AMERICAN INTERNATIONAL UNIVERSITY BANGLADESH

Assignment Title:	Lab Report		
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Contents

Class Task

Composite signal in time domain & frequency domain

```
A=1;
B=9;
C=4;
D=1;
E=0;
F=3;
G=7;
H=2;
a1=(B+G+H);
a2=(C+E+H);
f1=(G+H+2);
f2=(E+F+H);
t=1:0.01:2;
signal_x = a1*sin(2*pi*f1*t) + a2*cos(2*pi*f2*t);
figure;
plot(t,signal_x);
xlabel("Time");
ylabel("Amplitude");
title("Composite Signal in time domain");
nx=length(t);
fsignal_x=fft(signal_x);
fsignal_x=fftshift(fsignal_x)/(nx/2);
fs=5000;
f=linspace(-fs/2,fs/2,nx);
figure;
```

plot(f,abs(fsignal_x),'linewidth',3);

xlabel("Frequency");

ylabel("Amplitude");
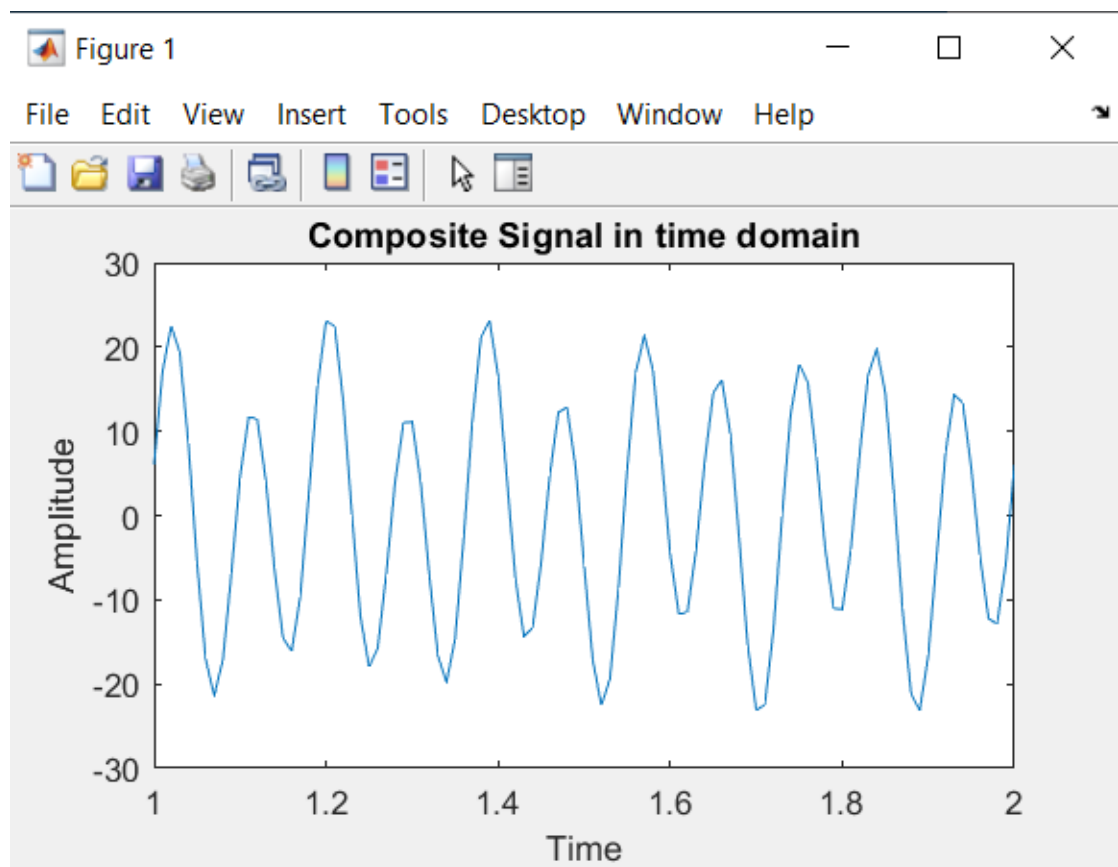
title("Composite Signal in Frequency domain");
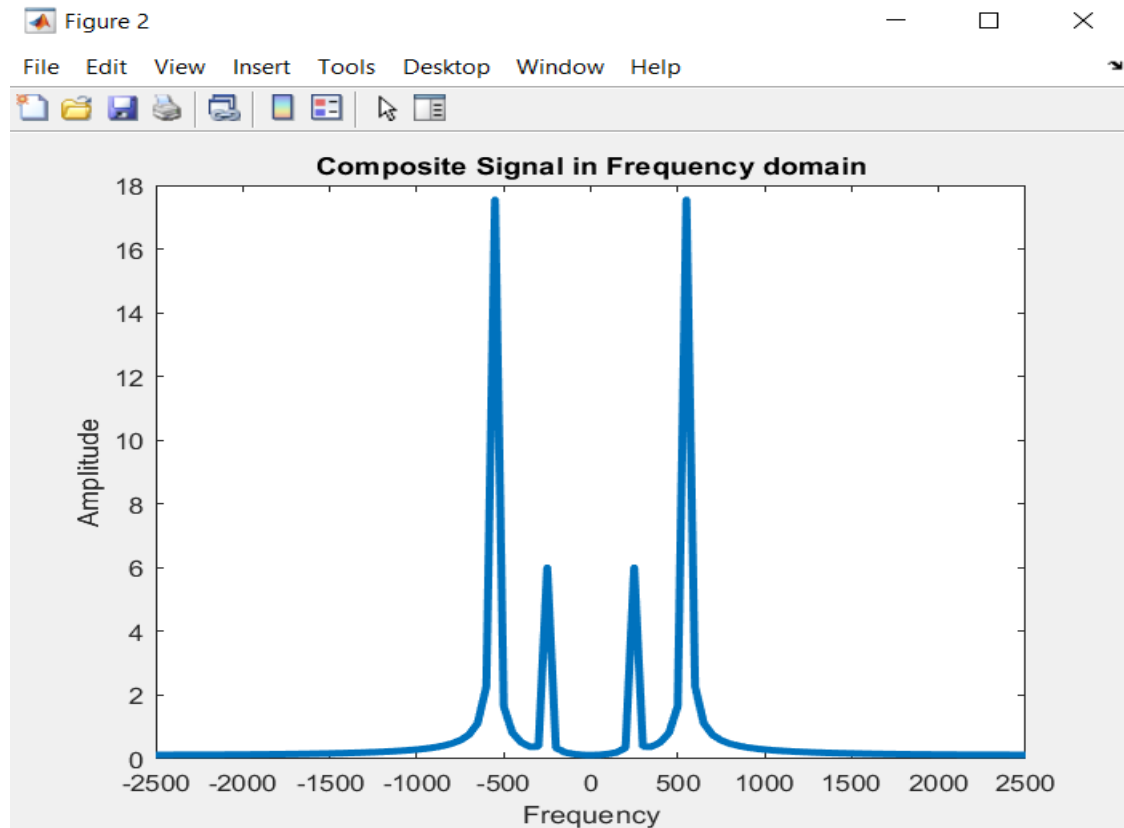

Figure 1: Composite signal in time domain

Figure 2: Composite signal in frequency domain

Performance task for lab report (a)

Composite signal of three simple signal in time domain & frequency domain using subplot.

A=1;

B=9;

C=4;

D=1;

E=0;

F=3;

G=7;

H=2;

a1=A+C+1;

