```
%clear previous workspace and command window"

clc
clear

% Load the reference mat file
load ReferenceSirenSignal.mat



prompt = 'Save the signal to be measured and compared in .wav format file in your desired locat
```

```
prompt =
'Save the signal to be measured and compared in .wav format file in your desired location in PC'
```

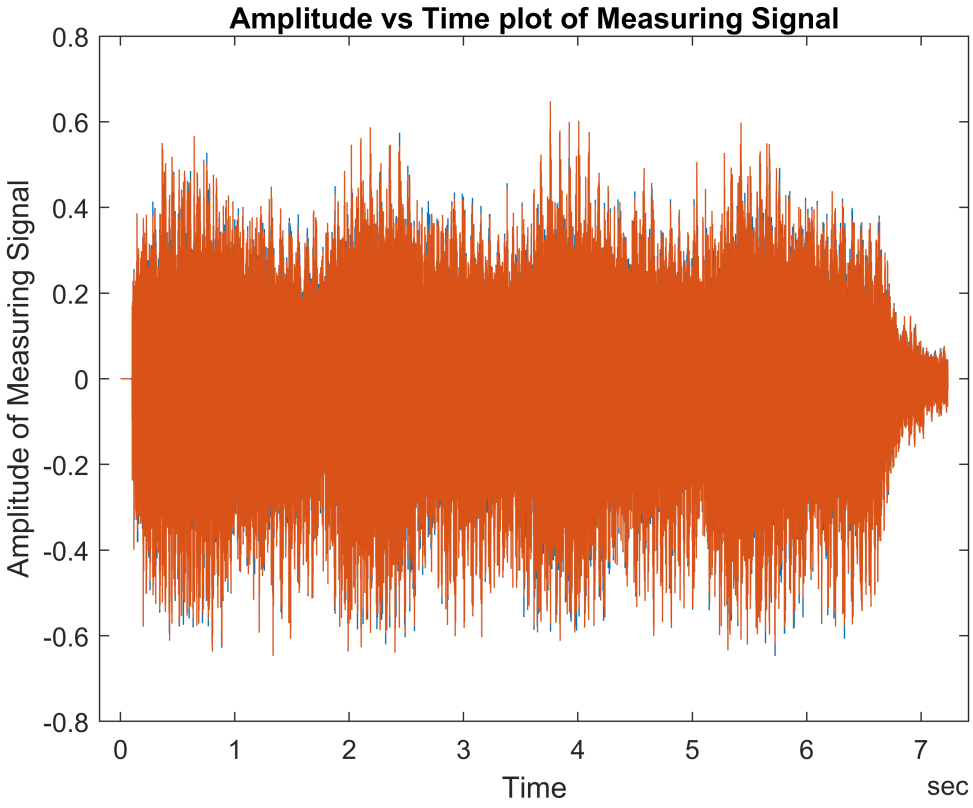
```
%{

Enter the location in the form of ""E:\MIT\MTech\DSP\Audio.wav"

%}

prompt = 'Please type the location of your wav file ';
Signal = input(prompt)
```

```
Signal =
"E:\MasterZSort\DSP\Siren.wav"
```

```


info = audioinfo(Signal)
```

```
info = struct with fields:
