DAILY ASSESSMENT FORMAT

Date:	25-05-2020	Name:	M V Ramya
Course:	DSP	USN:	4AL17EC045
Topic:	Communication skills, Effective presentation and soft skills	Semester & Section:	6th sem, A sec
Github Repository:	M V Ramya-045		

FORENOON SESSION DETAILS


DIGITAL SIGNAL PROCESSING

Introduction to Fourier Series and Fourier Transform

- Fast Fourier Transform
- $f(t) = \frac{1}{2} a_0 + \sum_{k=1}^{\infty} (a_k \cos 2\pi k t + b_k \sin 2\pi k t)$
- Fourier transform :-

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

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

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

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

let $\frac{2\pi k n}{N} = bn$

$\therefore X_k = x_0 e^{-b0j} + x_1 e^{-b1j} + x_2 e^{-b2j} + \ldots\ldots$

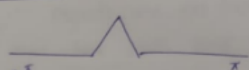
Euler's formula , $e^{jx} = \cos x + j \sin x$

after solving we get , $X_k = A_k + B_k j$

magnitude $= \sqrt{A_k^2 + B_k^2} \qquad \theta = \tan^{-1}\left(\frac{B_k}{A_k}\right)$

Fourier Series Part 1 :-

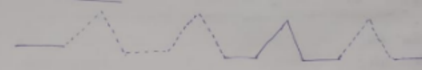
- $f(x)$



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

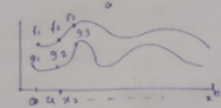
$$A_k = \frac{1}{\pi} \int^{\pi} f(x) \cos(kx)\, dx \qquad B_k = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \sin$$

Fourier Series Part - 2



Inner Product of Hilbert Space :-

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



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

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

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

Complex Fourier Series :-

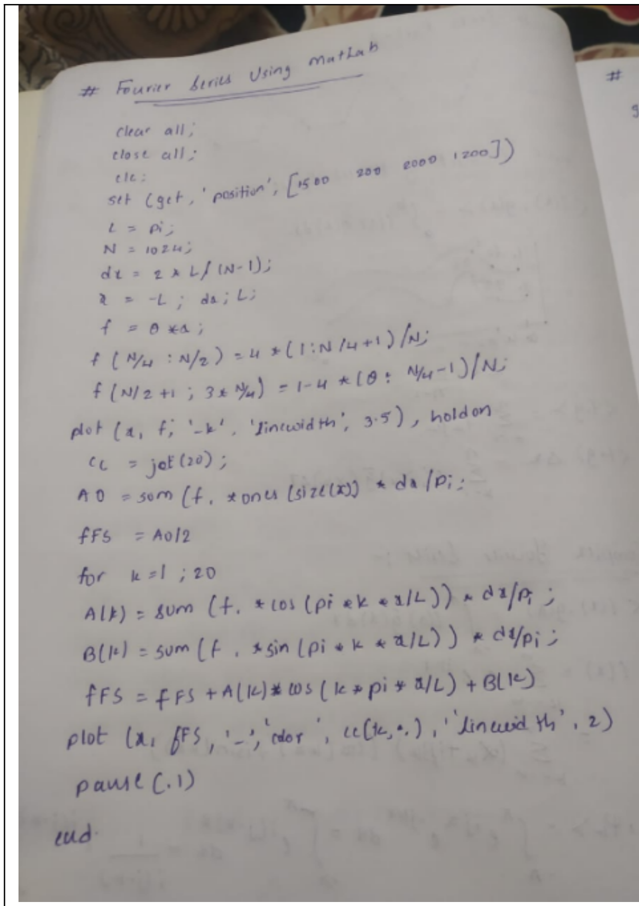
$$\langle f(x), g(x) \rangle = \int_{-\pi}^{\pi} f(x)\, \bar{g}(x)\, dx$$

