clear all clc;

x=1;

while x==1,

x=isempty (input ('Press enter to start program or press zero to quit. '));

ghighE=1318.1505;

gB=987.7669;

gG=783.9911;

gD=587.3297;

gA=440;

glowE=329.6277;

guitar=[ghighE,gB,gG,gD,gA,glowE];

if x==1,

p=input ('Which string are you adjusting? 1=e 2=B 3=G 4=D 5=A 6=E');

w=guitar (p);

y=isempty (input ('Press enter to record input signal or 0 to start over. '));

% record input signal

Fs=44100;

T=0:1:Fs/2-1;

RecordObject=audiorecorder(Fs,16,1);

record(RecordObject,2);

pause(3);

%record(RecordObject,'off');

I=getaudiodata(RecordObject,'double');

% to compare frequencies of a stored save file

% let's hear the input signal

display ('This is how the input signal sounds. ');

sound (I,Fs);

% fft of input signal

J=fft (I)/size(I,1);

K=0:1:Fs/2-1;

while y==1,

if p==6

for i=400:size(J,1)

J(i,1)=0;

end

else

for i=1500:size(J,1)

J(i,1)=0;

end

end

%Plotting

subplot(2,1,1);plot(I);

subplot(2,1,2);plot(K,2\*real(J(1:Fs/2)));

if p==6

axis([ 200 500 -0.01 0.01])

for i=400:size(J,1)

J(i,1)=0;

end

elseif p==5

axis([ 400 550 -0.01 0.01])

for i=550:size(J,1)

J(i,1)=0;

end

elseif p==4

axis([ 450 700 -0.01 0.01])

for i=700:size(J,1)

J(i,1)=0;

end

elseif p==3

axis([ 650 850 -0.01 0.01])

for i=900:size(J,1)

J(i,1)=0;

end

elseif p==2

axis([ 800 1100 -0.01 0.01])

for i=1200:size(J,1)

J(i,1)=0;

end

elseif p==1

axis([ 1200 1400 -0.01 0.01])

for i=1500:size(J,1)

J(i,1)=0;

end

end

% xlabel('Frequency(Hz)'),ylabel('Amplitude(V)');

% title('input signal');

K=0:1:(Fs/2-1);

(1.0015\*w);

K (J==max (J));

(0.9985\*w)

z=((K (find (J==max (J)))-w)/w)\*100;

if (1.0015\*w)>K (find (J==max (J)))&& (0.9985\*w) <K (find (J==max (J))),

display ('Perfect Intonation!!!');

disp (['The frequency of the input signal is, ',

num2str (K (find (J==max (J)))) 'Hz.']);

fprintf ('Percent Error % d %% \n',z)

elseif w>K (find (J==max (J))),

display ('Input frequency should be increased');

disp (['The frequency of the input signal is, ',num2str (K (find (J==max (J)))) 'Hz.']);

fprintf ('Percent Error % d %% \n',z)

elseif w<K (J==max (J)),

display ('Input frequency should be decreased');

disp (['The frequency of the input signal is, ',num2str (K (J==max (J))) 'Hz.']);

fprintf ('Percent Error % d %% \n',z)

end

y=isempty (input ('Make needed adjustments and press enter to record a new input signal or 0 to start over. '));

if y==1,

continue;

else x=1;

end

end

end

end