             Filename: 'E:\MasterZSort\DSP\Siren.wav'
    CompressionMethod: 'Uncompressed'
          NumChannels: 2
           SampleRate: 44100
         TotalSamples: 319104
             Duration: 7.2359
                Title: []
              Comment: []
               Artist: []
        BitsPerSample: 16
```

```
[y2,Fs2]= audioread(Signal);
t1 = 0:seconds(1/Fs2):seconds(info.Duration);
t1 = t1(1:end-1);
plot(t1,y2)
title('Amplitude vs Time plot of Measuring Signal')
xlabel('Time')
ylabel('Amplitude of Measuring Signal')
```



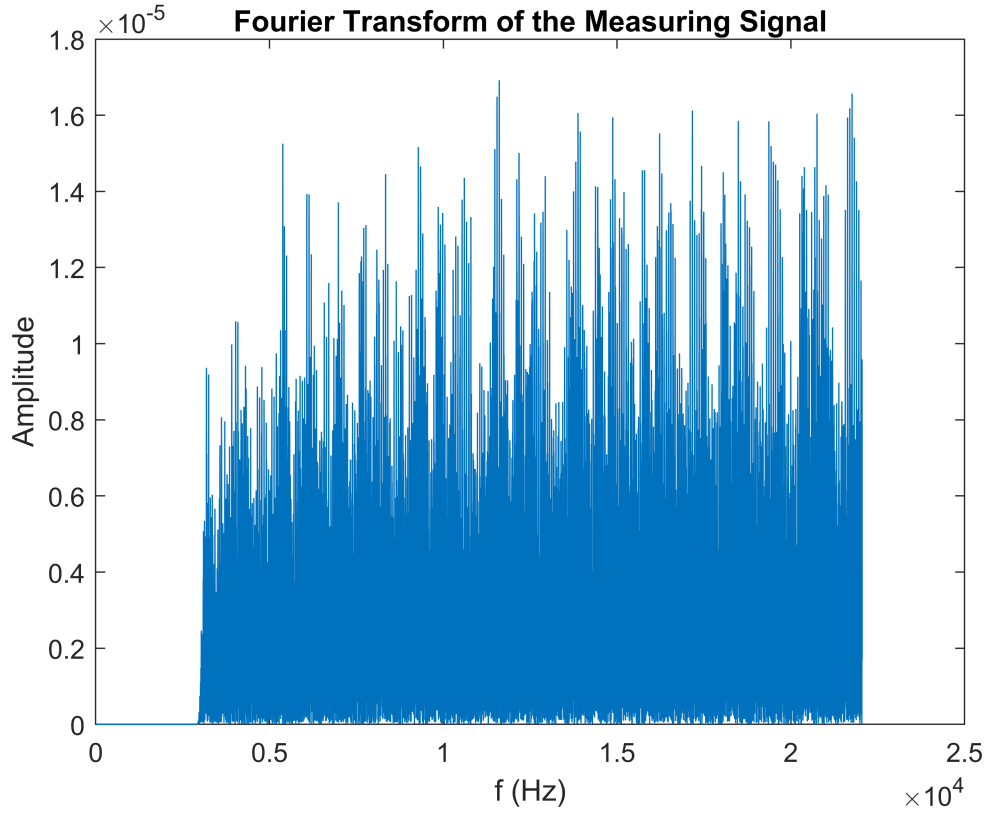

```
sound(y2,Fs2)


T=1/Fs2
```

```
T = 2.2676e-05
```

