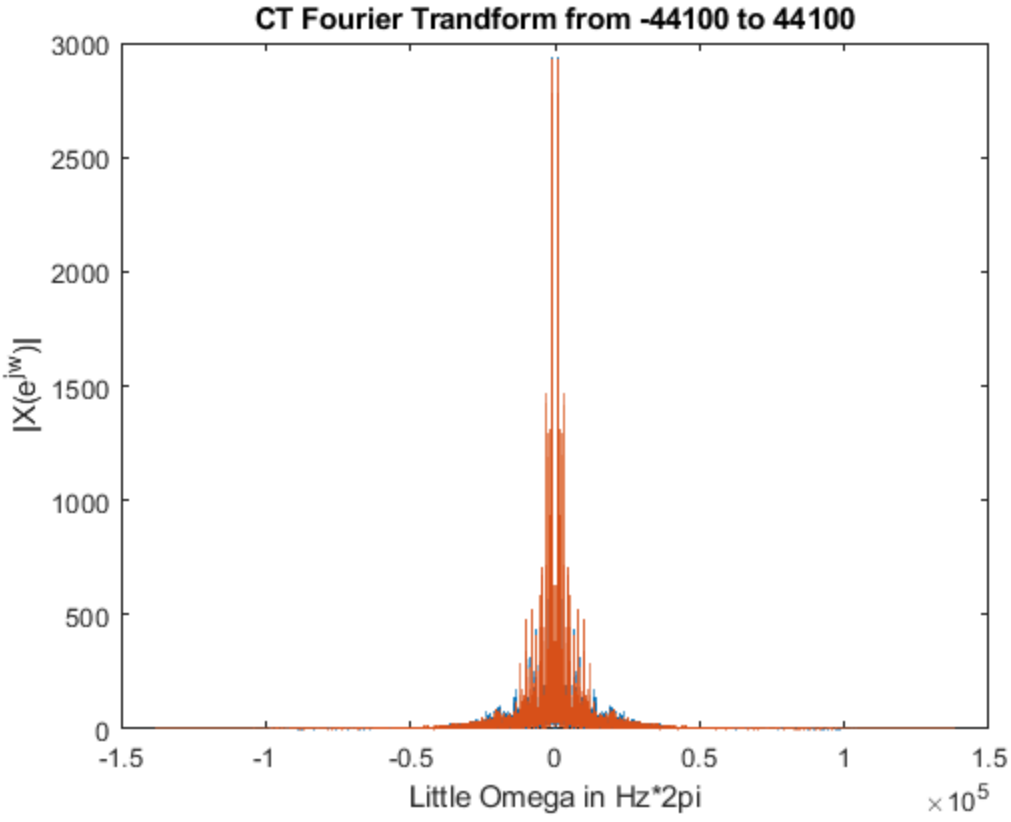
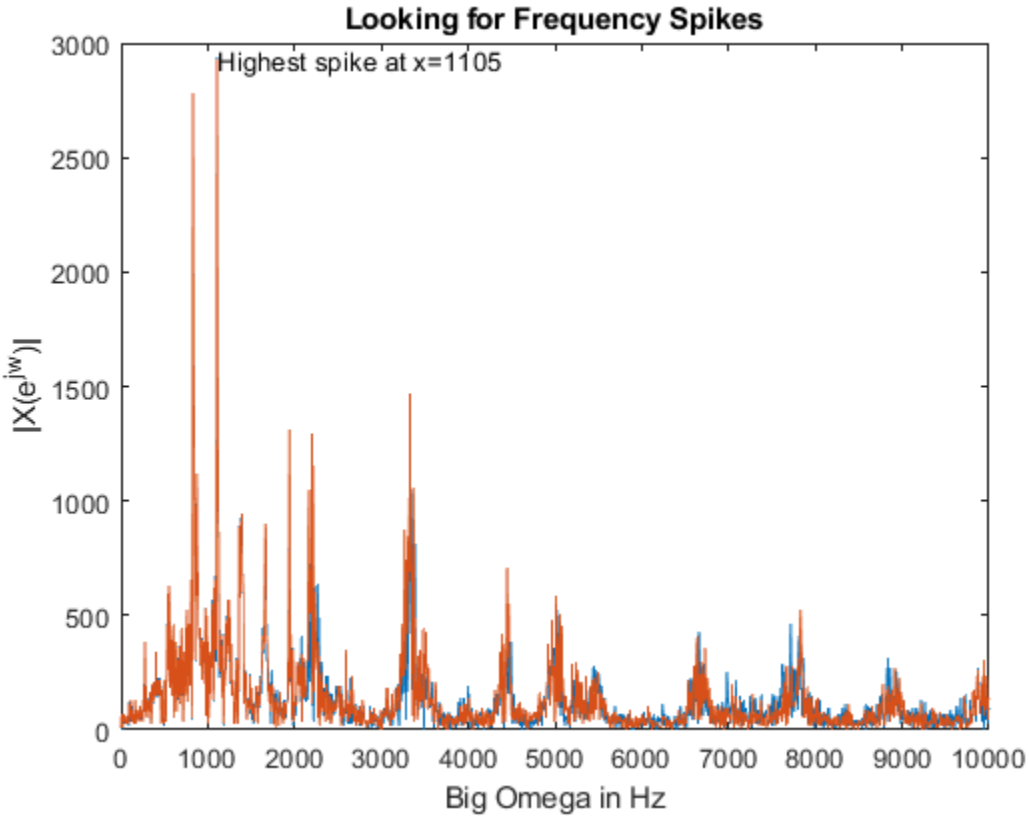
[ARTEM DUDKO] - [PS8] - [2021]

[PROBLEM #8.6]

```
clc; clear;
[x, FS] = audioread('sudno9sec.mp3');

Nfft = 2^ceil(log2(length(x)));
Y_CT = fftshift(fft(x,FS)); %X(e^jw), discrete time transform
little_omega = ((0:(FS-1)).*(2*pi/FS)-pi);

T = 1/FS;
big_omega = little_omega ./ T;
Y_DT = Y_CT ./ T;

%bpm = 160 > 2.666Hz

figure(1)
plot(big_omega,abs(Y_CT))
title('CT Fourier Trandform from -44100 to 44100')
xlabel('Little Omega in Hz*2pi')
ylabel('|X(e^j^w)|')

figure(2)
plot(big_omega,abs(Y_CT))
title('Looking for Frequency Spikes')
xlabel('Big Omega in Hz')
ylabel('|X(e^j^w)|')
xlim([0 10000])
text(1105,2929,'Highest spike at x=1105')

%At this point I am stuck, my largest spike is at x=1105, but I don't
 know
%how to get the BPM from that
%normalized by 2pi it becomes 175, which is close to 160 but it feels
 like
%a coincidence
```


CT Fourier Trandform from -44100 to 44100
3000
2500
2000
1500
1000
500
0
|X(e^jw)|
-1.5
-1
-0.5
0
0.5
1
1.5
Little Omega in Hz*2pi
×10^5


Looking for Frequency Spikes
Highest spike at x=1105
3000
2500
2000
1500
1000
500
0
|X(e^jw)|
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Big Omega in Hz

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