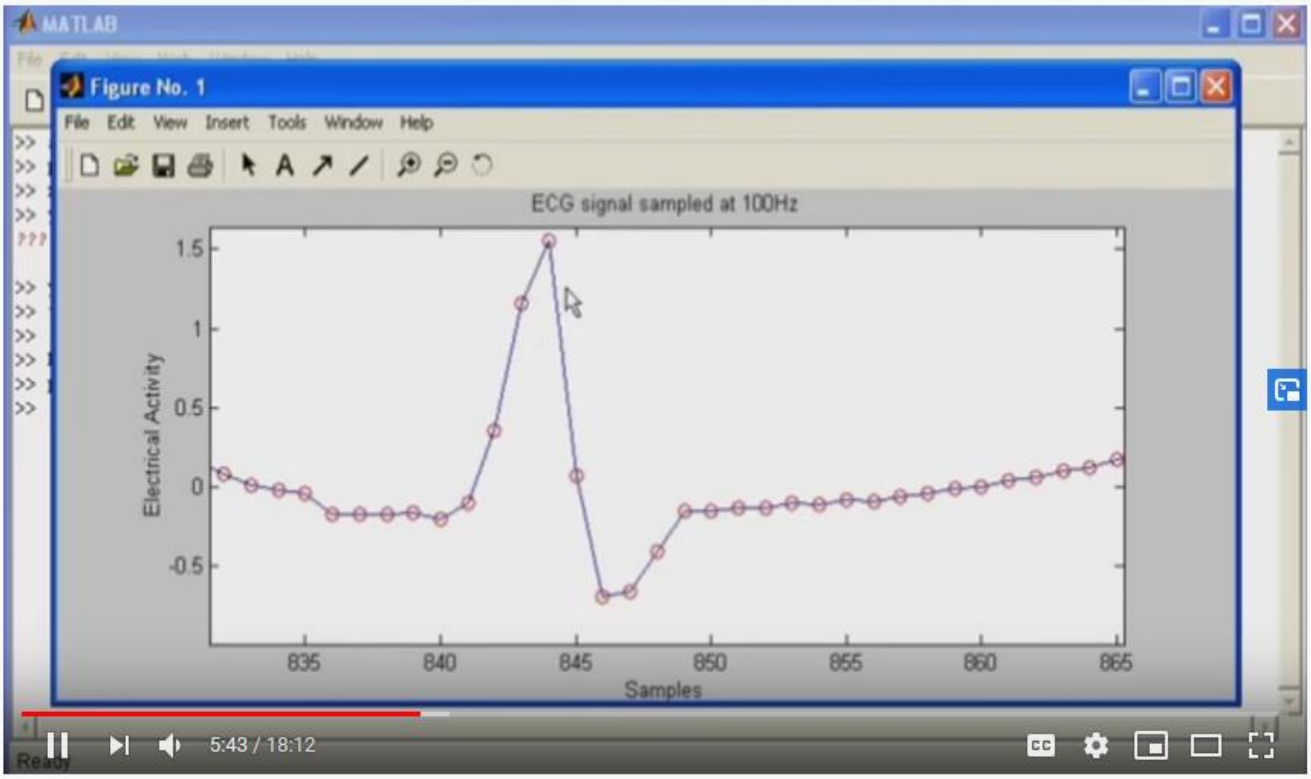
DAILY ASSESSMENT FORMAT

Date:	**27 may 2020**	**Name:**	**nishanth**
Course:	**Digitial signal processing**	**USN:**	**4al17ec063**
Topic:	1.Fourier Transforms **2.FFT** 3.FFT Fast Fourier Transform Matlab 4.FIR and IIR Filters 5.Study and analysis FIR and IIR using FDA tool in MatLab 6.Introduction to WT 7.CWT & DWT 8.Implementation of signal Filtering signal using WT in MatLAb 9.Short-time Fourier Transform and the Spectogram 10.Welch's method and windowing 11.ECG Signal Analysis Using MATLAB	**Semester & Section:**	**6th & b**
Github Repository:	**nishanthvr**		

