

## Contents

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- [3b, copied 3a code](#)

```
A = 3.7;
f0 = 0.3308;
N = 512;
NFFT = 32768;

n = linspace(0,N-1,N);
x_w = A * cos(2*pi()*f0*n);

fft_x_w = fft(x_w,NFFT);
ffw_x_w_dB = 20 * log10(abs(fft_x_w) + 0.0000000000001);

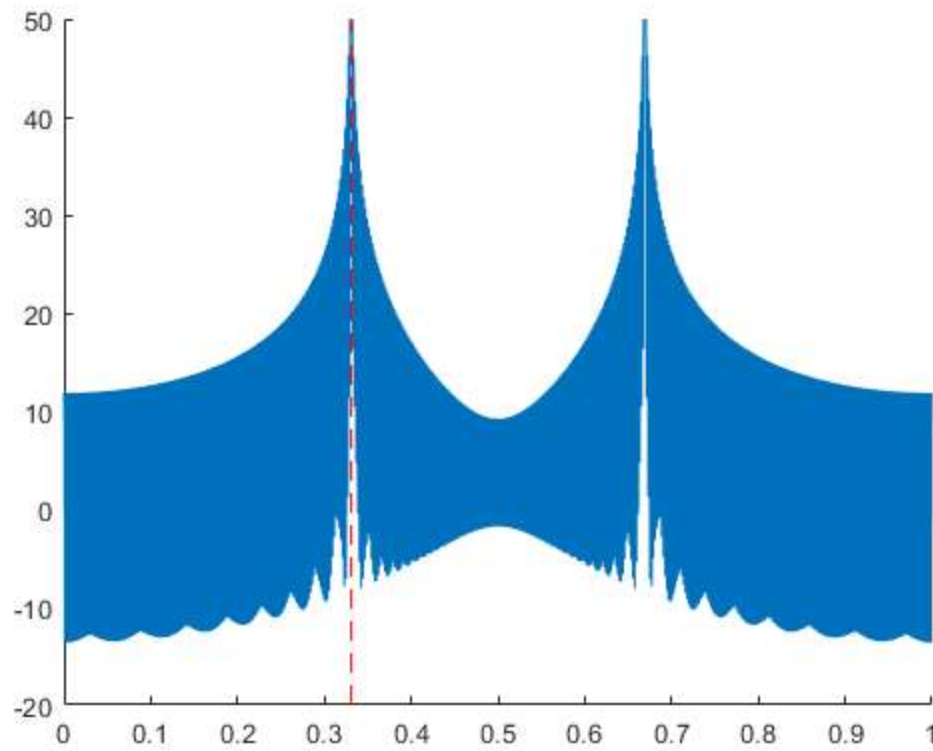
f = linspace(0,1,NFFT);

figure;
hold on;

plot(f,ffw_x_w_dB);
ylim([-20 50]);

plot([f0 f0], ylim, '--r'); %shows f0

hold off;
```



**3b, copied 3a code**

```
fprintf('NEW INSTANCE \n');

A = 3.7;
f0 = 0.3308;
N = 512;
NFFT = 32768;
n = linspace(0,N-1,N);
x_w = A * cos(2*pi()*f0*n);
fft_x_w = fft(x_w,NFFT);
ffw_x_w_dB = 20 * log10(abs(fft_x_w) + 0.00000000000001);
f = linspace(0,1,NFFT);
figure;
hold on;
plot(f,ffw_x_w_dB);
ylim([-20 60]);
xlim([0.30 0.35]);
plot([f0 f0], ylim,'--r'); %shows f0

%end of 3a code

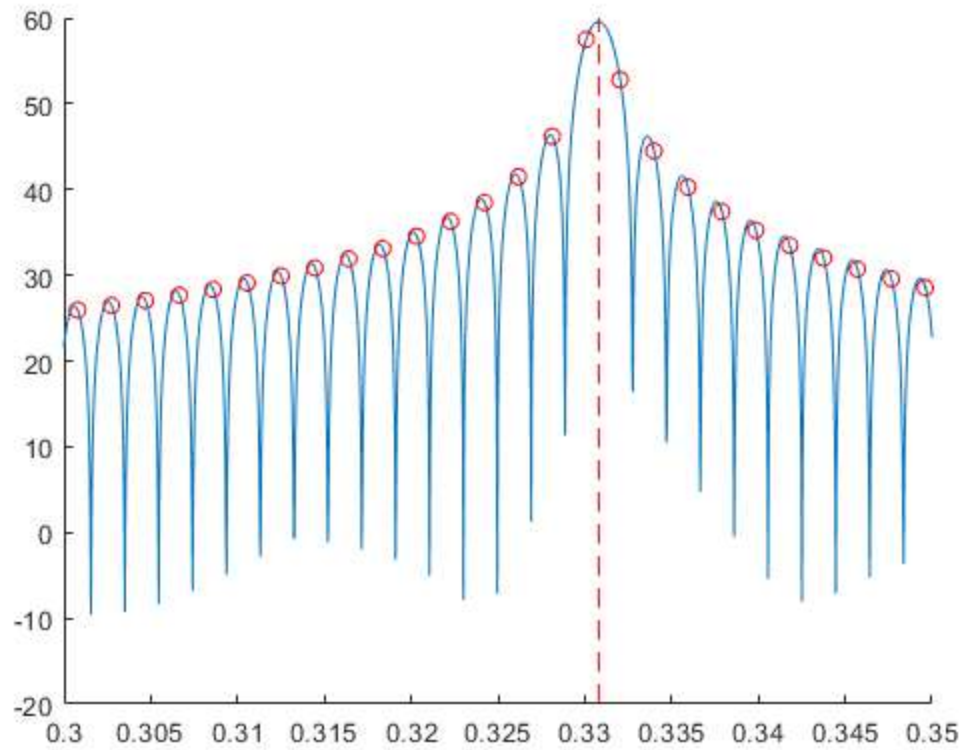
ffw_x_w_DFT = fft(x_w); %512-point DFT calculation
fft_x_w_DFT_dB = 20 * log10(abs(ffw_x_w_DFT) + 0.00000000000000000001);

f_DFT = linspace(0,1,N+1);%aligns 512 DFT points to 30k point DFT curve

plot(f_DFT(1:N),fft_x_w_DFT_dB,'ro','MarkerSize',6,'DisplayName','512-point DFT');
```

```
ylim([-20 60]);  
xlim([0.30 0.35]);
```

NEW INSTANCE



```
hold off;
```

```
plot(n,fft_x_w_DFT_dB,'ro','MarkerSize',6,'DisplayName','512-point DFT');
```

