clc

clear all

close all

Fs=8000; %Sampling rate

vin=audiorecorder(Fs,16,1); %To record audio that is taken as input

disp('Press any key to start recording');pause

disp('Start speaking...');

recordblocking(vin,5); %To stop recoring after 5 seconds

disp('End of Recording...');

y=getaudiodata(vin); %To store data in array

t=(0:length(y)-1)/Fs;

rmin=Fs/500; %Maximum speech frequency at 500Hz=16

rmax=Fs/40; %Minimum speech frequency at 40Hz=200

c=xcorr(y,rmax); %Auto-correlation

r=(-rmax:rmax);

r1=c(rmax+1:2\*rmax+1); %Positive side of auto correlation waveform

[cmax i]=max(r1(rmin:rmax));

rxx=rmin+i-1;

F0=Fs/rxx; %Pitch calculation

disp('press any key to play the recording');pause

play(vin);

subplot(3,1,1);

plot(t,y, 'linewidth', 2);

set(gca, 'fontsize', 13, 'fontweight', 'bold');

title('Input audio waveform', 'fontsize', 15);

ylabel('Amplitude', 'fontsize', 12, 'fontweight', 'bold');

xlabel('Time(s)', 'fontsize', 12, 'fontweight', 'bold');

grid on;

subplot(3,1,2);

plot(r,c, 'linewidth', 2);

set(gca, 'fontsize', 13, 'fontweight', 'bold');

title('Auto-correlated waveform', 'fontsize', 15);

ylabel('Amplitude', 'fontsize', 12, 'fontweight', 'bold');

xlabel('Samples', 'fontsize', 12, 'fontweight', 'bold');

grid on;

subplot(3,1,3);

plot(r1,'linewidth', 2);

set(gca, 'fontsize', 13, 'fontweight', 'bold');

title('Positive half of auto-correlated waveform', 'fontsize', 15);

ylabel('Amplitude', 'fontsize', 12, 'fontweight', 'bold');

xlabel('Samples', 'fontsize', 12, 'fontweight', 'bold');

grid on;

if(F0>85 && F0<160)

fprintf('The Fundamental frequency is %f Hz',F0);fprintf('\n');

disp('It is a Male voice');

elseif(F0>160 && F0<255)

fprintf('The Fundamental frequency is %f Hz',F0);fprintf('\n');

disp('It is Female voice');

else

disp('Voice could not be recognised please try again');

end