FORENOON SESSION DETAILS
Image of session



ECG Signal Analysis Using MATLAB

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

day-3

Nishaith V.R

Fourier transform

the function F(s)

$$F(s) = \int_{-\infty}^{\infty} f(x)\, e^{isx}\, dx$$ → Fourier transform

$$b(x) = \frac{1}{2\pi} \int_{-\infty}^{\infty} F(s)\, e^{-isx}\, ds$$ — Inverse Fourier transform

is called inverse fourier transform of F(s)

Fast fourier transform

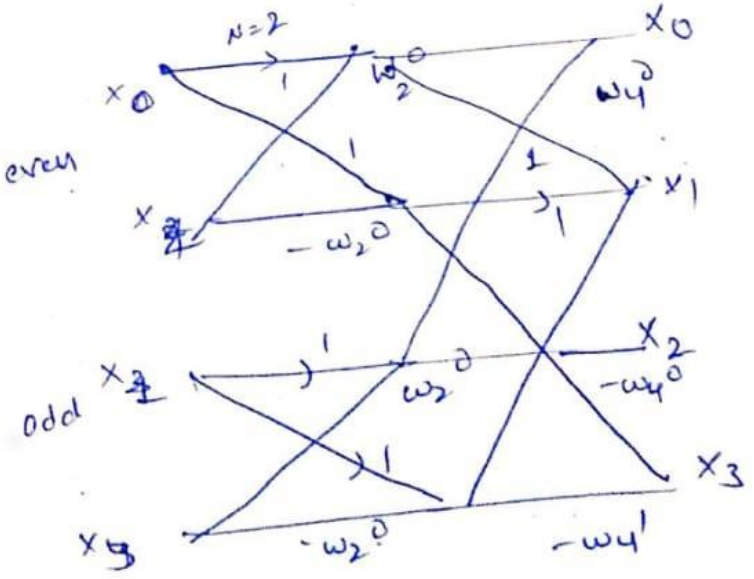
$$x_p = \sum_{n=0}^{N-1} x_n W_N^{np} \qquad W_N = e^{\frac{-j2\pi}{N}} \qquad 0 \le p \le N-1$$

$x_0 =$

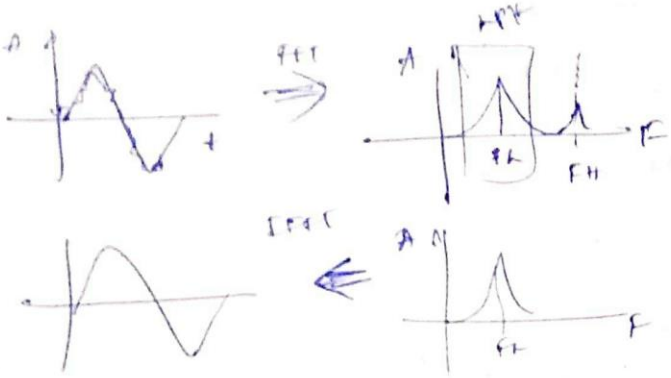
$x_1 =$

$x_2 =$

x_3



FFT fast fourier transform matlab



Program

```
FS = 1000;   % Sampling freqley
TS = 1/FS    % Sampling period or time step
dt = 0:TS:2-TS;   % Signal duration
f1 = 10;
f2 = 30;
f3 = 30;

y1 = 10*Sin(2*pi*f1*dt);
y2 = 10*Sin(2*pi*f2*dt);
y3 = 10*Sin(2*pi*f2*dt);   y4 = y1+y2+y3

Subplot(4,1,1)
plot(dt,y1,'r');
Subplot(4,1,2)
plot(dt,y2,'r');
Subplot(dt,y3,'r')
plot(dt,y3,'r');
Subplot(4,1,4)
plot(dt,y4,'r')

nfft = length(y4);   length of time domain signal
nfft2 = 2^nextpow2(nfft);
ff = fft(y4,nfft);
plot(abs(ff))
```

FIR and IIR filters

Digital filters are classified.

