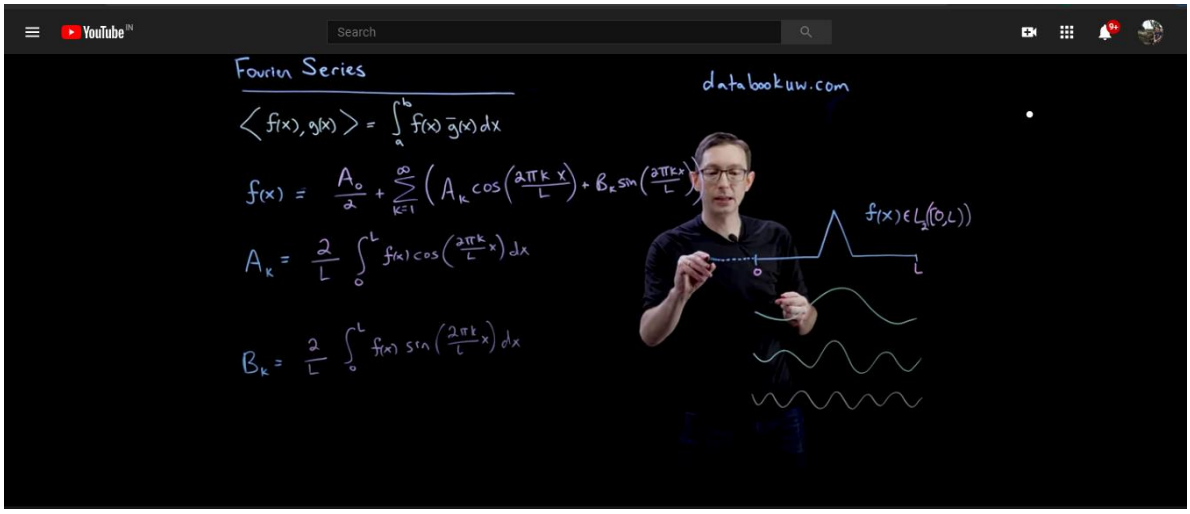
DAILY ASSESSMENT FORMAT

Date:	**25-May-2020**	**Name:**	**Swastik R Gowda**
Course:	**Digital Signal Processing**	**USN:**	**4AL17EC091**
Topic:	❖ **Fourier series and fourier transform** ❖ **Gibbs phenomenon** ❖ **Hilbert transform**	**Semester & Section:**	**6th Sem 'B' Sec**
Github Repository:	**Swastik-gowda**		

FORENOON SESSION DETAILS

Image of session



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

❖ Introduction to Fourier Series & Fourier Transform:

1.fourier series part1&part2
2.inner product in Hilbert transform
3.complex fourier series
4.fourier series using matlab,using octave execute the code
5.fourier series using python.
6.fourier series and gibbs phenomenon using matlab

- **Digital signal processing:** Digital signal processing is the use of digital processing, such as by computers or more specialized digital signal processors, to perform a wide variety of signal processing operations.

- **Fourier series:** The Fourier Series is a specialized tool that allows for any periodic signal (subject to certain conditions) to be decomposed into an infinite sum of everlasting sinusoids.
- **Fourier transform:** Digital Signal Processing/Discrete Fourier Transform. As the name implies, the Discrete Fourier Transform (DFT) is purely discrete: discrete-time data sets are converted into a discrete-frequency representation. This is in contrast to the DTFT that uses discrete time, but converts to continuous frequency.
- **Inner product in Hilbert transform:** The mathematical concept of a **Hilbert space**, named after David Hilbert, generalizes the notion of Euclidean space. It extends the methods of vector algebra and calculus from the two-dimensional Euclidean plane and three-dimensional space to spaces with any finite or infinite number of dimensions. A Hilbert space is an abstract vector space possessing the structure of an inner product that allows length and angle to be measured. Furthermore, Hilbert spaces are complete: there are enough limits in the space to allow the techniques of calculus to be used.
- **Fouries series using octave:**

```
x=3/pi;
f=0;
t=linspace(-3,2)
for i=1:1:10
an=x*1/i
f=f+an*sin(i*(pi/2).*t);
end
```