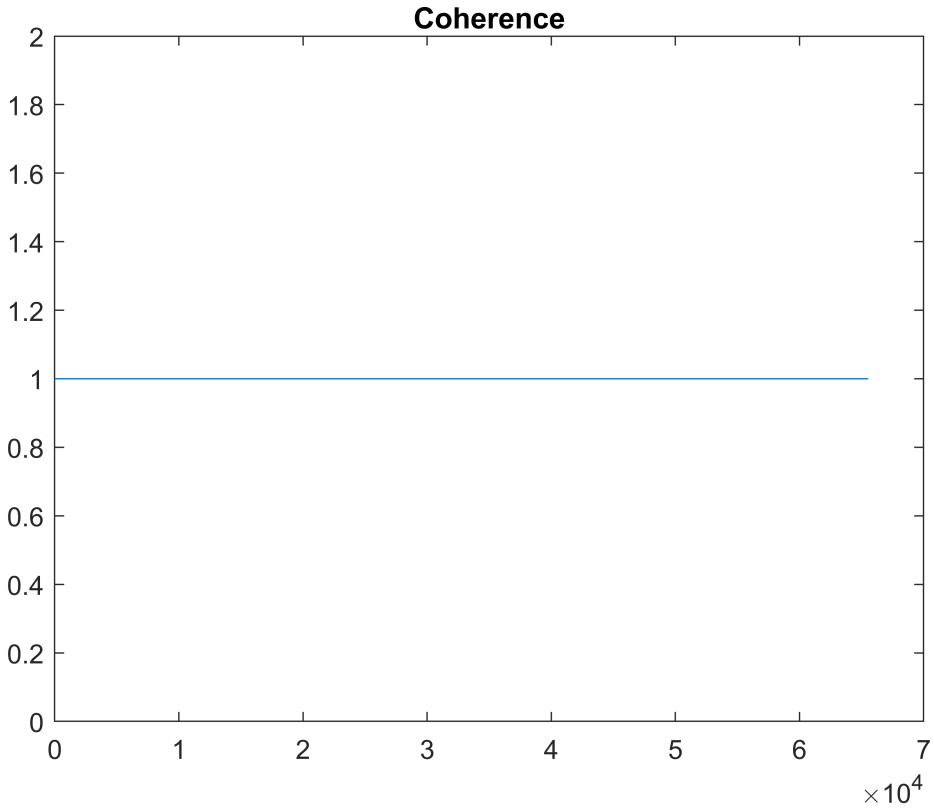
```
L = 72039;
t = (0:L-1)*T;
f2 = Fs2*(0:(L/2))/L;
P2 = abs(y2/L);
P1 = P2(1:L/2+1);
```

```
Warning: Integer operands are required for colon operator when used as index.
```

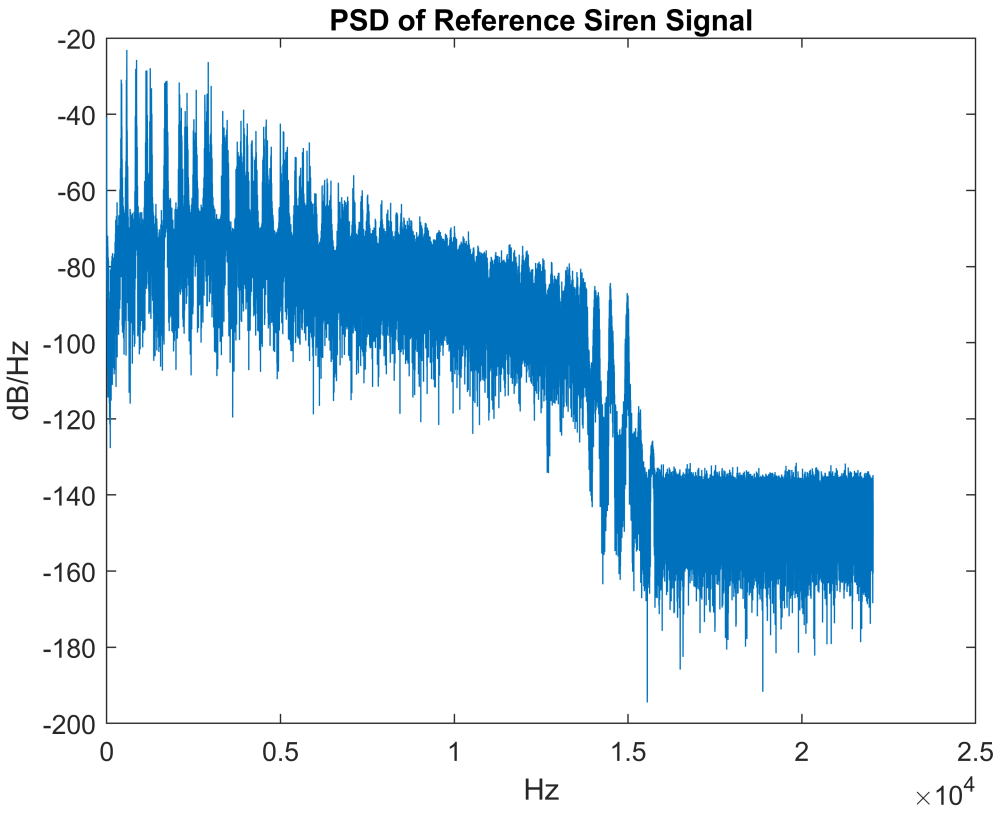
```
P1(2:end-1) = 2*P1(2:end-1);
plot(f2,P1)
title('Fourier Transform of the Measuring Signal')
xlabel('f (Hz)')
ylabel('Amplitude')
```



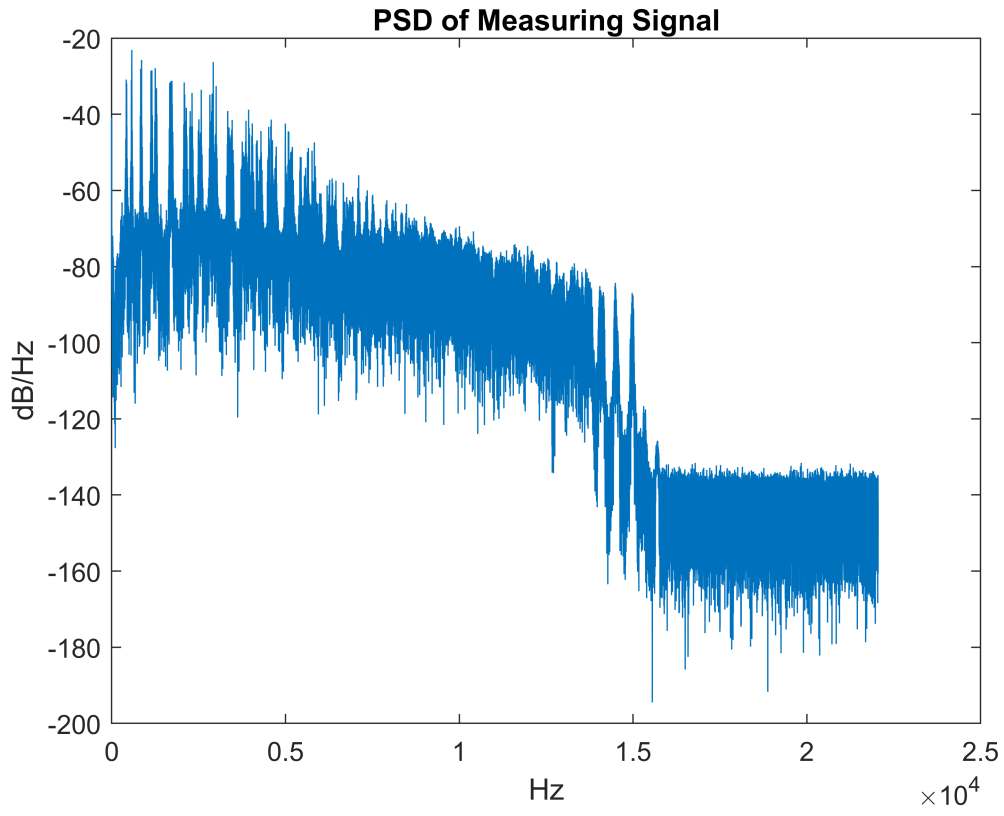

```
minLength = min(length(y1), length(y2));

y1 = y1(1:minLength);
y2 = y2(1:minLength);

cxy = mscohere(y1,y2);
confidence = max(cxy);


plot(cxy)
title('Coherence')
```




```
figure


psdestx = psd(spectrum.periodogram,y1,'Fs',Fs1,'NFFT',length(y1));
psdesty = psd(spectrum.periodogram,y2,'Fs',Fs2,'NFFT',length(y2));
plot(psdestx.Frequencies,10*log10(psdestx.Data));
title('PSD of Reference Siren Signal'); xlabel('Hz'); ylabel('dB/Hz');
```




```
figure;
plot(psdesty.Frequencies,10*log10(psdesty.Data));
title('PSD of Measuring Signal'); xlabel('Hz'); ylabel('dB/Hz');
```




```
if (confidence >= 0.95)
    disp('Siren Sound is detected as sufficient confidence level is obtained')

else
    disp('There is not enough confidence level to ascertain the detection the Siren Sound.')
end
```

```
Siren Sound is detected as sufficient confidence level is obtained
```