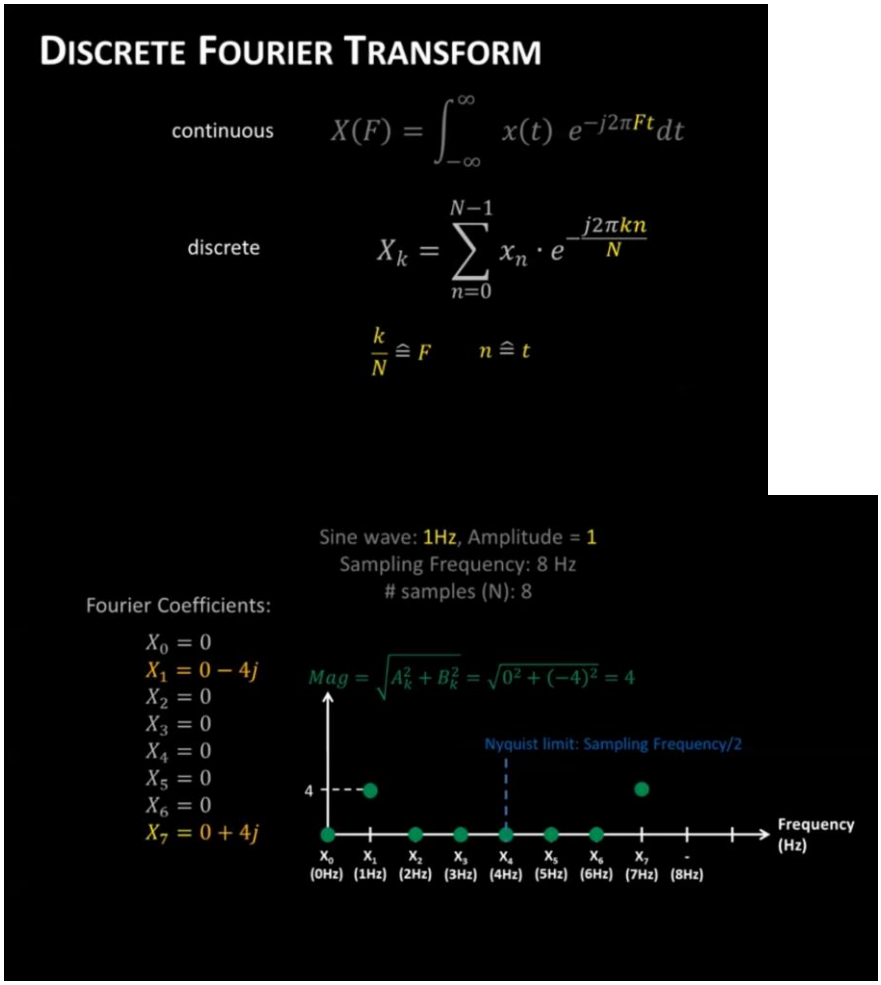
DAILY ASSESSMENT FORMAT

Date:	**25/05/2020**	**Name:**	**Lavanya B**
Course:	**Digital signal processing**	**USN:**	**4al17ec043**
Topic:	**Fourier transform and series**	**Semester & Section:**	**6th A**
Github Repository:	**Lavanya-B**		

FORENOON SESSION DETAILS

Image of session



Report –

27/07/2020

Fourier transform

It is a coordinate transform

Heat equation $u(x,y,z)$

$$\boxed{u_t = \kappa \nabla^2 u}$$

Fast Fourier Transform (FFT)

To compute Fourier series efficiently in a computer

Fourier series

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

Here a_k & b_k are coefficients

Fourier Transform

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

Result → one complex coefficient per frequency

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

Result → Two real coefficients per frequency

Discrete Fourier Transform

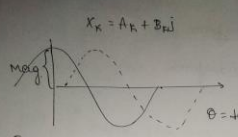
$$X_k = \sum_{n=0}^{N-1} x_n \cdot e^{-\frac{j2\pi kn}{N}}$$

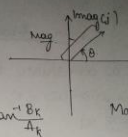
Euler's formula

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

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

$$X_k = A_k + B_k j$$





$$\theta = \tan^{-1}\frac{B_k}{A_k} \qquad Mag = \sqrt{A_k^2 + B_k^2}$$

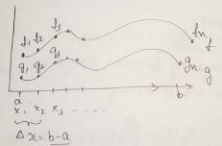
Fourier series

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

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

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

Inner products in Hilbert space.

