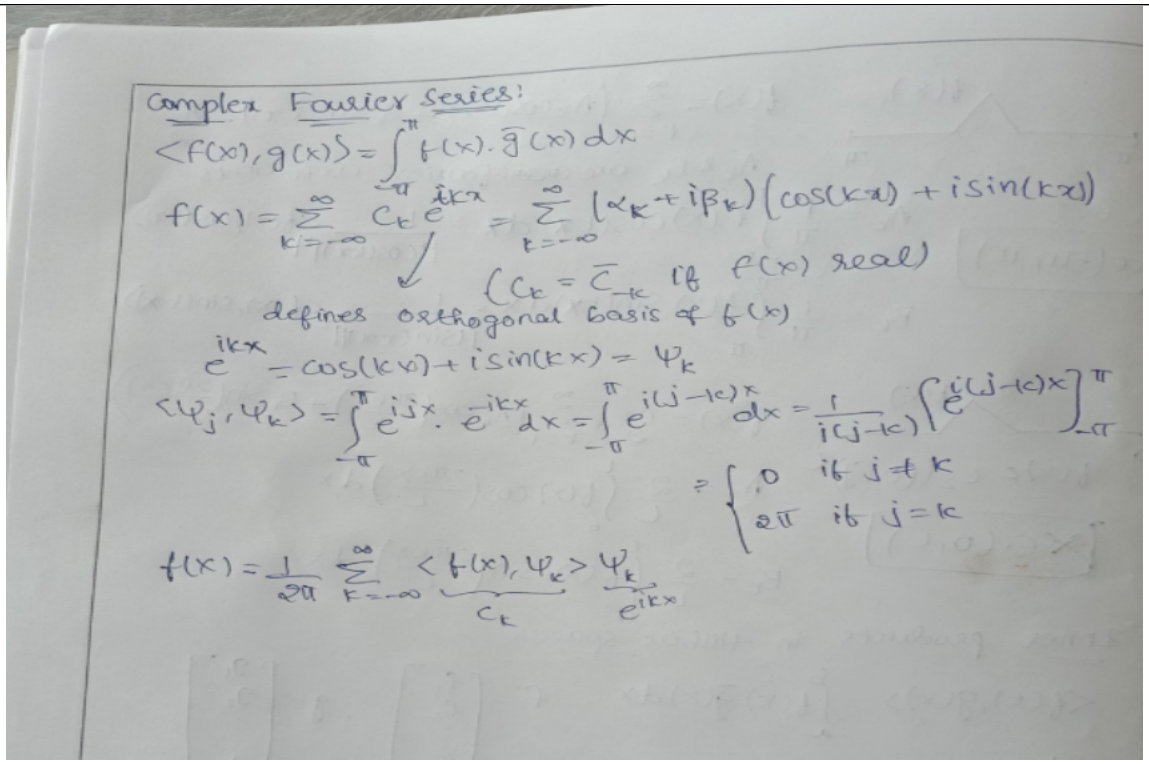
$$f = \begin{bmatrix} f_1 \\ f_2 \\ \vdots \\ f_n \end{bmatrix}, \quad g = \begin{bmatrix} g_1 \\ g_2 \\ \vdots \\ g_n \end{bmatrix}$$

$$\langle f, g\rangle = g^T \cdot f = \sum_{k=1}^{n} f_k \cdot g_k$$

$a, x_2, x_3, \ldots, b$

$$\Delta x = \frac{b-a}{n-1}$$

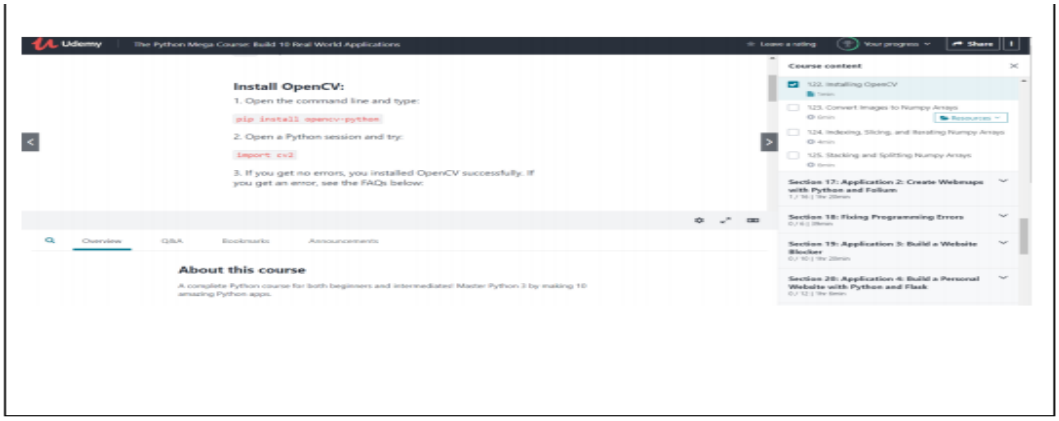
$$\langle f, g\rangle \Delta x = \sum_{k=1}^{n} f(x_k)\,g(x_k)\,\Delta x$$



