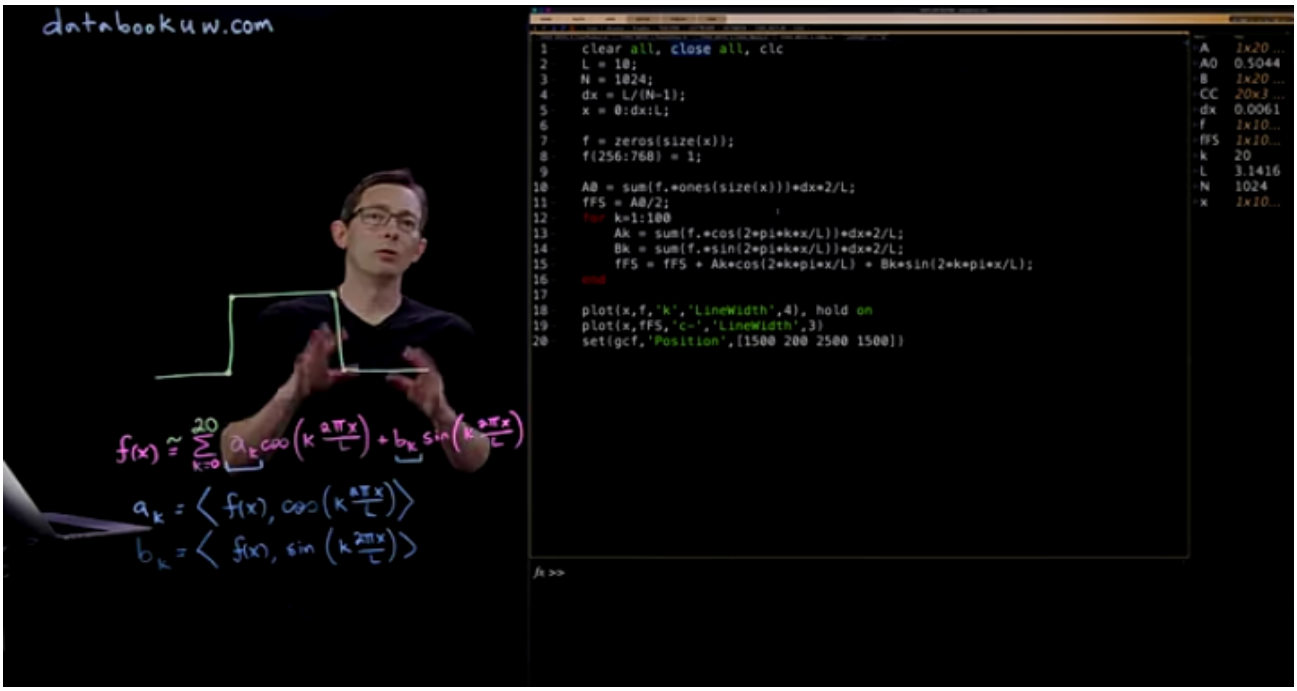
DAILY ASSESSMENT FORMAT

Date:	25/05/2020	Name:	Akshatha M Deshpande
Course:	DSP	USN:	4AL17EC006
Topic:	Fourier series and Fourier transform	Semester & Section:	6th Sem A sec
Github Repository:	AkshathaDeshpande		

FORENOON SESSION DETAILS
Image of session



Report – Report can be typed or hand written for up to two pages.

Introduction to fourier series & fourier transform :

In 1800's fourier transform was discovered.
It is a coordinate transform.

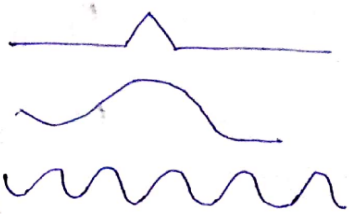
$u(x, y, t)$

rectangular slab

$u_t = \alpha \nabla^2 u$

↳ function

SVD = Data driven.



∇^2 -> This function has eigan values and 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.

$$f(t) = \frac{A_0}{2} + \sum_{k=1}^{\infty} (a_k \cos 2\pi k t + b_k \sin 2\pi k t)$$

Fourier Transform :-

In continous fourier transform we multiply function with an analytic signal & we get one complex coefficient per frequency. $X(F) = \int_{-\infty}^{\infty} x(t)\, e^{-j2\pi f t}\, dt$ (efficient one).

If we corelate with cos or sin function then the result gives two real coefficients per frequency.

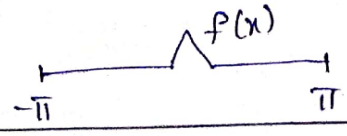
In discrete fourier transform :-

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

Here we use euler's formula,

$$e^{jx} = \cos x + j \sin x$$

For fourier series also.



Fourier Series :-

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

A_k & B_k are fourier coefficients.

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

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

Inner products in Hilbert space :-

$$\langle f(x), g(x) \rangle = \int_0^b f(x) \bar{g}(x)\, dx.$$

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

Complex Fourier Series :-

$$f(x) = \sum_{k=-\infty}^{\infty} c_k e^{ikx}$$

$$= \sum_{k=-\infty}^{\infty} (\alpha_k + i\beta_k)(\cos(kx) + i\sin(kx))$$

$c_k = \bar{c}_k$ if $f(x)$ real.

