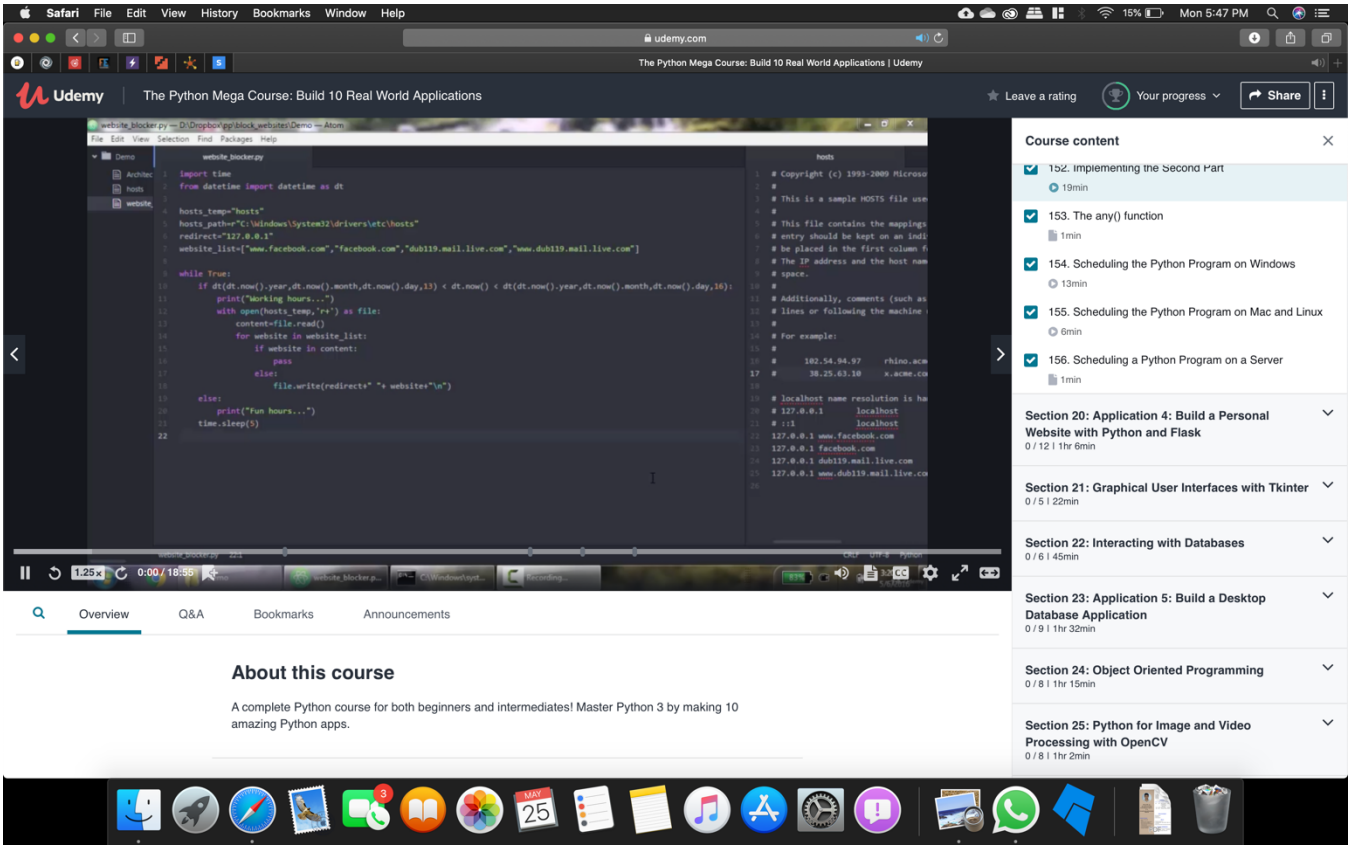
DAILY ASSESSMENT FORMAT

Date:	20/05/2020	Name:	Prajwal Kamagethi Chakravarti P L
Course:	Python	USN:	4AL17EC073
Topic:	Python	Semester & Section:	6 & B
Github Repository:	https://github.com/alvas-education-foundation/Prajwal-Kamagethi.git		

