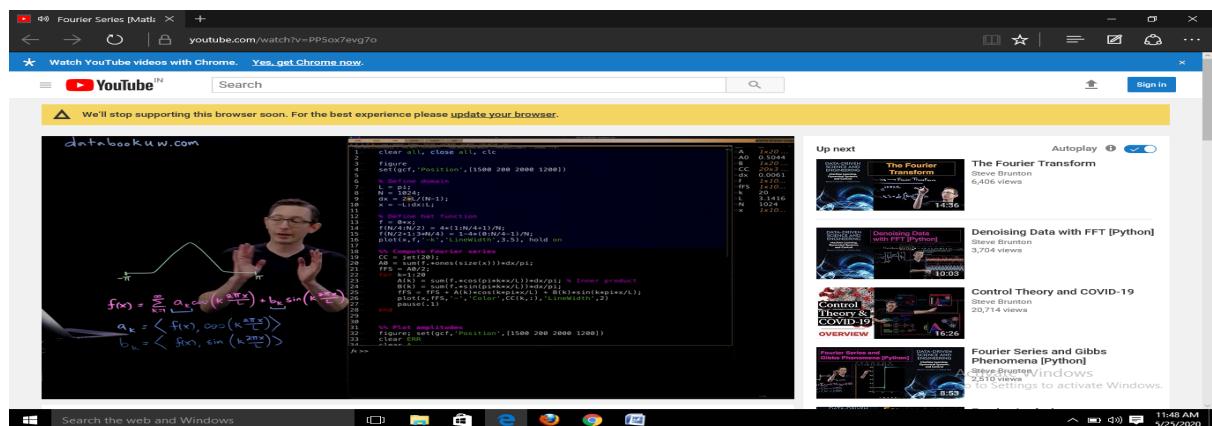
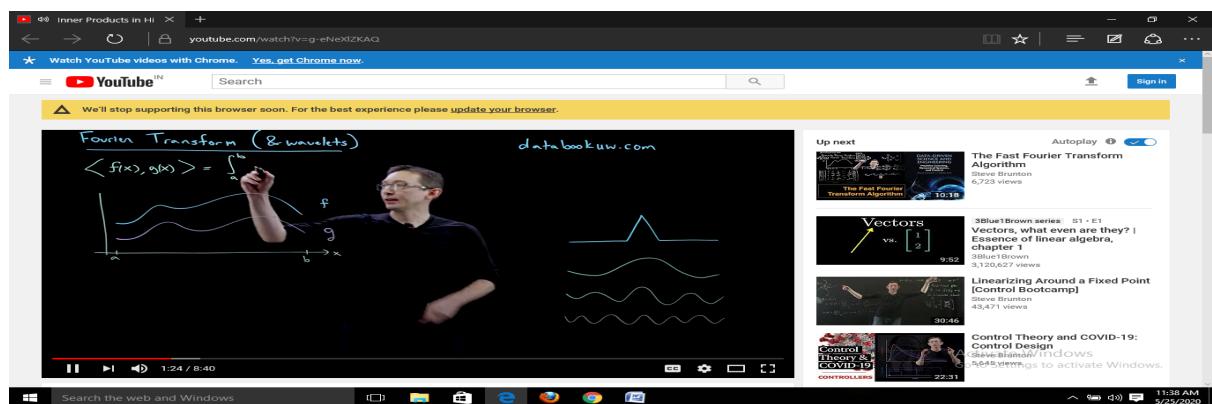
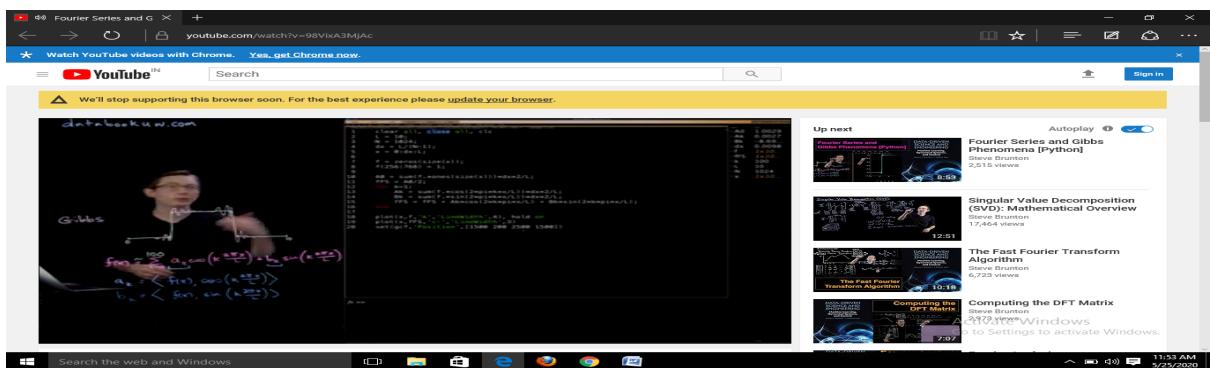
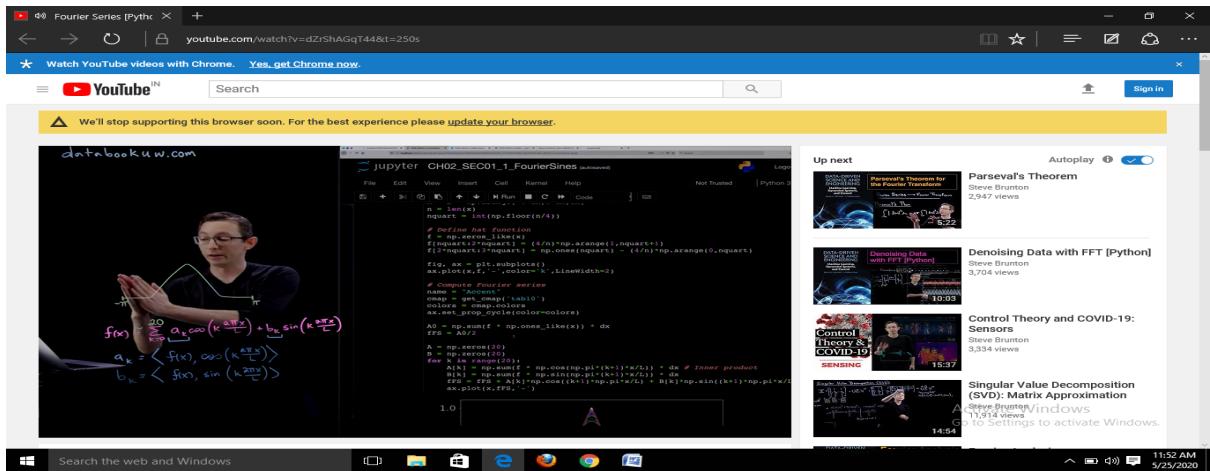


