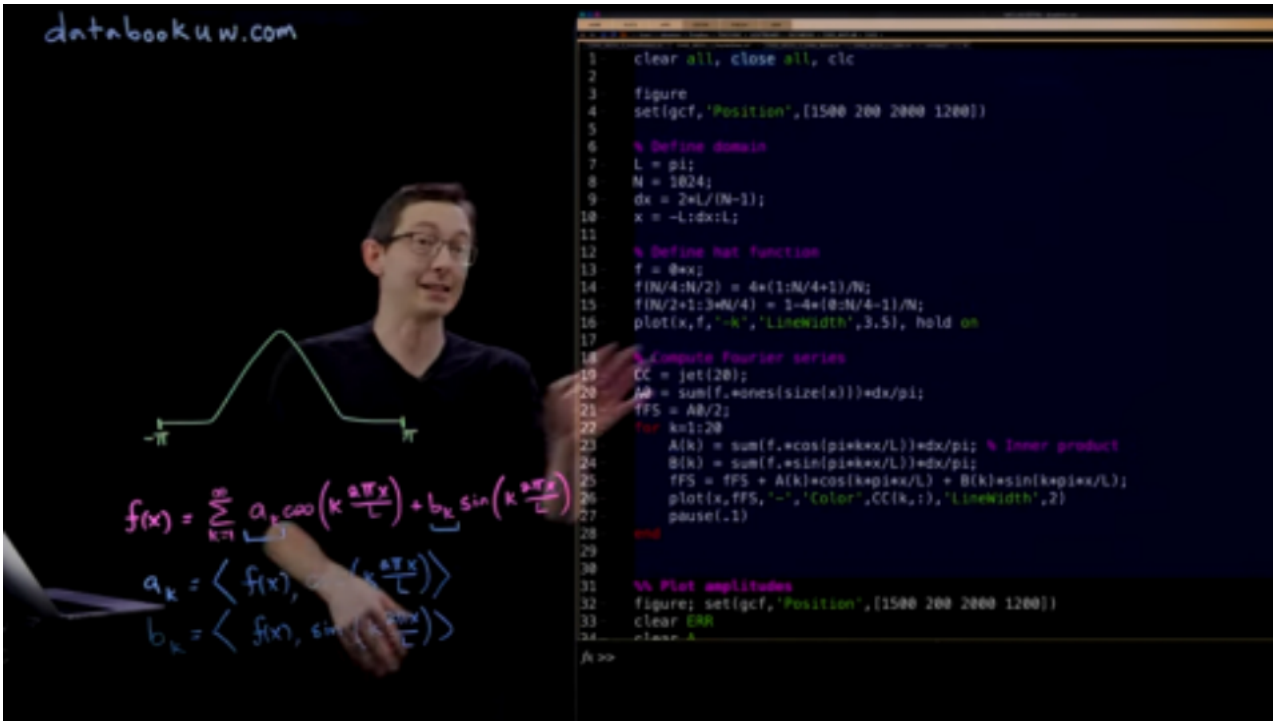
DAILY ASSESSMENT FORMAT

Date:	25-05-2020	Name:	Jagadeesha Hegde
Course:	Digital signal processing	USN:	4AL17EC036
Topic:	Introduction to Fourier Series & Fourier Transform, Fourier Series – Part 1, Fourier Series – Part 2, Inner Product in Hilbert Transform, Complex Fourier Series, Fourier Series using Matlab.(Use Octave to execute the code) Fourier Series using python(Experience implementation using Python), Fourier Series and Gibbs Phenomena Using Matlab	Semester & Section:	6th A-sec
Github Repository:	Jagadeesha-036		