FORENOON SESSION DETAILS

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



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

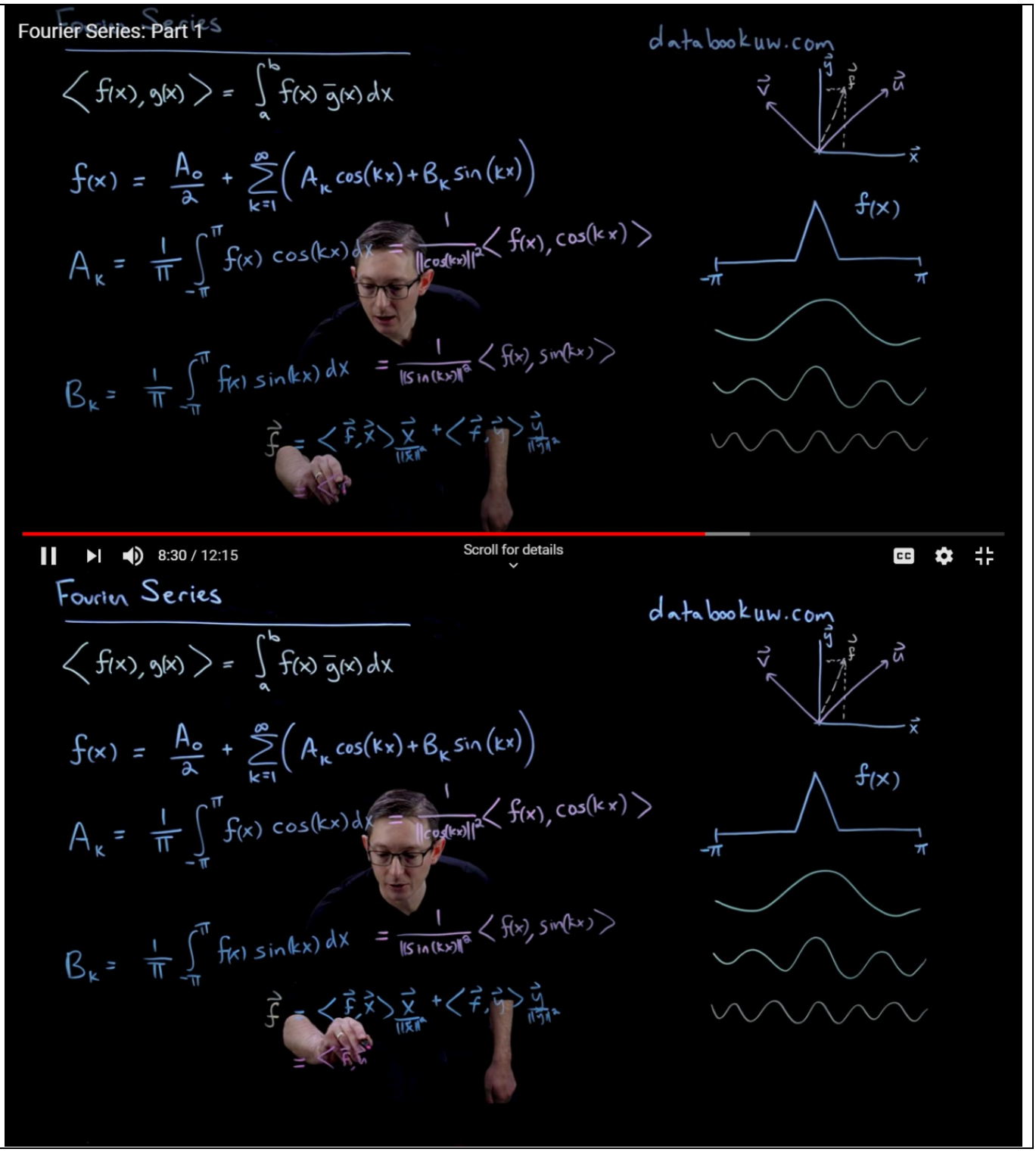
- **Using python file handling manipulation, we will write the hostname in hosts.txt and remove the lines after our working hours.**