Date:	25-05-2020	Name:	Yamunashree N
Course:	Digital signal processing	USN:	4AL17EC097
Topic:	Introduction to fourier series & fourier transform, fourier series part-1, fourier series part-2, Inner Product in Hilbert Transform, complex fourier, fourier series using matlab, fourier series using python, fourier series & gibbs phenomena using matlab.	Semester and section	6 th sem and 'B' sec
Github repository:	yamunashree-courses		





25/05/2020

Digital signal programming

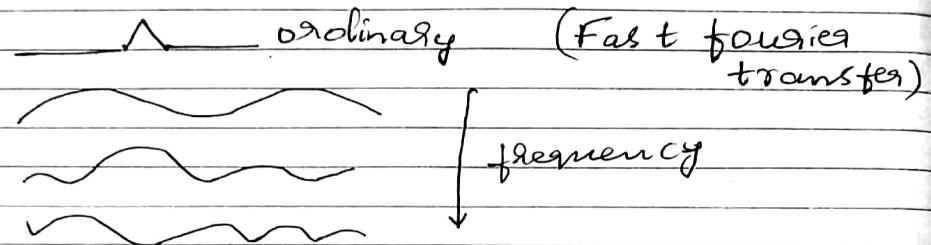
Day-1

- Fourier transfer (and wavelets)
- coordinate transform

$$[u(x,y)]$$

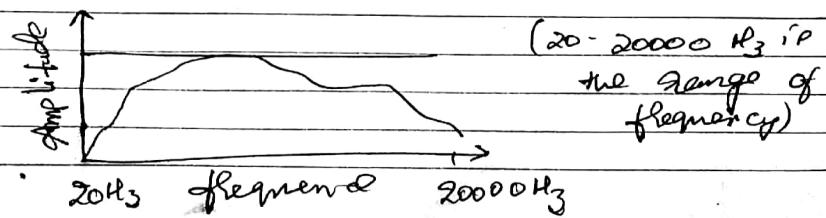
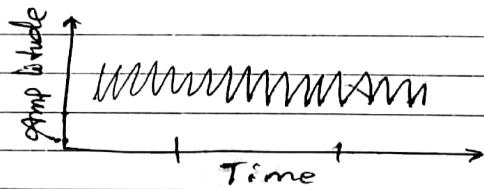
$$u_t = \alpha \cdot \nabla^2 u$$

