clear all;

close all;

Fs=8000;

[y,Fs] = audioread( 'C:\Program Files\MATLAB\MATLAB Production Server\R2015a\bin\work\data\1-11.wav');

y=y./(1.01\*abs(max(y))); %normalizing the signal amplitude from-1.0 to 1.0

y=y(241:400); % select 20msec segment of the speech signal

N=160;

w=hamming(length(N));

y=y.\*w; %multiplying the signal with hamming window

P=10;

%autocorrelation

ycorr=xcorr(y,y);

ycorr=ycorr./(abs(max(ycorr)));

A=ycorr(1:P); %pth order autocorrelation sequence

r=ycorr(2:(P+1));

%r=abs(r);

figure;

subplot(3,1,1); plot(y);

title('voiced speech segment');

subplot(3,1,2); plot(ycorr);

title('Autocorrelation of voiced speech');

A=toeplitz(A); %toeplitz autocorrelation matrix

%A=abs(A);

L=-inv(A)\*r;%direct matrix solving method

%LP coefficients

disp('LP Coefficients are');

disp(L);

subplot(3,1,3);

plot(L);

title('Linear prediction coefficients');