

# PROJECT 1 - PROB. 2

Note Title

3/31/2011

```
>> % How to generate a Sinusoid
>> F0=4000;      % Freq in Hz
>> Fs=10000;    % Sampling freq in Hz
>> w0=2*pi*F0/Fs; % digital freq in radians
>> w0
```

```
w0 =
```

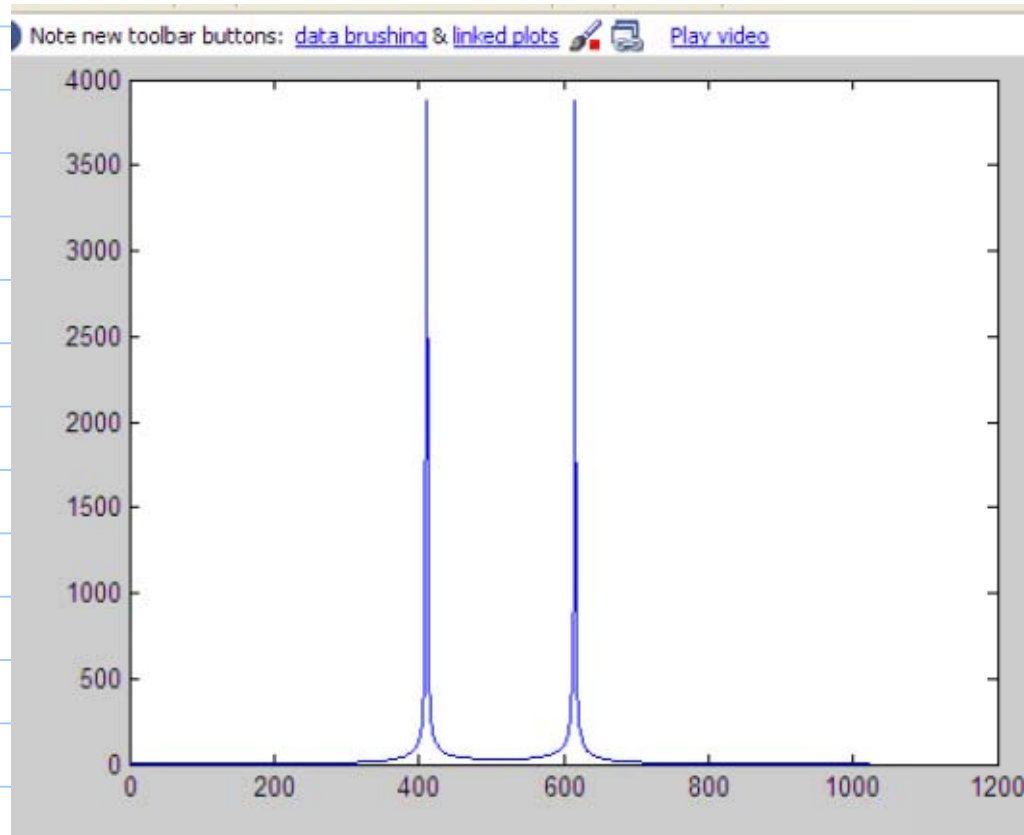
```
2.5133
```

```
>> N=1024;      % data length
>> n=0:N-1;    % time index
>> x=10*cos(w0*n+0.7); % data vector
>> whos
```