SVD = data - driven FFT



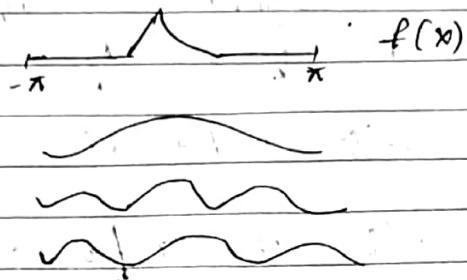
Fourier Series

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



Fourier Series: Part - 1

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



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

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

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

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

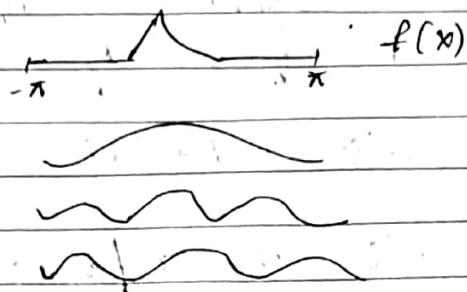
Fourier Series: Part - 2

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

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

Fourier Series Part - 1

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



$$f(x) = \frac{A_0}{2} + \sum_{k=1}^{\infty} (A_{k0} \cos(kx) + B_{k0} \sin(kx))$$

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

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

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

Fourier Series Part - 2

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

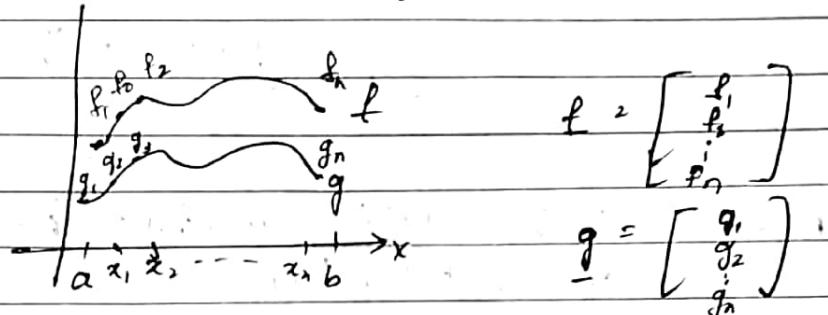
$$f(x) = \frac{A_0}{2} + \sum_{k=1}^{\infty} (A_k \cos\left(\frac{2\pi k x}{L}\right) + B_k \sin\left(\frac{2\pi k x}{L}\right))$$

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

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

Inner product in Hilbert Transform

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



$$\langle f, g \rangle = \underline{g^T} \underline{f} = \sum_{k=1}^n f_k \bar{g}_k$$

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

Complex Fourier Series

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

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

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

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

$$\begin{aligned}
 \langle \psi_j, \psi_k \rangle &= \int_{-\pi}^{\pi} e^{i j x} e^{-i k x} dx \\
 &= \int_{-\pi}^{\pi} e^{i(j-k)x} dx \\
 &= \frac{1}{i(j-k)} \left[e^{i(j-k)x} \right]_{-\pi}^{\pi} \\
 &= \begin{cases} 0 & \text{if } j \neq k \\ \frac{2\pi}{i(j-k)} & \text{if } j = k \end{cases} \\
 &= \frac{1}{2\pi} \sum_{k=0}^{\infty} \underbrace{\langle f(x), \psi_k \rangle}_{c_k} \frac{1}{e^{ikx}}
 \end{aligned}$$

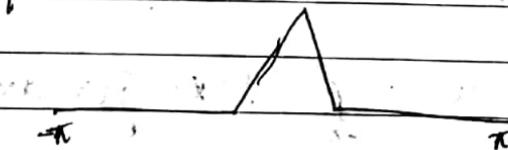
Fourier Series using matlab (use octave to execute the code)

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

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

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

output :



