DAILY ASSESSMENT FORMAT

Date:	26-05-2020	Name:	K Muthu
Course:	**Digital Signal Processing**	USN:	4al17ec038
Topic:	Fourier Series & Gibbs Phenomena using Python Fourier Transform Derivative Laplace Transform Application of z-transorm	**Semester & Section:**	6 & 'A'
Github Repository:	**K.Muthu-courses**		

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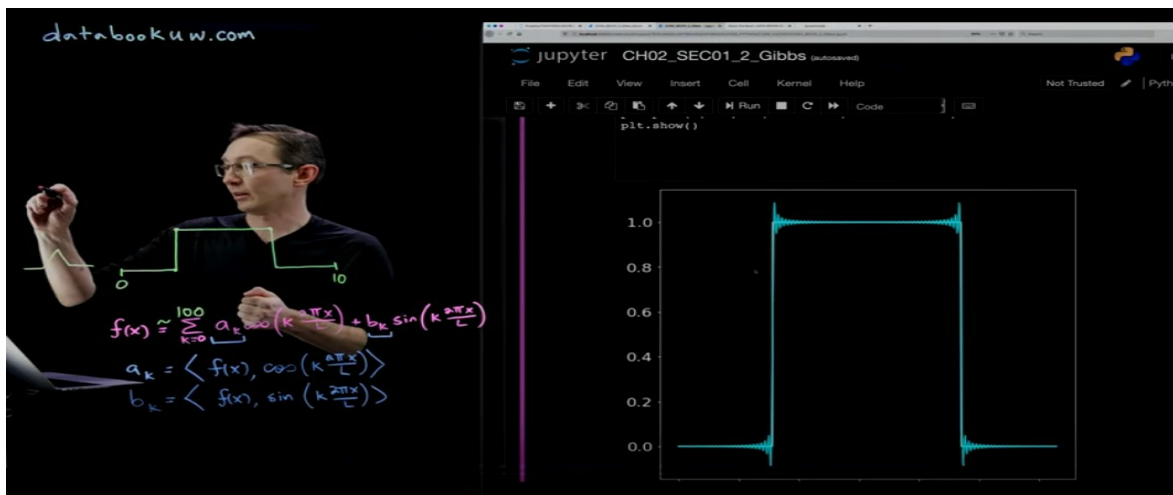
Fourier Series and Gibbs Phenomena [Python]

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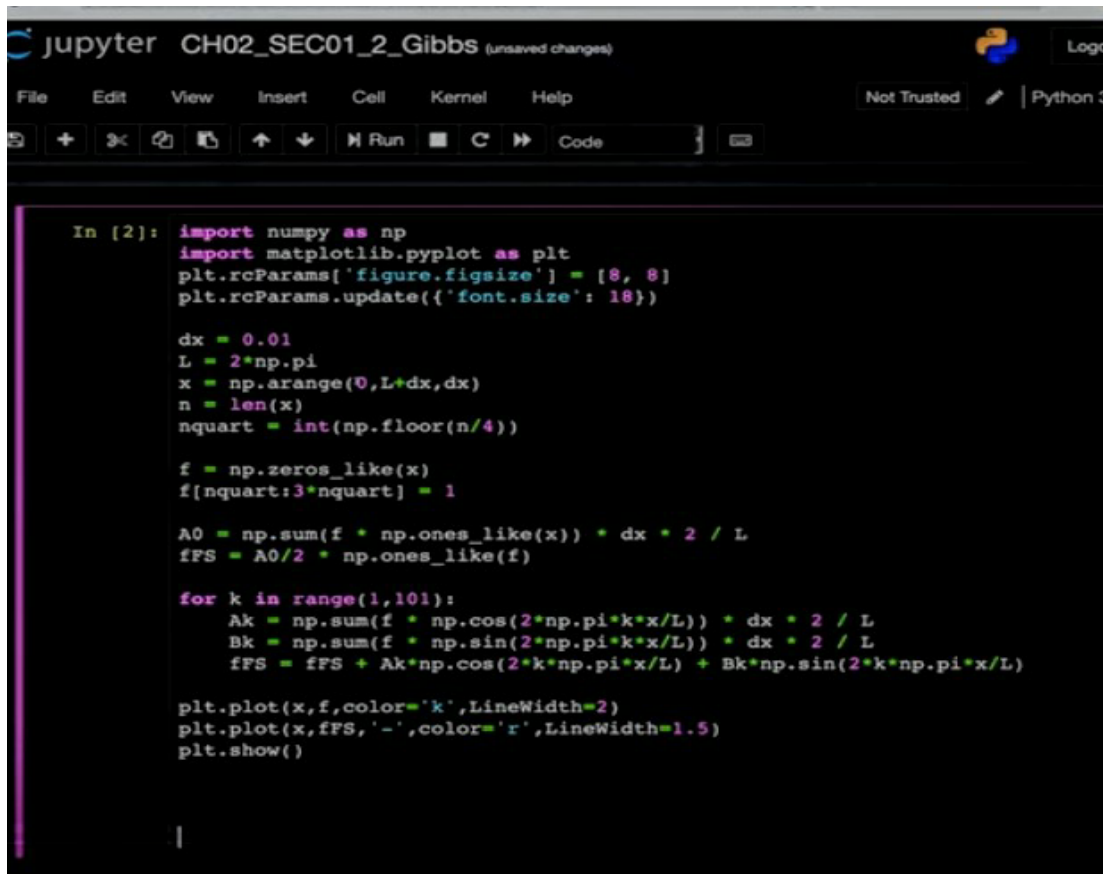
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Fourier Series & Gibbs Phenomena using Python :


```python
import numpy as np
import matplotlib.pyplot as plt
plt.rcParams['figure.figsize'] = [8, 8]
plt.rcParams.update({'font.size': 18})

dx = 0.01
L = 2*np.pi
x = np.arange(0,L+dx,dx)
n = len(x)
nquart = int(np.floor(n/4))

f = np.zeros_like(x)
f[nquart:3*nquart] = 1

A0 = np.sum(f * np.ones_like(x)) * dx * 2 / L
fFS = A0/2 * np.ones_like(f)

for k in range(1,101):
    Ak = np.sum(f * np.cos(2*np.pi*k*x/L)) * dx * 2 / L
    Bk = np.sum(f * np.sin(2*np.pi*k*x/L)) * dx * 2 / L
    fFS = fFS + Ak*np.cos(2*k*np.pi*x/L) + Bk*np.sin(2*k*np.pi*x/L)

plt.plot(x,f,color='k',LineWidth=2)
plt.plot(x,fFS,'-',color='r',LineWidth=1.5)
plt.show()
```