This defines the orthogonal basis of $f(x)$.

$$e^{ikx} = \cos(kx) + i\sin(kx) = \psi_k$$

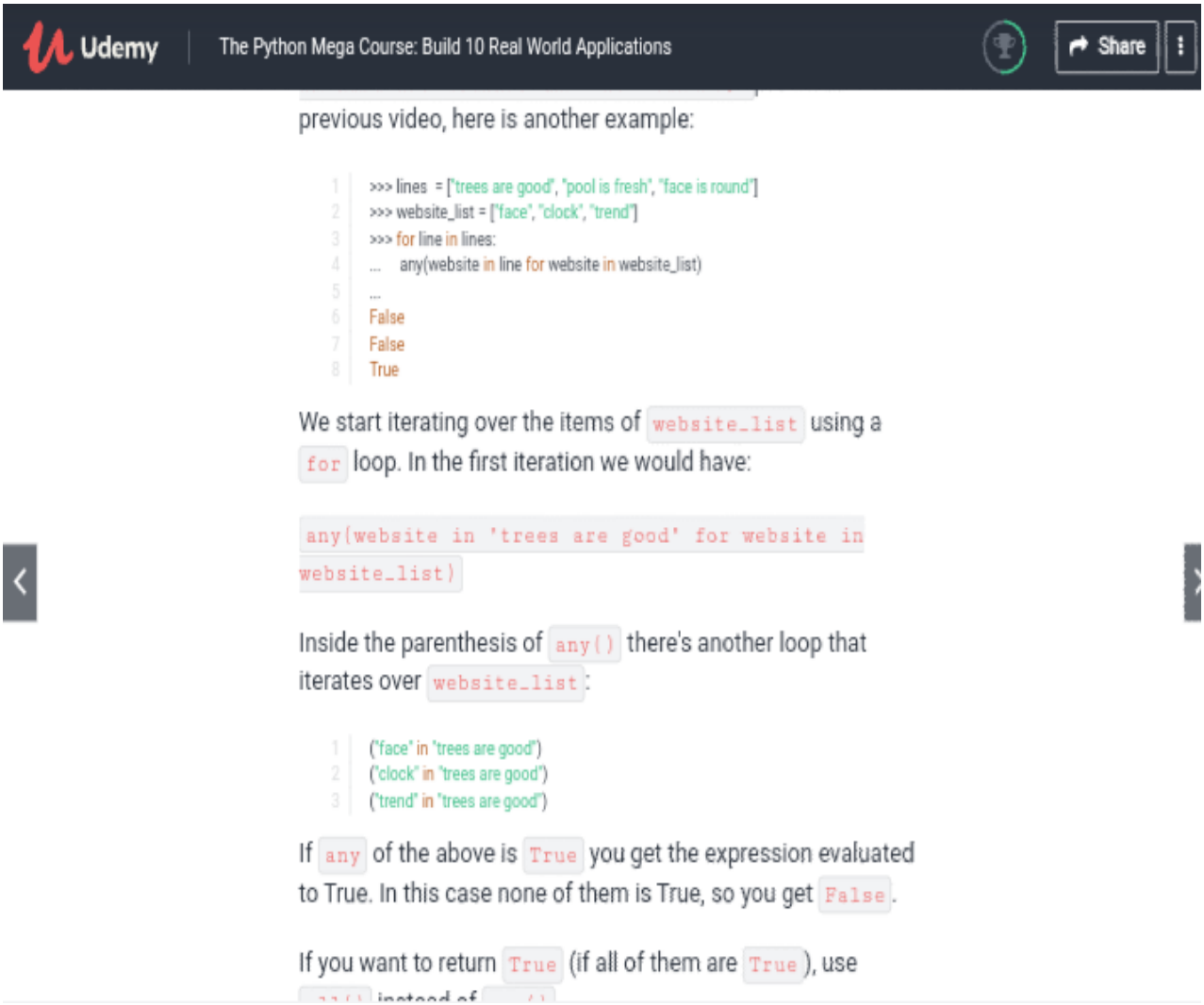
$$f(x) = \frac{1}{2\pi} \sum_{k=-\infty}^{\infty} \underbrace{\langle f(x), \psi_k \rangle}_{c_k} \underbrace{\psi_k}_{e^{ikx}}.$$

Coding of fourier series was explained using Matlab, python and octave.

Date:	25/05/2020	Name:	Akshatha M Deshpande
Course:	Python	USN:	4AL17EC006
Topic:	Fixing program errors, Application 3	Semester & Section:	6th Sem A sec

AFTERNOON SESSION DETAILS

Image of session



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Fixing programming Errors :-

* To fix the syntax errors
* To fix the runtime errors.
* How to fix difficult errors.
* Questions on good programming.
* Error handling

Application-3 :-

Build a website blocker

* How the output of the website blocker will look like
* Architecture of the Application.
* This application is implemented in two parts.
* Setting up the script.
* Setting up the infinite loop.
* First part implementation of the program.
* Second part implementation of the program.
* Using `any()` function.
* Sheduling techniques on windows, mac & linux
* Scheduling techniques on a Server.