FORENOON SESSION DETAILS
Image of session


Fourier Transform (& wavelets)
databookuw.com
Coordinate transform
u(x,y,t)
$u_t = \alpha \nabla^2 u$
SVD = Data-driven FFT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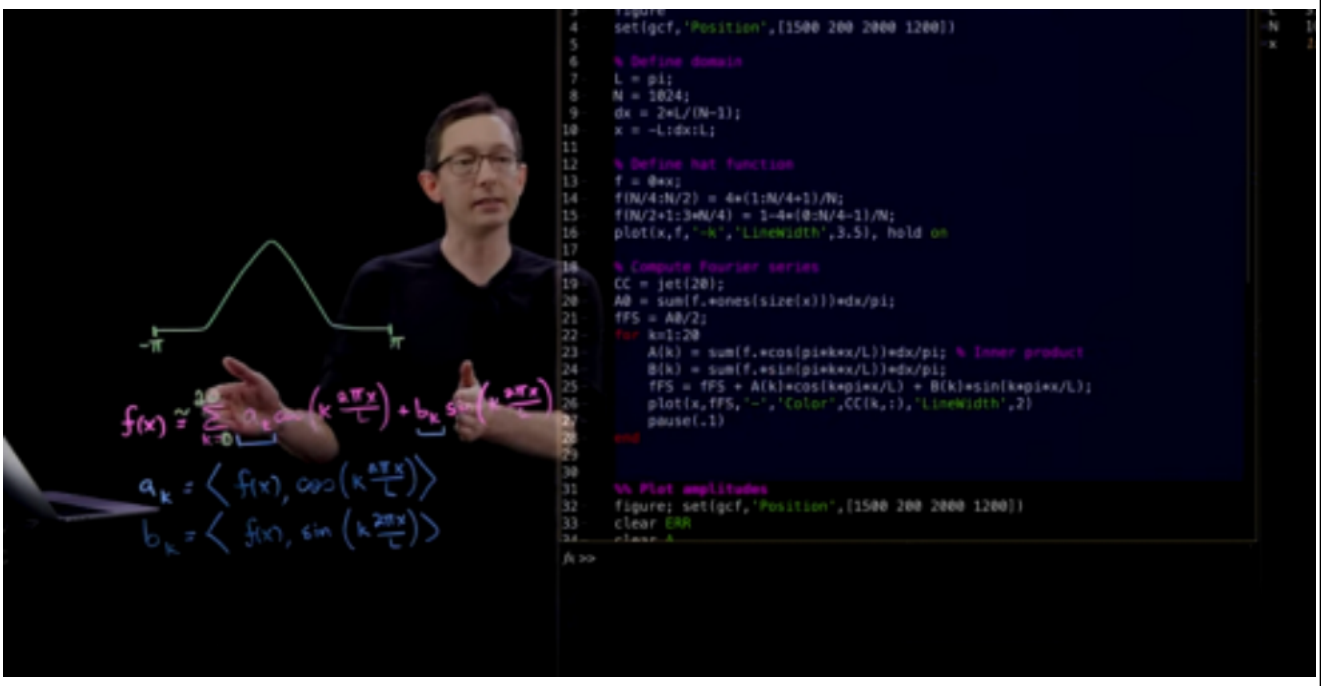
$f(x) = \sum_{k=1}^{\infty} a_k \cos\left(k\frac{\pi x}{L}\right) + b_k \sin\left(k\frac{\pi x}{L}\right)$
$a_k = \langle f(x), \cos\left(k\frac{\pi x}{L}\right) \rangle$
$b_k = \langle f(x), \sin\left(k\frac{\pi x}{L}\right) \rangle$
clear all, close all, clc
figure
set(gcf,'Position',[1500 200 2000 1200])
% Define domain
L = pi;
N = 1024;
dx = 2*L/(N-1);
x = -L:dx:L;
% Define hat function
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
% Compute Fourier series
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; % Inner product
B(k) = sum(f.*sin(pi*k*x/L))*dx/pi;
fFS = fFS + A(k)*cos(k*pi*x/L) + B(k)*sin(k*pi*x/L);
plot(x,fFS,'-','Color',CC(k,:),'LineWidth',2)
pause(.1)
end
%% Plot amplitudes
figure; set(gcf,'Position',[1500 200 2000 1200])
clear EAR

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

"kth" frequency bin

$$X_k = x_0 e^{-b_0 j} + x_1 e^{-b_1 j} + \ldots + x_n e^{-b_{N-1} j}$$

"nth" sample value



Report –

Discrete Fourier transform converts a finite sequence of equally-spaced samples of a function into a same-length sequence of equally-spaced samples of the discrete-time Fourier transform , which is a complex-valued function of frequency. The interval at which the DTFT is sampled is the reciprocal of the duration of the input sequence. An inverse DFT is a Fourier series, using the DTFT samples as coefficients of complex sinusoids at the corresponding DTFT frequencies. It has the same sample-values as the original input sequence. The DFT is therefore said to be a frequency domain representation of the original input sequence. If the original sequence spans all the non-zero values of a function, its DTFT is continuous, and the DFT provides discrete samples of one cycle. If the original sequence is one cycle of a periodic function, the DFT provides all the non-zero values of one DTFT

1.Fixing programming errors:

• Invalid syntax: For example, we need to put proper parenthesis, indentations.

"^ " indicates where the error is occurring.

• Handling exceptions: occurs between the try and except keywords has been executed.

• Runtime error: Every other error which is not an invalid syntax error is a Runtime error. for example: divide by zero, type error, identifier error, traceback error.

• After this section, we learnt on how to ask proper questions on errors.

• To solve the runtime errors, we can copy paste the error onto the google or if the logic behind the error is known, it can be solved easily by ourselves.

2.Application 3: Building a website blocker:

• Python website blocker is to block some certain websites which can distract the user during the specified amount of time.

• Every system has host file whether it is Mac, Windows or Linux.

Host file in Mac and Linux: /etc/hosts

Host file in Windows:C:\Windows\System32\drivers\etc

• Using python file handling manipulation, we will write the hostname in hosts.txt and remove the lines after our working hours.

• Windows user need to create a duplicate of OS's host file. Now provide the path of the duplicate file in hosts_path mentioned in the script.

• After the scheduling process on different operating systems, there are certain set of stepsto be followed on desktop to make the website blocker work.

• After the settings are completed the system has to get restarted. Finally, the website blocker works.