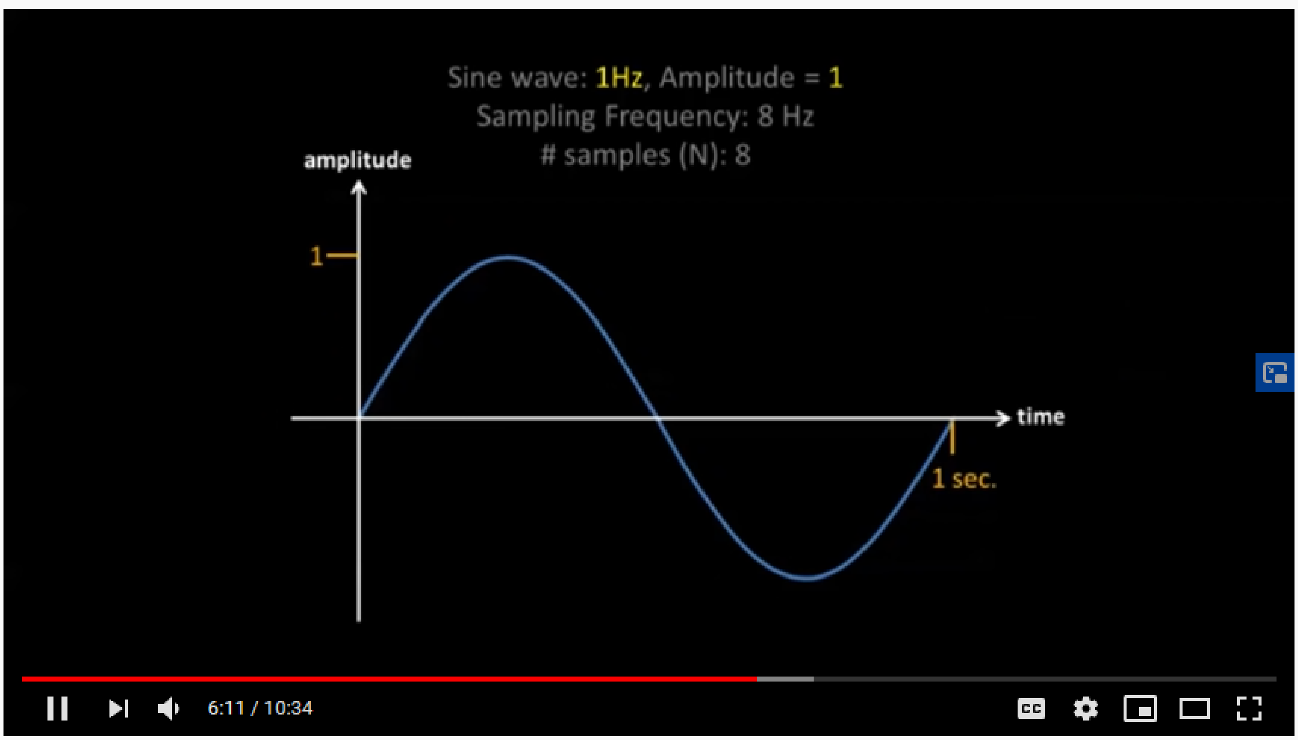
DAILY ASSESSMENT FORMAT

Date:	**25 may 2020**	**Name:**	**Nishanth**
Course:	**Digitial signal processing**	**USN:**	**4al17ec063**
Topic:	**1.Introduction to Fourier Series & Fourier Transform 2.Fourier Series – Part 1 3.Fourier Series – Part 2 4.Inner Product in Hilbert Transform 5.Complex Fourier Series. Fourier Series using MATLAB(Use Octave to execute the code) 6. Fourier Series using Python (Experience implementation using Python) 7. Fourier Series and Gibbs Phenomena Using MATLAB**	**Semester & Section:**	**6th & B**
Github Repository:	**nishanthvr**		

FORENOON SESSION DETAILS
Image of session



Discrete Fourier Transform - Simple Step by Step

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

Nishanth V.R
4NN17EC063

Subject

Digital Signal processing

(1) Introduction to fourier Series & fourier transform

databookow.com

fourier transform is a "coordinate form"

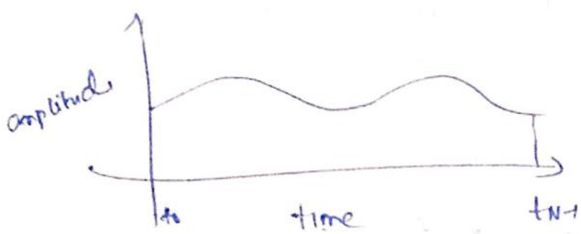
(FFT) fast fourier transform used in modern all processing activities