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

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

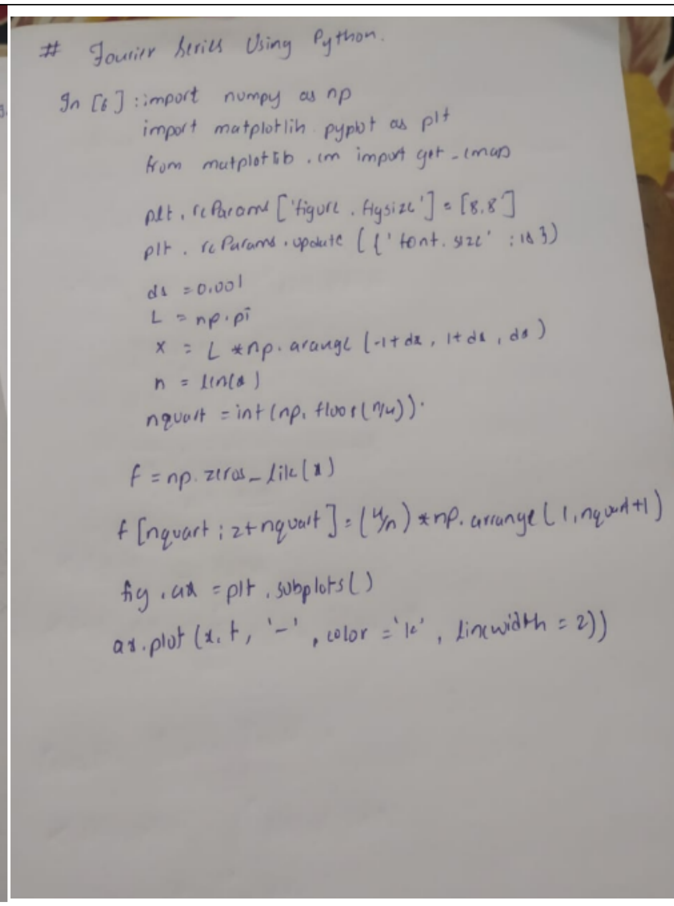
$$\langle \psi_j, \psi_k \rangle = \int_{-\pi}^{\pi} e^{ijx} e^{-jkx}\, dx = \int_{-\pi}^{\pi} e^{i(j-k)x}\, dx = \frac{1}{i(j-k)} e^{i(j-k)} \Big]_{-\pi}^{\pi}$$

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



```
# Fourier Series Using matlab

clear all;
close all;
clc;
set (gcf, 'position', [1500 200 2000 1200])
L = pi;
N = 1024;
dx = 2 * L/(N-1);
x = -L ; dx ; L;
f = 0 *x ;
f (N/4 : N/2) = 4 *(1:N/4+1)/N;
f (N/2 +1 ; 3* N/4) = 1-4 *(0 : N/4-1)/N;
plot (x, f, '-k', 'linewidth', 3.5), hold on
cc = jet(20);
A0 = sum (f. * ones (size(x)) * dx /pi;
fFS = A0/2
for k =1 ; 20
A(k) = sum (f. * cos (pi *k * x/L)) * dx/pi ;
B(k) = sum (f . * sin (pi * k * x/L)) * dx/pi ;
fFS = fFS + A(k)* cos ( k * pi * x/L) + B(k)
plot (x, fFS, '-', 'color', cc(k,:), 'linewidth', 2)
pause (.1)
end
```



```
# Fourier Series Using Python.

In [6] : import numpy as np
import matplotlib.pyplot as plt
from matplotlib.cm import get_cmap

plt.rcParams['figure.figsize'] = [8,8]
plt.rcParams.update ({'font.size' : 18})

dx = 0.001
L = np.pi
x = L * np.arange (-1+dx, 1+dx, dx)
n = len(x)
nquart = int (np.floor(n/4)).

f = np.zeros_like(x)
f [nquart ; 2*nquart] = (4/n) * np.arange (1, nquart+1)

fig, ax = plt.subplots()
ax.plot (x, f, '-', color = 'k', linewidth = 2))
```

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Course: python	USN:4AL17EC045
Topic: Basics	Semester & Section: 6th sem Asec

AFTERNOON SESSION DETAILS
Image of session

25/05/2020

Python

Fixing Programming Errors :-

-> Syntax error

```
print (1)
int (9)
print (2)
print (3)
```

Int is a function in python,
∴ 9 should be enclosed in bracket
& even print

O/P :- File "errors.py", line 3
int 9
invalid syntax.

-> Exceptions :-

```
a =1
b ="2"
print(int(2.5))
print (a+b)
```

we get errorh at print (a+b) but we got the error due to previous line i.e print int (2.5) here we are missing the print closing bracket

- How fix error if we don't understand the message just copy the instruction & search in google

* Application 3 :- Build a website Blocker

Program architecture

windows ; c:\windows\systems 3.\devices\etc.

* Setting up the infinite loop

```
while True ;
if dt (dt.now().year,dt.now().mǒth,dt.now.day8)
< dt.now() <dt.now()year.dt.now().month,dt.now()
                                              day 16
print ("working hours ----")
else
 print ("fun hours ---')
 time.sleep(3).
```