Matlab Codes

n=512; %number of points

Fs=900; %sampling fequency

fo=100;f1=3\*fo; %frequencies in Hz

t=(0:(n-1))/Fs; %time vector

y=sin(2\*pi\*fo\*t)+ 0.8\*cos(2\*pi\*f1\*t)+0.1\*randn(1,n); %time domain signal with noise

p=fft(y); %frequency domain transformation

F=(0:(n/2)-1)\*Fs/512;

figure(1); clf

subplot(211); plot(F,abs(p(1:256)),'b.-'); xlabel('Frequency (Hz)'); ylabel('Magnitude'); %ploting graphs

subplot(212); plot(F,angle(p(1:256)),'m.-'); xlabel('Frequency (Hz)'); ylabel('Phase'); %ploting graphs

In signal’s mathematical function, there are “fo” and “f1”, and “f1” given as

f1=3\*fo

so ,

f1=300

As a result of nyquist rate we have to choose the sampling signal

Fs >= 2\*f1

Fs>= 2\*300

Fs>= 600

Because of this, i choose

Fs=900.