• Fourier Series using python

• Fourier Series and Gibbs phenomena using matlab

Date:	25-05-2020	Name:	Yamunashree N
Course:	Python programming	USN:	4AL17EC097
Topic:	Fixing programming errors & Application 3: Build a website blocker	Semester and section:	6 th sem and 'B' sect

```

142. Syntax Errors
errors.py
print(1)
int(9
int(999
print(2)
a = [1,2,3]
print 3
SyntaxError: Missing parentheses in call to 'print'
Ardis-MBP:NewVideos mia$ python3 errors.py
1
2
3
Ardis-MBP:NewVideos mia$ python3 errors.py
  File "errors.py", line 5
    a = [1,2,3]
           ^
SyntaxError: invalid syntax
Ardis-MBP:NewVideos mia$ 

```

The screenshot shows a terminal window titled '142. Syntax Errors'. It displays a Python script named 'errors.py' with several syntax errors. The errors include missing parentheses in a print statement and an invalid syntax error due to a missing colon after a list assignment. The terminal prompt shows the command 'python3 errors.py' being run.

145. Good Programming Questions

The Python Mega Course: Build 10 Real World Applications | Udemy

Question Details

ZeroDivisionError: division by zero

Hi, I run the following code and expected to get the division in the last print statement but I got an error. Here is my code:

```

1 a = 1
2 b = 0
3 c = a/b
4 print(c)

```

And here is the error:

```

2 Traceback (most recent call last):
  File "<stdin>", line 3, in <module>
  1
  2 ZeroDivisionError: division by zero

```

Can you help?

Add an answer

Activate Windows

Go to Settings to activate Windows.

This screenshot shows a question from an online forum. The user has posted a code snippet that performs a division by zero, expecting the result to be printed. However, they received a 'ZeroDivisionError: division by zero' exception. The code is as follows:

147. Website Blocker - How The Output Will Look Like

daily_blocker.py

```

1 import time
2 from datetime import datetime as dt
3
4 hosts_path=r"C:\Windows\System32\drivers\etc\hosts"
5 redirect="127.0.0.1"
6 website_list=["www.facebook.com", "www.dub119.mail.live.com"]
7 final_list=[redirect + " " + i for i in website_list]
8 final_string_block="\n".join(final_list)
9
10 while True:
11     if dt(dt.now().year, dt.now().month, dt.now().day, 8) < dt.now() < dt(dt.now().year, dt.now().month, dt.now().day, 18):
12         print("Within time...")
13         with open(hosts_path,"r+") as file:
14             content=file.read()
15             for website in website_list:
16                 if website in content:
17                     pass
18                 else:
19                     file.write(redirect+ " "+ website+"\n")
20             else:
21                 with open(hosts_path,"r+") as file:
22                     content=file.readlines()
23                     file.seek(0)
24                     for line in content:
25                         if not any(website in line for website in website_list):
26                             file.write(line)
27                         file.truncate()
28             time.sleep(2.5)
29

```

The screenshot shows a terminal window titled '147. Website Blocker - How The Output Will Look Like'. It displays a Python script named 'daily_blocker.py' which reads a list of websites from a file and writes them to the hosts file with a specific IP address. The script then reads the hosts file again to verify the changes. The terminal shows the execution of the script and its output.

video, here is another example:

```
1 | >>> lines = ["trees are good", "pool is fresh", "face is round"]
2 | >>> website_list = ["face", "clock", "trend"]
3 | >>> for line in lines:
4 | ...     any(website in line for website in website_list)
5 | ...
6 | False
7 | False
8 | True
```

We start iterating over the items of `website_list` using a `for` loop. In the first iteration we would have:

```
any(website in "trees are good" for website in
website_list)
```

Inside the parenthesis of `any()` there's another loop that iterates over `website_list`:

```
1 | ("face" in "trees are good")
2 | ("clock" in "trees are good")
3 | ("trend" in "trees are good")
```

If `any` of the above is `True` you get the expression evaluated to `True`. In this case none of them is `True`, so you get `False`.

If you want to return `True` (if all of them are `True`), use `all()` instead of `any()`.

So, the part `any(website in line for website in website_list)` will either be equal to `True` or `False`.

Activate Windows
Go to Settings to activate Windows.



25/05/2020

Day - 6

Fixing programming errors and
Application 3: Build a website
blocker

Fixing programming errors

* Syntax error

* Runtime errors

* E.

* How to fix difficult errors

* Good programming Questions

* Error Handling

Application 3: Build a website blocker

* Website blocker - how the output
will look like

* Application architecture

* Setting up for script

* Setting up the infinite loop

* Implementing the first loop

* Implementing the second part

