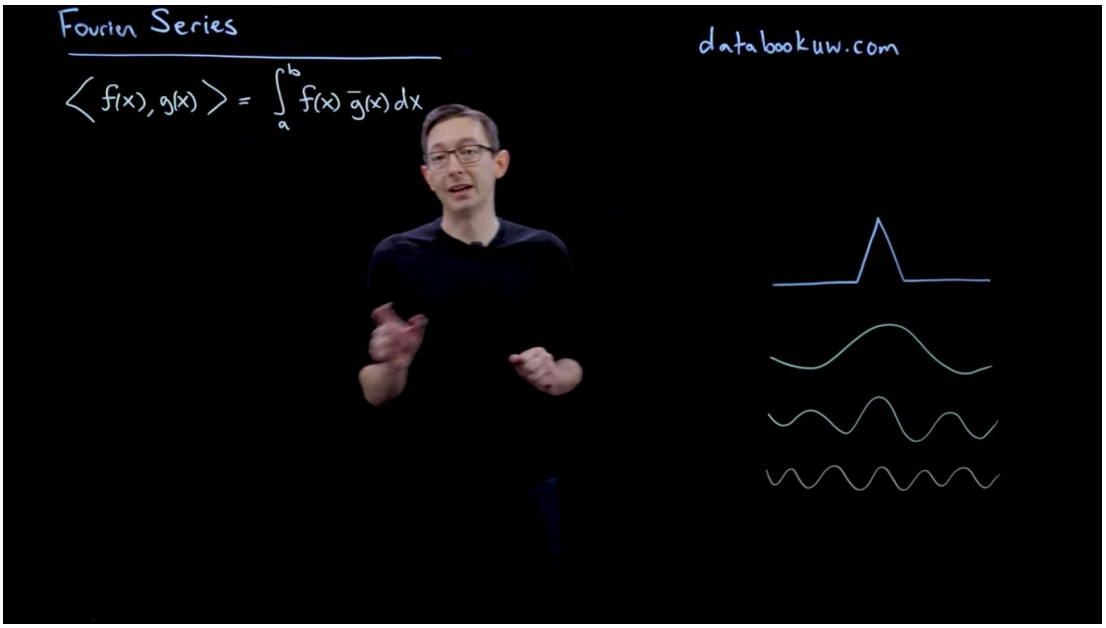
DAILY ASSESSMENT FORMAT

Date:	**25-05-2020**	**Name:**	**K B Kushi**
Course:	**Digital signal processing**	**USN:**	**4AL17EC107**
Topic:	**Python Exercise**	**Semester & Section:**	**6TH & B**
Github Repository:	**https://github.com/alvas-education-foundation/KUSHI-COURSES.git**		

FORENOON SESSION DETAILS
Image of session

Report –

Fourier Transform

- Coordinate transform –
  for sequencing images, matrices.
- $y_t = \alpha \nabla^2 u$ – partial d.E

SVD: Data-driven FFT

– Fast fourier Transform
- images, videos etc are compressed by FFT
- 2D clips, audio compression

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

Fourier transform

$$X(F) = \int_{-\infty}^{\infty} x(t)\, e^{-j2\pi F t}\, dt$$

(108)

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

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

continuous $X(f) = \int_{-\infty}^{\infty} x(t)\, e^{-j2\pi f t}\, dt$

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

$X_k = x_0 e^{-b_0 j} + x_1 e^{-b_1 j} + \cdots + x_n e^{-b_{N-1} j}$

Eulers formula

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

$X_k = x_0[\cos(-b_0) + j \sin(-b_0)] + \cdots$

$\boxed{X_k = A_k + B_k j}$

$mg = \sqrt{A_k^2 + B_k^2}$

$\theta = \tan^{-1}\left(\frac{B_k}{A_k}\right)$

Summary of chap 1

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

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

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

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

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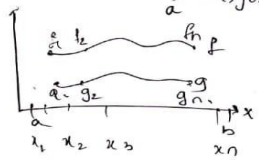
Inner product in Hilbert Spaces:

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



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

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

$$\langle f, g \rangle = g^T f = \boxed{g}\,\boxed{f}$$

$$= \sum_{k=1}^{n} f_k g_k$$

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

Complex Fourier Series

$$\langle f(x), g(x) \rangle = \int_{-\pi}^{\pi} f(x)\bar{g}(x)\,dx$$

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

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

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

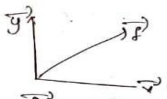
$(C_k = \overline{C_{-k}}$ if $f(x)$ is real$)$

$$\langle \varphi_j, \varphi_k \rangle = \int_{-\pi}^{\pi} e^{ijx} e^{-ikx}\,dx$$

$$= \int_{-\pi}^{\pi} e^{i(j-k)x}\,dx$$

$$= \frac{1}{i(j-k)} \left[e^{i(j-k)x} \right]_{-\pi}^{\pi}$$

$$= \begin{cases} 0 & \text{if } j \neq k \\ 2\pi & \text{if } j = k \end{cases}$$



$$\vec{f} = \langle \vec{f}, \vec{x} \rangle \vec{x} + \langle \vec{f}, \vec{y} \rangle \vec{y}$$

$$= \frac{1}{2\pi} \sum_{k=0}^{\infty} \frac{\langle f(x), \varphi_k \rangle \varphi_k}{C_k} \quad \varphi_k = e^{ikx}$$