Date:	**22/05/2020**	**Name:**	**Nichenametla Bhargavi**
Course:	**Python Bootcamp 2020 build 15 working applications and Games**	**USN:**	**4AL17EC061**
Topic:	**Application 1:Build an Interactive English dictionary**	**Semester & Section:**	**6th Sem A sec**

AFTERNOON SESSION DETAILS

Image of session



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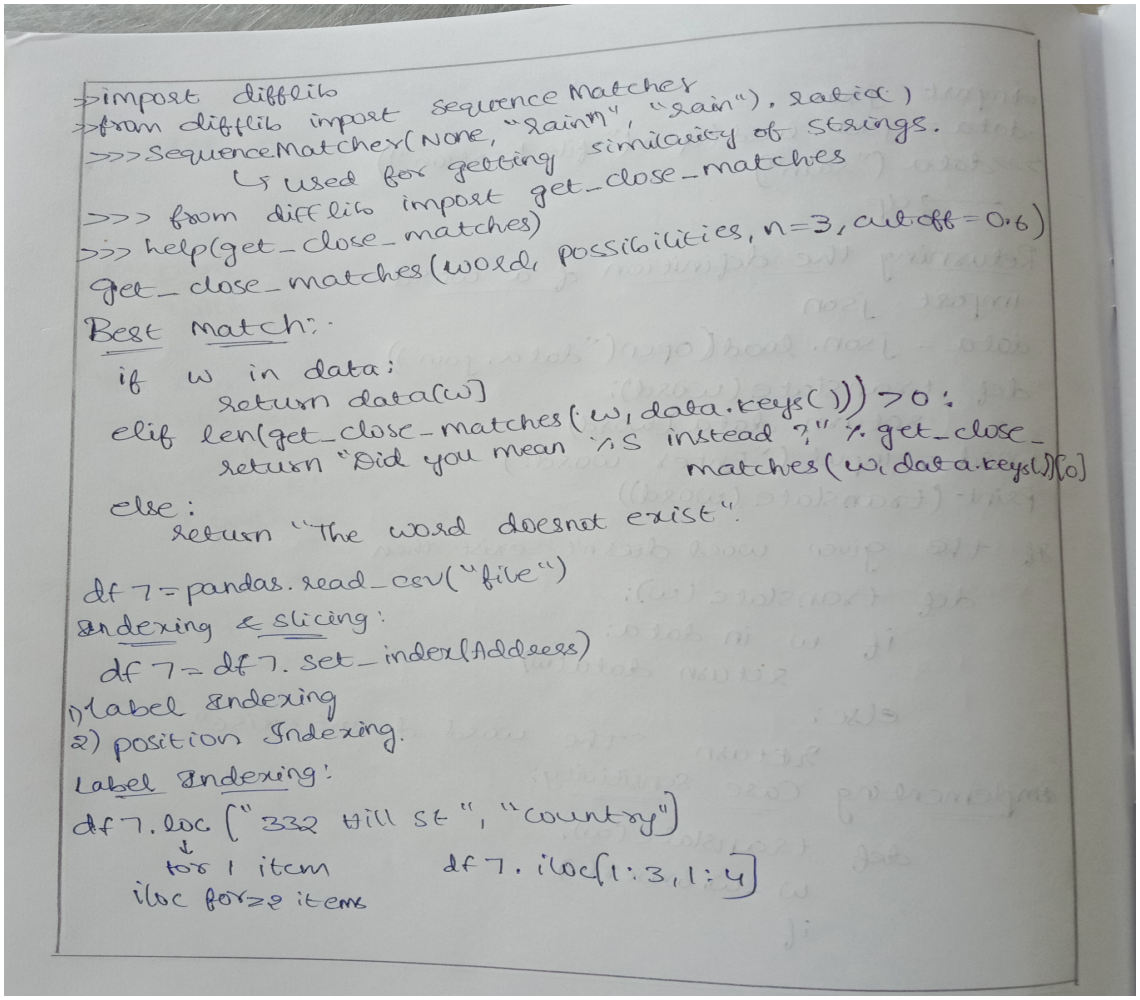

Numpy:

1. What is Numpy?

2. Numpy is the fundamental package for scientific computing in Python.

3. It is a Python library that provides a multidimensional array object, various derived objects

4. At the core of the Numpy package, is the ndarray object. This encapsulates-dimensional arrays of homogeneous data types, with many operations being performed in compiled code for performance.

5. The value '0'is passed when read operation is performed on the image to give gray scale pixel values of the image.

6. The value '1'is passed when read operation is performed on the image to give Blue, Green, Red(BGR)pixel values of the image respectively.