- **Fourier transform using python:**

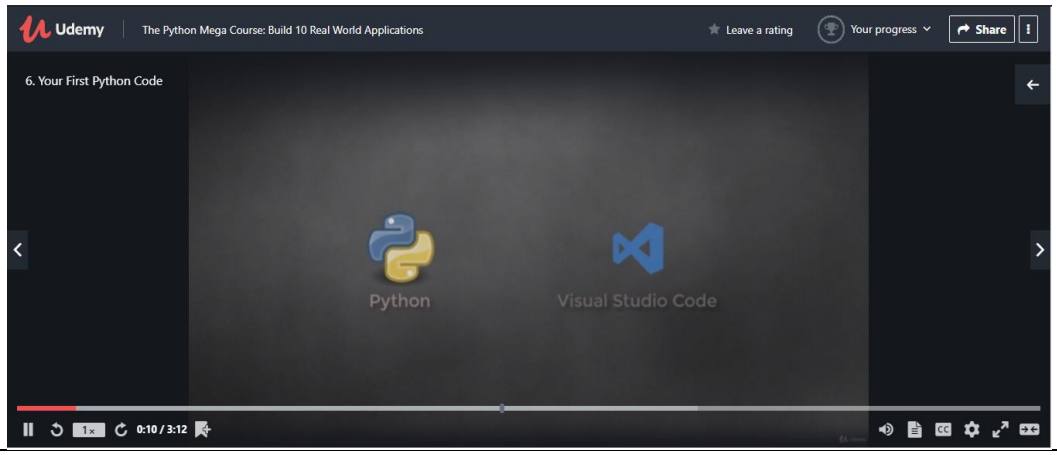
  from sympy import fourier_series, pi
  >>> from sympy.abc import x
  >>> s = fourier_series(x**2, (x, -pi, pi))
  >>> s.shift(1).truncate()
  -4*cos(x) + cos(2*x) + 1 + pi**2/3

- **Fourier series relation with Gibbs phenomenon:**
  The DC component of the signal is equal to the first Fourier series coefficient and is simply the average value of the signal over one period. ... This effect is known as Gibbs phenomenon and it manifests itself in the form of ripples of increasing frequency and closer to the transitions of the square signal.

Date:	**25-May-2020**	**Name:**	**Swastik R Gowda**
Course:	**Python**	**USN:**	**4AL17EC091**
Topic:	**Introduction to Python, Software Installation and Basics (Operational modes, loops and functional attributes)**	**Semester & Section:**	**6th Sem 'B' Sec**

AFTERNOON SESSION DETAILS

Image of session



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Python was first released in 1991, python 2 was released in 2000, and python 3 (the current version) in 2008. Python is mainly used for the automation purposes, web apps and data science. Many big companies like Amazon, Instagram use python in different parts of their products. For examples, Facebook uses python to process images.

Python 3 & the visual studio code IDE is used in the videos. The python interactive shell is a quick way to execute python code to see how it works. Python codes are written in .py files. We learnt a code that shows the current date and time using these codes.

```
Import datetime
X=datetime.datetime.now()
Print(x)
```

- In python '+' operator is used for concatenation for strings
  If y="10", then
  y+y=1010
- Types of the input can be printed by using 'type'
  Print(type(x),type(y),type(z))
  X=10
  Y="10" then x is integer, y is string

Compound data types are made up to different objects. The most important one is list.

- Integers are for representing whole numbers
- Floats represent continuous values
- Strings represent any text
- Lists represent arrays of values that may change during the course of the program

- Dictionaries represent pairs of keys and values
- Tuples represent arrays of values that are not being changed during the course of the program.

The lists, strings and tuples have a positive index system and also a negative index system

Days=[“Mon”, “Tue”, “We”, “Th”, “Fri”, “Sat”, “Sun”]
Days[:3]
This gives first three items of list

o/p :- [“Mon”, “Tue”, “We”]

Days[-3:]
This gives last three items of list

o/p :- [“Fri”, “Sat”, “Sun”]

A function can be defined using ‘def’

```
def cub_volume(a);
    return a*a*a
```

- A conditional block can have multiple conditions
- ‘and’ operator is used to check if both conditions are true at the same time.
- ‘or’ operator is used to check if at least one condition is true.
- To convert a string into upper case
  String.upper() is used.
- dir(_ _ _ builtins _ _ _)
  This gives all the builtins
- len(student_grades)
  This gives the length of the list.
- sum(student_grades)
  This gives the sum
- p.count(10)
- temp=[1,4,5]
  temp.append(6)
  o/p :-[1,4,5,6]
  Appends a number to the list. This is not applicable for dictionary.
- A python program can get user input via the input function
- The input function converts any input to a string, but you can convert it back to int or float.
  For loops are useful for executing a command over a large number of items.
- The name after for is just a variable name.
- We can loop over dictionary keys.
  While loop will run as long as condition is true.

```
While date : date: now() < date.date(2090,8,20)
    Print(“It’s not yet 19:30:20 of 2090.8.20”)
```

The loop above will print out the string inside print() over & over again until the 20th of August 2009.