Fourier Transform Derivative :

- The fourier transform of the derivative of g(t) is given by,

$$\mathcal{F}\left\{\frac{dg(t)}{dt}\right\} = i2\pi f \cdot G(f)$$

Laplace Transform :

- Laplace, is an integral transform that converts a function of a real variable to a function of a complex variable.

- Laplace transform changes one signal into another according to some fixed set of rules or equations.

- The best way to convert differential equations into algebraic equations is the use of Laplace transform.

$$F(s) = \int\limits_{0}^{+\infty} f(t) \cdot e^{-s \cdot t} \cdot dt$$

Application of z-transorm :

- Used in analysis of digital filter.

- Used to simulate the continues system.

- Analyze the linear discrete system.

- Used in finding frequency response.

- Analysis of discrete signal.

- Helps in system design, analysis and also checks system stability.

- Used in automatic controls of telecommunication.

Date:	26-05-2020	Name:	K Muthu
Course:	Python Bootcamp 2020 build 15 working applications and Games	USN:	4al17ec038
Topic:	Matplotlib	Semester & Section:	6 & 'A'

AFTERNOON SESSION DETAILS
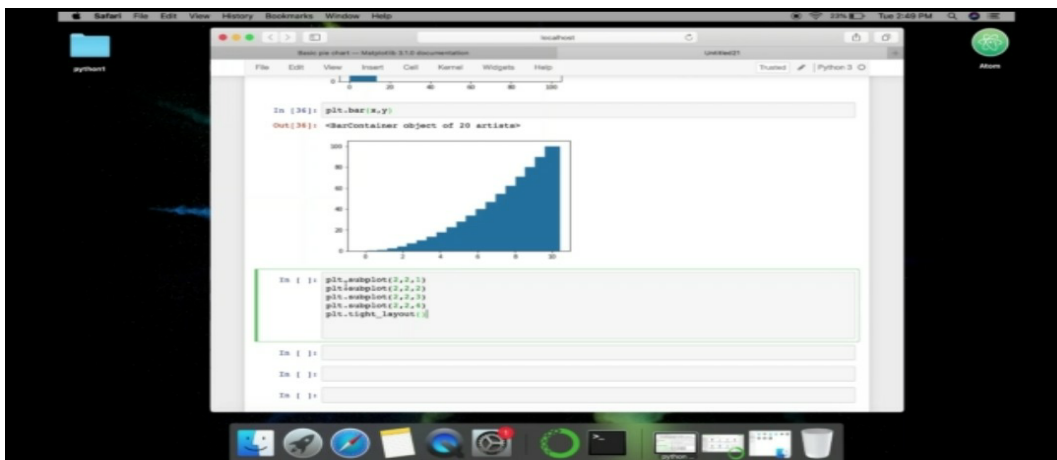
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Matplotlib :

- Matplotlib is an amazing visualization library in Python for 2D plots of arrays.

- Matplotlib is a multi-platform data visualization library built on NumPy arrays and designed to work with the broader SciPy stack.

- One of the greatest benefits of visualization is that it allows us visual access to huge amounts of data in easily digestible visuals.

- Common types of graphs in matplotlib are,

  - ✓ Histogram
  - ✓ Pie chart
  - ✓ Bar graph
  - ✓ Line graph
  - ✓ Fill graph
  - ✓ Scatter graph
  - ✓ Dot graph
  - ✓ Box plot

- Matplotlib is fast and efficient.

- It possesses the ability to work well with many operating systems and graphic backends.