(1) IIR filters
(2) FIR filter

IIR — transfer function

$$H(z) = \frac{b_3 z^3 + b_2 z^2 + b_1 z + b_0}{z^3 + a_2 z^2 + a_1 z + a_0}$$

FIR filter

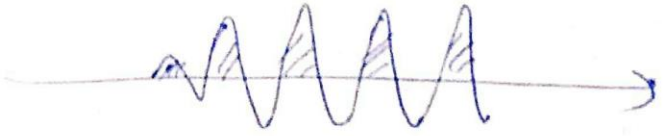
$$H(z) = \frac{b_3 z^3 + b_2 z^2 + b_1 z + b_0}{z^3}$$

Fourier transform

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

T time

wavelet transform



$$X(a,b) = \int_{-\infty}^{\infty} x(t)\, \psi^{*}_{a,b}(t)\, dt$$

Scale, translation

Correlation

$$C(a,b) = \int_{-\infty}^{\infty} x(t)\, \psi^{*}_{a,b}(t)\, dt$$

Implementation of signal filtering signal using WT in matlab

Power Spectrum Estimation Example Welch's method

Ex 1

Power spectrum using 'pwelch'

$$w[n] \rightarrow \boxed{H(e^{j\omega})} \rightarrow x(n)$$

$$S_{xx}(\omega) = |He(j\omega)|^2$$

$$S_{xx}(f) = |H(e^{j2\pi f/f_s})|^2$$

ECG Signal Analysis using matlab

```
Sig = load('ecg.txt');
plot(Sig)
```

Program to determine the BPM of the ECG Signal

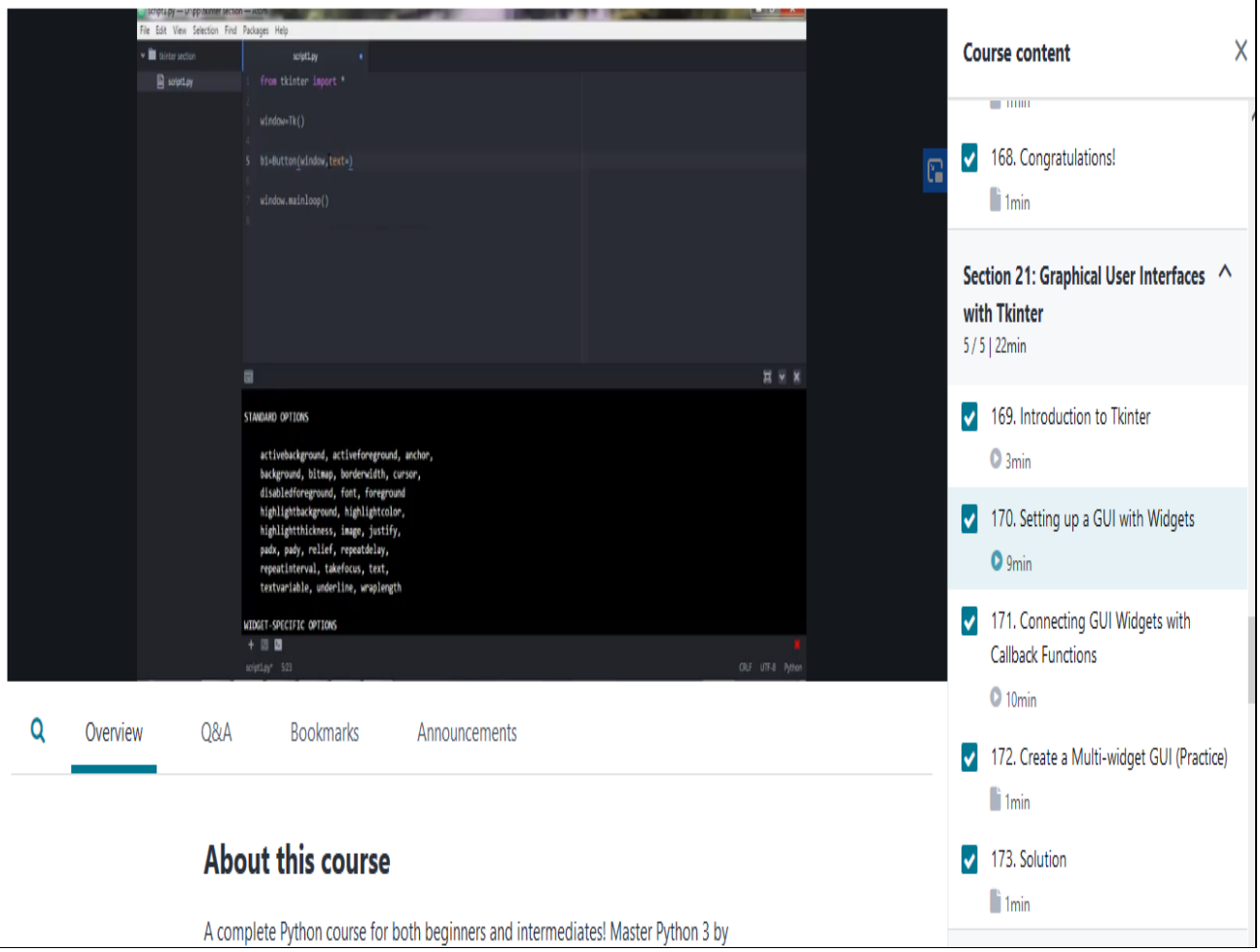
```
beat_count = 0;
for K=2:length(Sig)-1
end if (Sig(K) & sig(K-1) & Sig(K) > Sig(K+1) & Sig(K) > 1)
    disp('Prominat peak found');
  end
end
fs = 100;
N = length(Sig)
duration_in_seconds = N/fs;
duration_in_minutes = duration_in_seconds/60;
BPM = beat_count / duration_in_minutes
```