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Fourier series using matlab

→ Define a domain from $-\pi$ to π

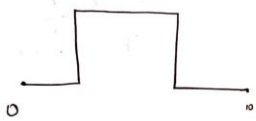
→ Define hat function.

$$f(x) = \sum_{k=1}^{\infty} a_k \cos\left(k\frac{2\pi x}{L}\right) + b_k \sin\left(k\frac{2\pi x}{L}\right)$$

$$a_k = \langle f(x), \cos\left(k\frac{2\pi x}{L}\right)\rangle$$

$$b_k = \langle f(x), \sin\left(k\frac{2\pi x}{L}\right)\rangle$$

Fourier Series and Gibbs phenomena



$$f(x) = \sum_{k=0}^{100} a_k \cos\left(k\frac{2\pi x}{L}\right) + b_k \sin\left(k\frac{2\pi x}{L}\right)$$

$$a_k = \langle f(x), \cos\left(k\frac{2\pi x}{L}\right)\rangle$$

$$b_k = \langle f(x), \sin\left(k\frac{2\pi x}{L}\right)\rangle$$

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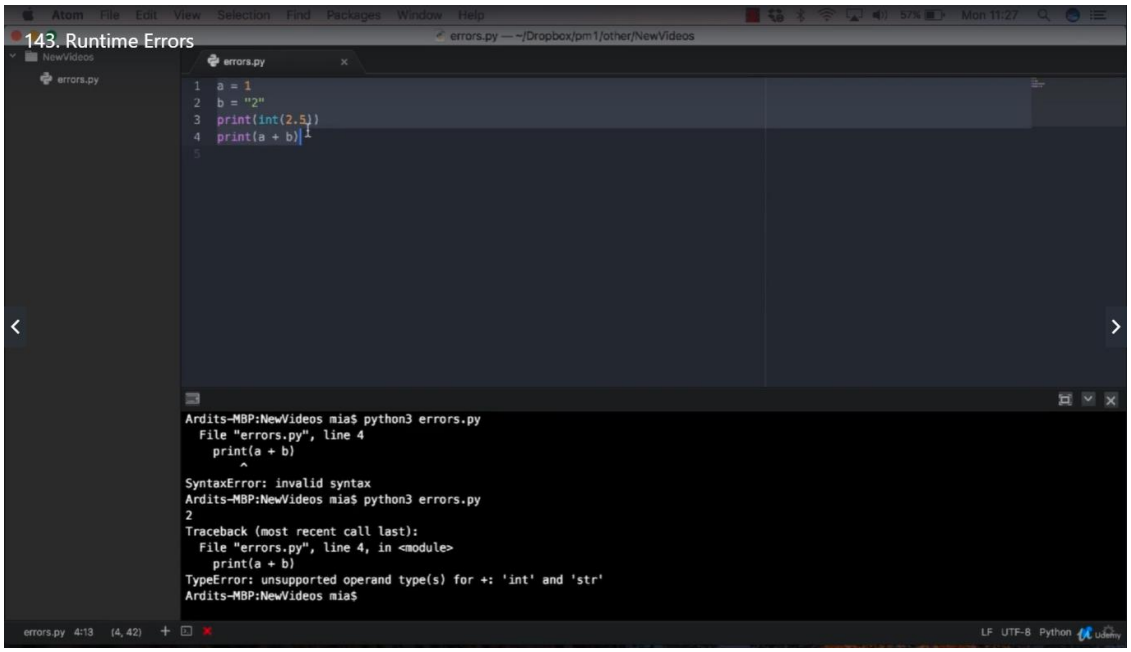
Date:	**25-05-2020**	**Name:**	**K B KUSHI**
Course:	**Python-Udemy**	**USN:**	**4AL17EC107**
Topic:	**1.Fixing programming errors 2.Application 3: Build a website blocker**	**Semester&Section:**	**6th & B**
Git hub repository -	**https://github.com/alvas-education-foundation/KUSHI-COURSES.git**		
AFTERNOON SESSION DETAILS			

Image of session



Report –

1.Fixing programming errors:

- **Invalid syntax: For example, we need to put proper parenthesis, indentations.**

"^ " indicates where the error is occurring.

- **Handling exceptions: occurs between the try and except keywords has been executed.**

- **Runtime error: Every other error which is not an invalid syntax error is a Runtime error. for example: divide by zero, type error, identifier error, traceback error.**

- **After this section, we learnt on how to ask proper questions on errors.**

- **To solve the runtime errors, we can copy paste the error onto the google or if the logic behind the error is known, it can be solved easily by ourselves.**

2.Application 3: Building a website blocker:

- **Python website blocker is to block some certain websites which can distract the user during the specified amount of time.**

- **Every system has host file whether it is Mac, Windows or Linux.**

  Host file in Mac and Linux: /etc/hosts

  Host file in Windows:C:\Windows\System32\drivers\etc

- **Using python file handling manipulation, we will write the hostname in hosts.txt and remove the lines after our working hours.**

- **Windows user need to create a duplicate of OS's host file. Now provide the path of the duplicate file in hosts_path mentioned in the script.**

- **After the scheduling process on different operating systems, there are certain set of steps to be followed on desktop to make the website blocker work.**

- **After the settings are completed the system has to get restarted. Finally, the website blocker works**.