

```
clc
clear all
close all
Fs=48000;
t = [0:1/Fs:2000/Fs];
Frq1=14000;
Frq2=14500;
delay = 48000;

%%%%%%%%%% CHIRP XCORR %%%%%%%%%%%
Fs=48000; % Sample frequency
t = [0:1/Fs:1]; % Timeinterval and length
Frq1=14000; % Start frequency for chirp
Frq2=14500; % End frequency for chirp
delay = 2000; % Signal Delay
Chirp_signal=chirp(t,Frq1,1,Frq2); % Chirp signal generation
Chirp_delayed=[zeros(1,delay),Chirp_signal]; % Chip delay generation
Chirp_xcorr=xcorr(Chirp_signal,Chirp_delayed); % Cross-correlation
LengthChirp_xcorr=length(Chirp_xcorr) % Calculate length of Xcorr
[XmaxChirp_xcorr,YmaxChirp_xcorr]=max(Chirp_xcorr) % Find maximum value
Delay_calcX1X2=((LengthChirp_xcorr+1)/2)-YmaxChirp_xcorr % Calculate Delay

figure;
plot(Chirp_xcorr)
title('Chirp')
xlabel('Samples')
ylabel('amplitude')

%%%%%%%%%% SINUS XCORR %%%%%%%%%%%
X3=sin(t*2*pi*8000);
X4=[zeros(1,delay),X3];

XcorrX3X4=xcorr(X4,X3);
figure;
plot(XcorrX3X4)
title('Sinusoid')
xlabel('Samples')
ylabel('amplitude')

LengthXcorrX3X4=length(XcorrX3X4)
[XmaxX3X4,YmaxX3X4]=max(XcorrX3X4)

Delay_calcX3X4=((LengthXcorrX3X4+1)/2)-YmaxX3X4

%%%%%%%%%% NOISE XCORR %%%%%%%%%%%

X5 =wgn(1,Fs/10,1);
soundsc(X5,Fs)
X6 = [zeros(1,delay),X5];
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XcorrX5X6=xcorr(X5,X6);  
figure;  
plot(XcorrX5X6)  
title('Noise')  
xlabel('Samples')  
ylabel('amplitude')  
  
LengthXcorrX5X6=length(XcorrX5X6)  
[XmaxX5X6,YmaxX5X6]=max(XcorrX5X6)  
  
Delay_calcX5X6=((LengthXcorrX5X6+1)/2)-YmaxX5X6
```