Fourier Series

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

fourier transform

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



discrete fourier transform

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

discrete

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

Evaluating at n to N

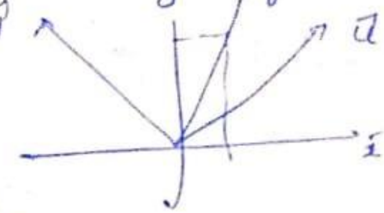
Fourier Series – part-1

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

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

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

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



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

$$= \langle \vec{f}\,\vec{u} \rangle \frac{\vec{u}}{|\vec{x}|} + \langle \vec{f}\,\vec{v} \rangle \frac{\vec{v}}{|\vec{v}|}$$

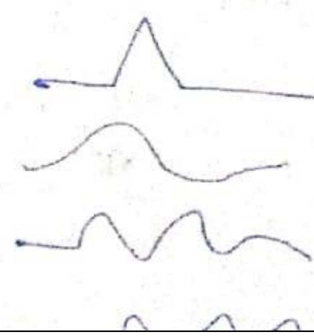
Fourier Series Part -2

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

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

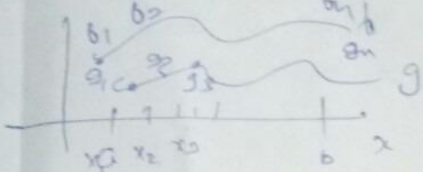
$$A_k = \frac{2}{L} \int_0^L f(x) \cos\left(\frac{2\pi k}{L} x\right) dx$$

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



Inner product in Hilbert Space

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



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

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

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

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

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

Complex fourier Series

$$f(x) = \sum_{k=-\infty}^{\infty} C_k e^{ikx} = \sum_{k=-\infty}^{\infty} (\alpha_k + i\beta_k)(\cos(kx) + i\sin(kx))$$

$$C_k = \bar{C}_{-k} \text{ if } f(x) \text{ real}$$

$$\langle \psi_j, \psi_k\rangle = \int_{-\pi}^{\pi} e^{ijx} e^{-ikx} dx = \int_{-\pi}^{\pi} e^{i(j-k)x} dx = \frac{1}{i(j-k)}\left[e^{i(j-k)x}\right]_{-\pi}^{\pi}$$

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

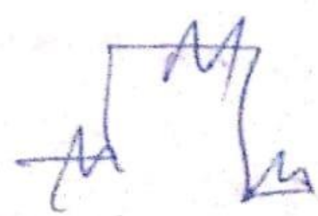
$$= \frac{1}{2\pi} \sum_{k=-\infty}^{\infty} \langle f(x), \psi_k\rangle \psi_k$$

Fourier Series (python)

```
import numpy as np
import matplot.psplot as plt
From matplotlibr.com input get_cmap

plt. reeaver get_cmp

# define domain

dx = 0+01
L = np.pi
x= L*np = arrange (-1+dx = 1+dx, dx )
n= len(x)
nsquit = int (np. floor (n/4)
```

Fourier Series & gibbs phenomen

```
Clear all
close all
L = 10
dx = 4(N+1)
x = 0: dx : l
f = zeros(3: 3(x)
f = (256 f : 768 ) : 1) ;
A0 = sum (g.x ones ( Sye( x1) x dx x 2 1 ;
f s = A0 2 ;
for k = 1:100
AK - Sum ( f x cos ( 2 x pi x L x x k) ) x dx y2k ;
SK = Sum ( f x x Sn(2 x pi x K x x/L) x dx x2K ;
f E1 = f F S + AK x cos (2 x K v pi x x/k) x BK + 2 (2 x px)
end
plot (x, f, r' 'Linewidth' u) hold on
plot (x. f 'K', 'Linewidth' B)
Set (x f . position, [1500, 200, 2500, 1500]
```

