H1.1 Parts C and D

Contents

Reset the enviroment

```
clear all; close all;
```

Set up time and signals.

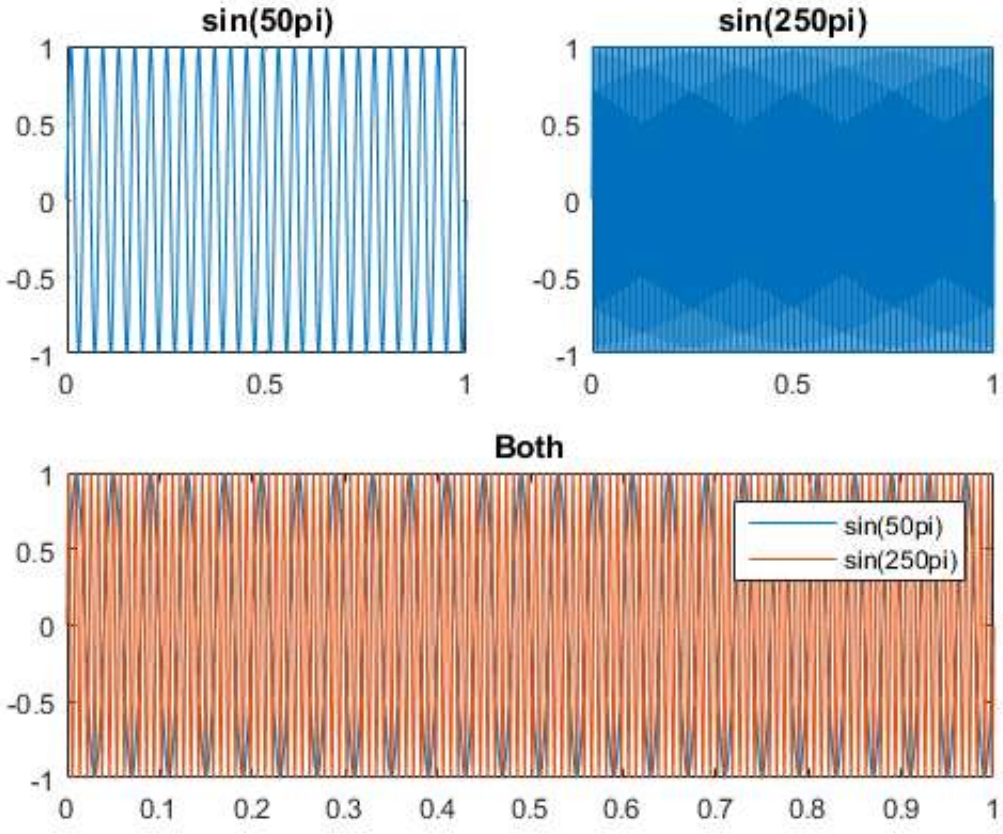
```
t=0:0.0001:1;

y = sin(25 * 2 * pi * t);
y2 = sin(125 * 2 * pi * t);
```

Down Sample it

```
y_s = y(1:100:end);
y2_s = y2(1:100:end);
t_s = t(1:100:end);
```

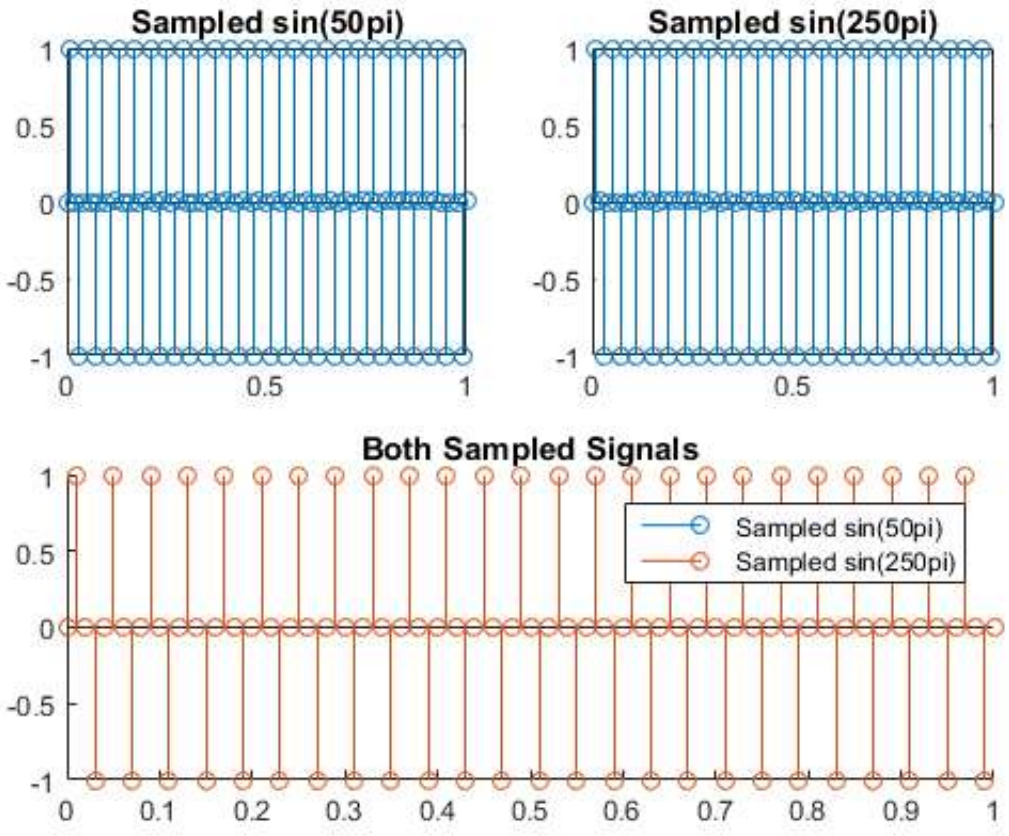
Plot the two originally

```
figure;
subplot(2,2,1)
plot(t, y)
title('sin(50pi)')
subplot(2,2,2)
plot(t, y2)
title('sin(250pi)')
subplot(2,2,[3,4])
plot(t, y, t, y2);
title('Both')
legend('sin(50pi)','sin(250pi)');
```