Output

Date:	**27 may 2020**	**Name:**	**nishanth**
Course:	**python**	**USN:**	**4al 17ec063**
Topic:	**Graphical User Interfaces with Tkinter**	**Semester & Section:**	**6th & b**

AFTERNOON SESSION DETAILS

Image of session



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

Create a Python program that expects a kilogram input value and converts that value to grams, pounds, and ounces when the user pushes the *Convert* button.

Program:

```
from tkinter import *

# Create an empty Tkinter window
window=Tk()

def from_kg():
    # Get user value from input box and multiply by 1000 to get kilograms
    gram=float(e2_value.get())*1000

      # Get user value from input box and multiply by 2.20462 to get pounds
      pound=float(e2_value.get())*2.20462

      # Get user value from input box and multiply by 35.274 to get ounces
      ounce=float(e2_value.get())*35.274

      # Empty the Text boxes if they had text from the previous use and fill them again
      t1.delete("1.0", END)  # Deletes the content of the Text box from start to END
      t1.insert(END,gram)  # Fill in the text box with the value of gram variable
      t2.delete("1.0", END)
      t2.insert(END,pound)
      t3.delete("1.0", END)
      t3.insert(END,ounce)

 # Create a Label widget with "Kg" as label
 e1=Label(window,text="Kg")
 e1.grid(row=0,column=0) # The Label is placed in position 0, 0 in the window

 e2_value=StringVar()  # Create a special StringVar object
 e2=Entry(window,textvariable=e2_value)  # Create an Entry box for users to enter the value
 e2.grid(row=0,column=1)

 # Create a button widget
 # The from_kg() function is called when the button is pushed
 b1=Button(window,text="Convert",command=from_kg)
 b1.grid(row=0,column=2)

 # Create three empty text boxes, t1, t2, and t3
 t1=Text(window,height=1,width=20)
 t1.grid(row=1,column=0)

 t2=Text(window,height=1,width=20)
 t2.grid(row=1,column=1)

 t3=Text(window,height=1,width=20)
 t3.grid(row=1,column=2)

 window.mainloop()
```