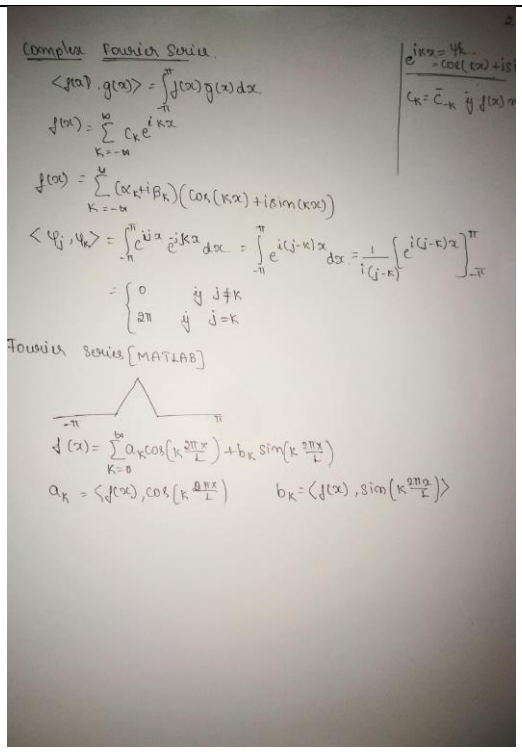


$$\langle f(x), g(x)\rangle = \int_a^b f(x)\bar{g}(x)\,dx$$

$$f = \begin{bmatrix} f_1 \\ f_2 \\ \vdots \\ f_n \end{bmatrix} \quad g = \begin{bmatrix} g_1 \\ g_2 \\ \vdots \\ g_n \end{bmatrix} \Rightarrow \langle f, g\rangle = g^T f = \boxed{g^T}\ \boxed{f}$$

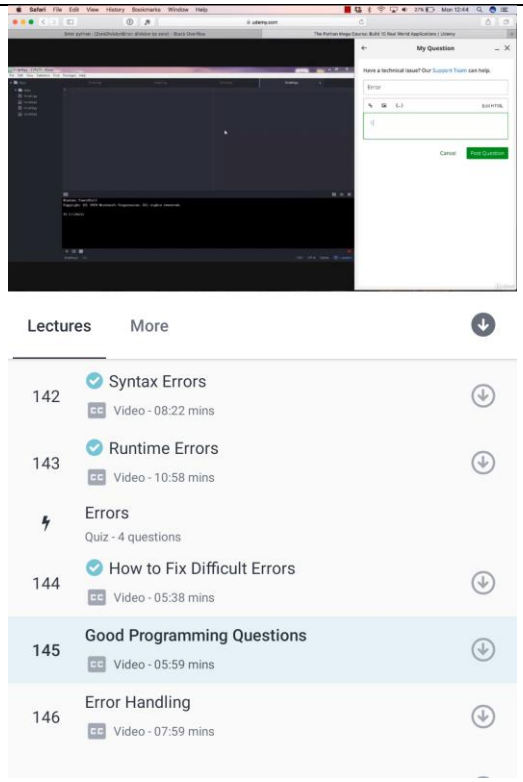
$$= \sum_{k=1}^{n} f_k g_k$$

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



Date:	**25/05/2020**	**Name:**	**Lavanya B**
Course:	**Python**	**USN:**	**4al17ec043**
Topic:	**Fixing programming errors**	**Semester & Section:**	**6th A**

AFTERNOON SESSION DETAILS
Image of session



Lectures More

142 Syntax Errors
Video - 08:22 mins

143 Runtime Errors
Video - 10:58 mins

Errors
Quiz - 4 questions

144 How to Fix Difficult Errors
Video - 05:38 mins

145 Good Programming Questions
Video - 05:59 mins

146 Error Handling
Video - 07:59 mins

Report –

Fixing programming errors

Types of errors

1. **Syntax errors**

```
Print(1)
Int(9)
Print(2)
a={1, 2, 3}
```

2. **Runtime errors**

In this session we learnt haw to fix Difficult errors

Error handling

```
a=1
b='2'
c=3
print (int(2,5))
print(c/0)
```

eg.,

```
def divide(a,b):
return a/b
print(divide(1,0))
```

error⇒Zero division error: division by zero