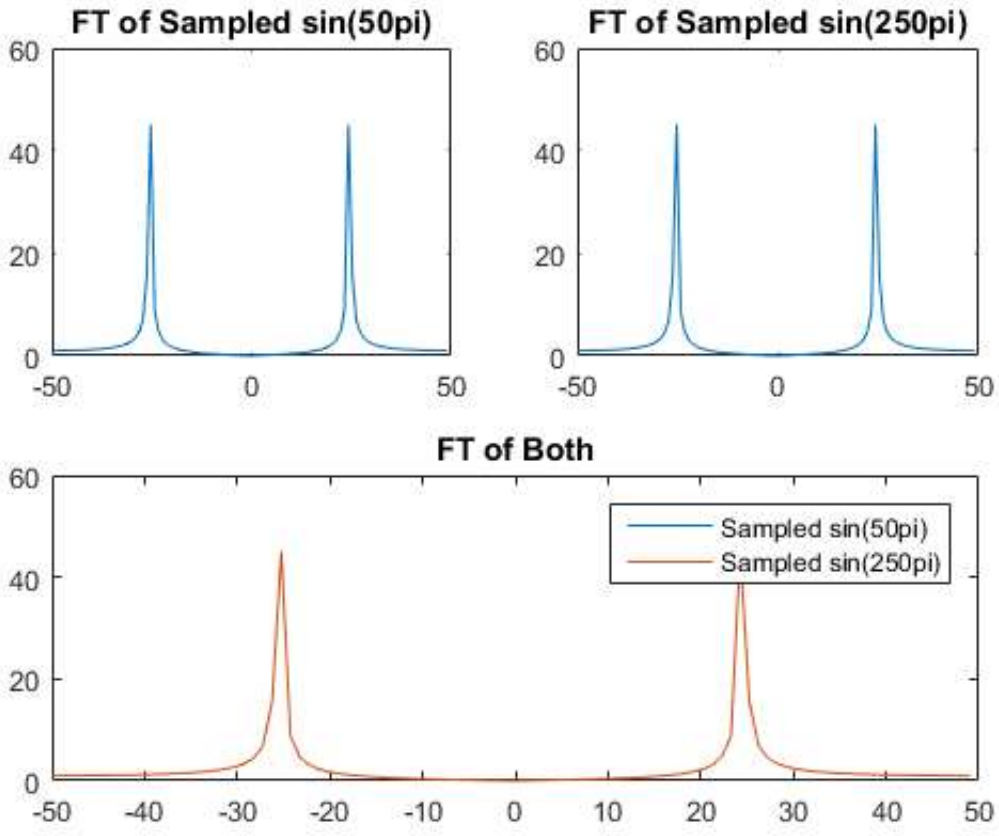
Plot the sampled ones

```
figure;
subplot(2,2,1)
stem(t_s,y_s);
title('Sampled sin(50pi)')
subplot(2,2,2)
stem(t_s,y2_s);
title('Sampled sin(250pi)')
subplot(2,2,[3,4])
hold on;
stem(t_s,y_s);
stem(t_s,y2_s);
title('Both Sampled Signals')
legend('Sampled sin(50pi)','Sampled sin(250pi)');
hold off;
```



Fourier Transform

```
ys_ft = fftshift(fft(y_s));
y2s_ft = fftshift(fft(y2_s));

n = length(y_s);
f = (-n/2:n/2-1)*(100/n);
figure;
subplot(2,2,1)
plot(f, abs(ys_ft))
title('FT of Sampled sin(50pi)')

subplot(2,2,2)
plot(f, abs(y2s_ft))
title('FT of Sampled sin(250pi)')

subplot(2,2,[3,4])
plot(f, abs(ys_ft),f, abs(y2s_ft));
title('FT of Both')
legend('Sampled sin(50pi)','Sampled sin(250pi)');
```



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