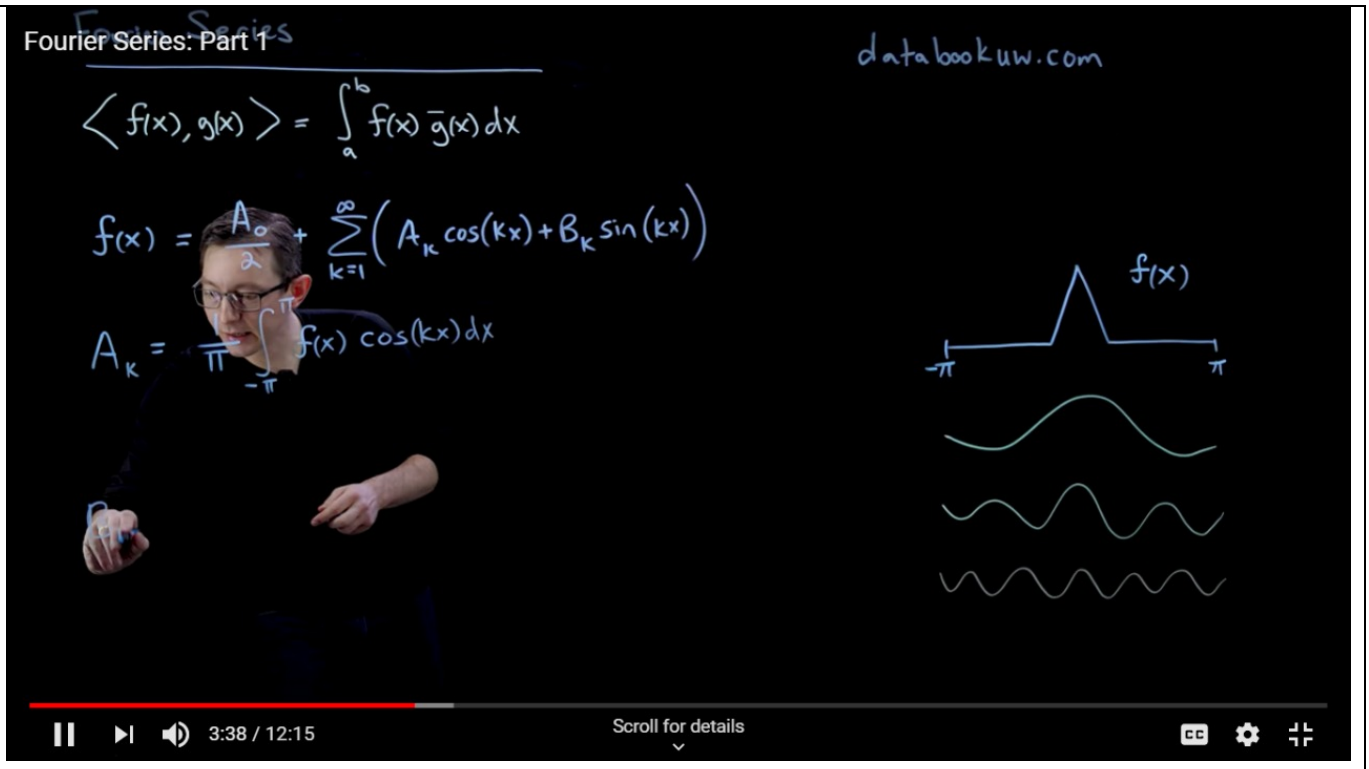
- **Windows user need to create a duplicate of OS's host file. Now provide the path of the duplicate file in hosts_path mentioned in the script.**

- **After the scheduling process on different operating systems, there are certain set of steps to 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.