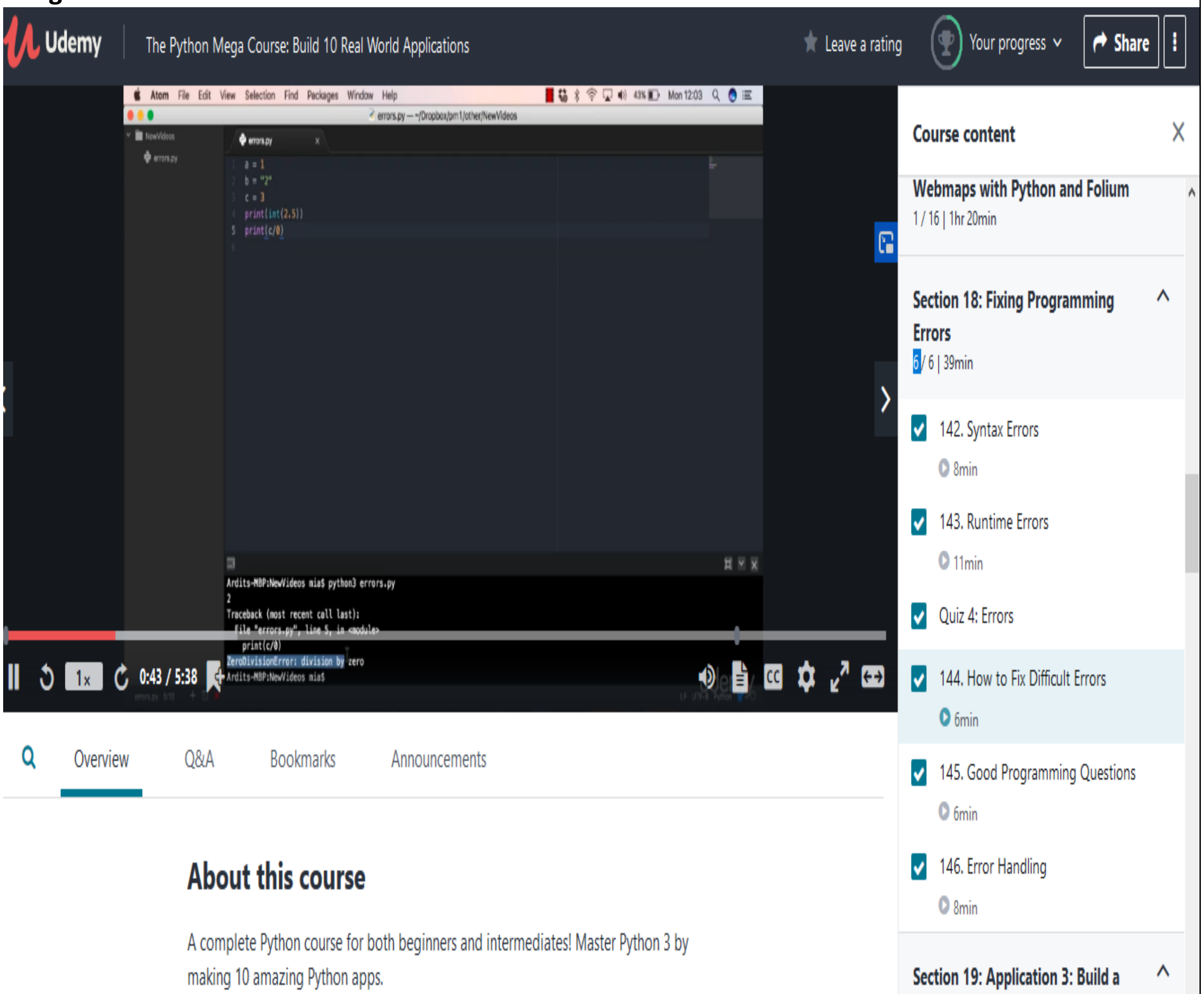


gibbs phenom

Date:	**25 may 2020**	**Name:**	**nishanth**
Course:	**python**	**USN:**	**4al17ec063**
Topic:	**Fixing programming error, Application 3 websites blocker**	**Semester & Section:**	**6^{th} & B**

AFTERNOON SESSION DETAILS

Image of session



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

Error handling

1.syntax error

In this I learn how to check the syntax error how we can identify that in python

2.Runtime error

3.error handling

Application 3 websites blocker:

Program:

```
Import time
From.datetime.import.datetime as dt
Hosts temp=r"D:\Dropbox\pp\blocks_websites\Demo\hosts"
Hosts.path="/etc/hosts"
Redirect="127.0.0.1"
Website_list=["www.facebook.com","facebook.com"."dub119.mail.live.com",www.dub119.mail.live.com]
                    Else:
                         File.write(redirect+"."+.website+"\n")
                Else:
                      With.open(hosts.math,'c+')as.file:
                          Content=file.file.readlines()
                            File.seek(0)
                           For line in content:
                               If not any(websites.in line for websites in website.lists):
                                      File.write(line)
                          File.truncate()
                         Print("fun.hours….")
                Time.sleep(5)
```