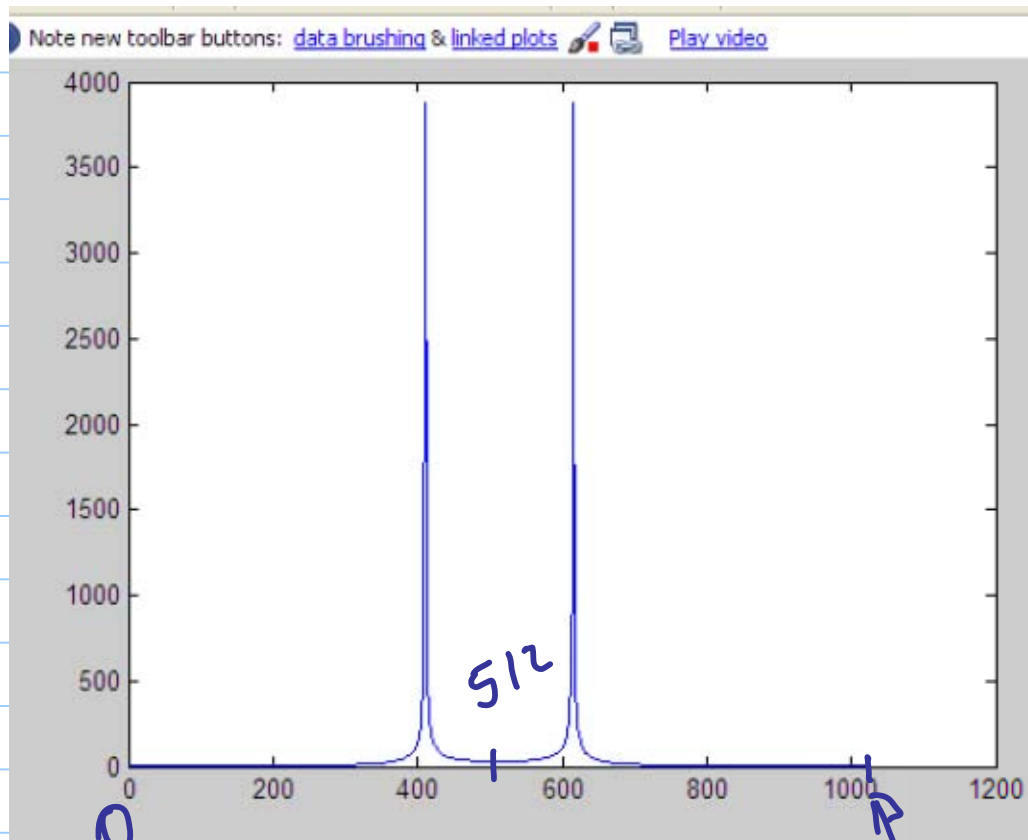
Name	Size	Bytes	Class	Attributes
F0	1x1	8	double	
Fs	1x1	8	double	
N	1x1	8	double	
n	1x1024	8192	double	
tout	1000x1	8000	double	
w0	1x1	8	double	
x	1x1024	8192	double	

```
fx >>
```

$|x[k]|$



$|X[k]|$



$$\omega = k \frac{2\pi}{N} =$$
$$= k \frac{2\pi}{1024}$$

0

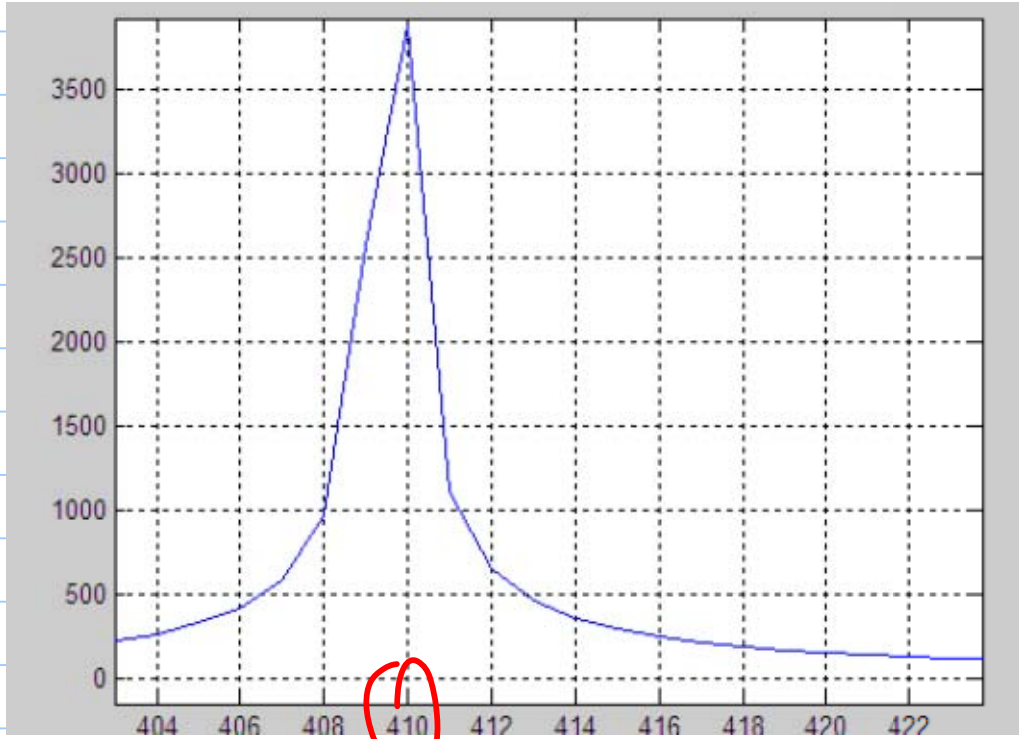
0

$\pi$

$k = 1023 = N - 1$

$2\pi \quad \omega$





①

$$k_0 = 410$$

$$\omega_0 = k_0 \frac{2\pi}{N} = 410 \times \frac{2\pi}{1024}$$

$$\omega_0 = 2.5157 \text{ rad}$$

$$\omega_0 = 2.5133 \text{ rad}$$