Date:	**25-05-2020**	**Name:**	**Prajwal Kamagethi Chakravarti P L**
Course:	**Digital signal processing**	**USN:**	**4AL17EC073**
Topic:	**DSP**	**Semester & Section:**	**6TH & B**
Github Repository:	**https://github.com/alvas-education-foundation/Prajwal-Kamagethi.git**		


Fourier Series: Part 1
databookuw.com
$\langle f(x), g(x) \rangle = \int_a^b f(x)\,\bar{g}(x)\,dx$
$f(x) = \frac{A_0}{2} + \sum_{k=1}^{\infty}\left(A_k \cos(kx) + B_k \sin(kx)\right)$
$A_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\cos(kx)\,dx = \frac{1}{\|\cos(kx)\|^2}\langle f(x), \cos(kx)\rangle$
$B_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\sin(kx)\,dx = \frac{1}{\|\sin(kx)\|^2}\langle f(x), \sin(kx)\rangle$
$f(x)$
$-\pi$
π
8:30 / 12:15
Scroll for details
Fourier Series
databookuw.com
$\langle f(x), g(x) \rangle = \int_a^b f(x)\,\bar{g}(x)\,dx$
$f(x) = \frac{A_0}{2} + \sum_{k=1}^{\infty}\left(A_k \cos(kx) + B_k \sin(kx)\right)$
$A_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\cos(kx)\,dx = \frac{1}{\|\cos(kx)\|^2}\langle f(x), \cos(kx)\rangle$
$B_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\sin(kx)\,dx = \frac{1}{\|\sin(kx)\|^2}\langle f(x), \sin(kx)\rangle$
$f(x)$
$-\pi$
π


Fourier Series: Part 1
databookuw.com
$\langle f(x), g(x) \rangle = \int_a^b f(x)\,\bar{g}(x)\,dx$
$f(x) = \frac{A_0}{2} + \sum_{k=1}^{\infty}\left(A_k \cos(kx) + B_k \sin(kx)\right)$
$A_k = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\cos(kx)\,dx$
$f(x)$
$-\pi$
π
3:38 / 12:15
Scroll for details

Report:

Fourier Transform

* Coordinate transform –
  Applications in signal processing, mathematically.
  $u_t = \alpha \nabla^2 u$ – partial DE
  SVD – Data driven FFT.
  → Fast fourier Transform.
    - images, videos, etc are computed using FFT.
    - 1D algo, audio compression.

$$f(t) = \frac{1}{2} a_0 + \sum_{k=0}^{\infty} (a_k \cos 2\pi k t + b_k \sin 2\pi k t)$$

Fourier transform

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

$$x_a(f) = \int_{-\infty}^{\infty} x(t) \cos 2\pi ft \, dt.$$

$$x_b(f) = \int_{-\infty}^{\infty} x(t) \cdot \sin 2\pi ft \cdot dt$$

continuous $= X(f) = \int_{-\infty}^{\infty} x(t) \cdot e^{-2\pi ft} \cdot dt.$

discrete $= X_k = \sum_{n=0}^{N-1} x_n \cdot e^{-j\frac{2\pi kn}{N}}$

$$X_k = x_0 e^{-b_0 j} + x_1 e^{-b_1 j} + \cdots + x_n e^{-b_N \cdot j}$$

☆ Euler's formula

$$e^{jx} = \cos x + j \sin x$$

$$x_k = x_i \left[\cos(-b_0) + j \sin(-b_0)\right] + \cdots$$

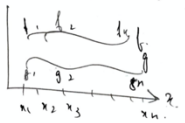
$$x_k = A_k + B_k j$$

$$mg = \sqrt{A_k^2 + B_k^2}$$

$$\theta = \tan^{-1}\left(\frac{B_k}{A_k}\right)$$

☆ Inner product in hilbert space.

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



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

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

$\langle f, g \rangle = g^T f = g\, f$

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

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

☆ Complex Fourier Series

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

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

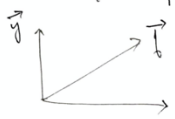
$e^{ikx} = \cos(kx) + \sin(kx)$

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

$\langle \psi_j, \psi_k \rangle = \int_{-\pi}^{\pi} e^{ijx} e^{-ikx}\, dx$

$= \int_{-\pi}^{\pi} e^{-(j-k)x} \cdot dx$

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



$= 1/2\pi \sum_{k=p} \frac{\langle f(x), \psi_k \rangle}{c_k \cdot \psi_k}$

☆ Fourier series & Gibbs

$f(x) = \sum_{k=0}^{100} a_k \cos\left(k \frac{2\pi x}{L}\right) + b_k \sin\left(k \frac{2\pi x}{L}\right)$

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

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