a2=A+D+2;

```matlab
a3=A+E+1;
f1=A+E+1;
f2=A+D+2;
f3=A+C+1;
t=1:0.001:2;
x1=a1*cos(2*pi*f1*t);
x2=a2*sin(2*pi*f2*t);
x3=a3*cos(2*pi*f3*t);
signal_x=x1+x2+x3;
subplot(2,1,1);
plot(t,signal_x,'linewidth',3);
xlabel("Time");
ylabel("Amplitude");
title("Time Domain");
nx=length(t);
fsignal_x=fft(signal_x);
fsignal_x=fftshift(fsignal_x)/(nx/2);
fs=5000;
f=linspace(-fs/2,fs/2,nx);
subplot(2,1,2);
plot(f,abs(fsignal_x),'linewidth',3);
xlabel("Frequency");
ylabel("Amplitude");
xlim([-100 100]);
title("Frequency Domain");
```
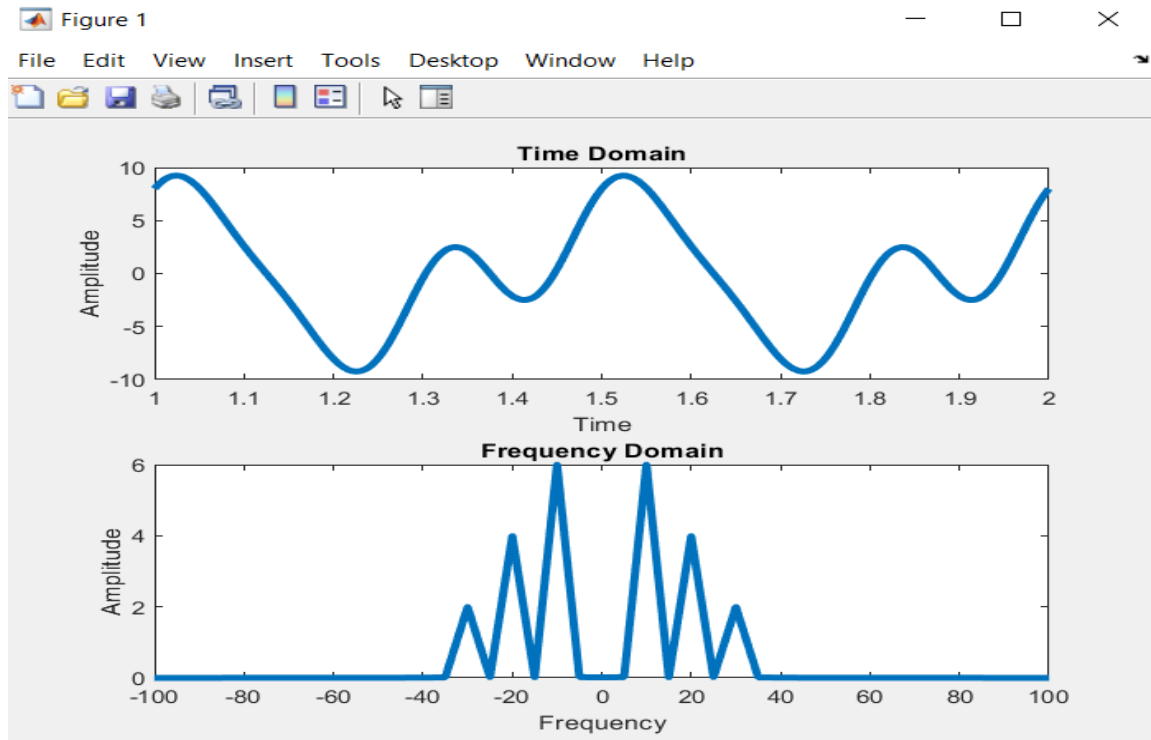
Figure 3: Composite signal in time and frequency domain using subplot

Performance task for lab report (b)

original signal and quantized signal design

A=1;

B=9;

C=4;

D=1;

E=0;

F=3;

G=7;

H=2;

a1=A+C+1;

a2=A+D+2;

a3=A+E+1;

```
f1=A+E+1;

f2=A+D+2;

f3=A+C+1;

t=1:0.001:2;

x1=a1*cos(2*pi*f1*t);

x2=a2*sin(2*pi*f2*t);

x3=a3*cos(2*pi*f3*t);

signal_x=x1+x2+x3;

partition=[-6, 0, 4];

codebook=[-9.23, -2, 2.488, 9.23];

[i,q] = quantiz(signal_x,partition,codebook);

figure

plot(t,signal_x,'x',t,q,'.');

xlim([1 1.35]);

legend('Original Signal','Quantized Signal');

title("Original signal and Quantized Signal");
```
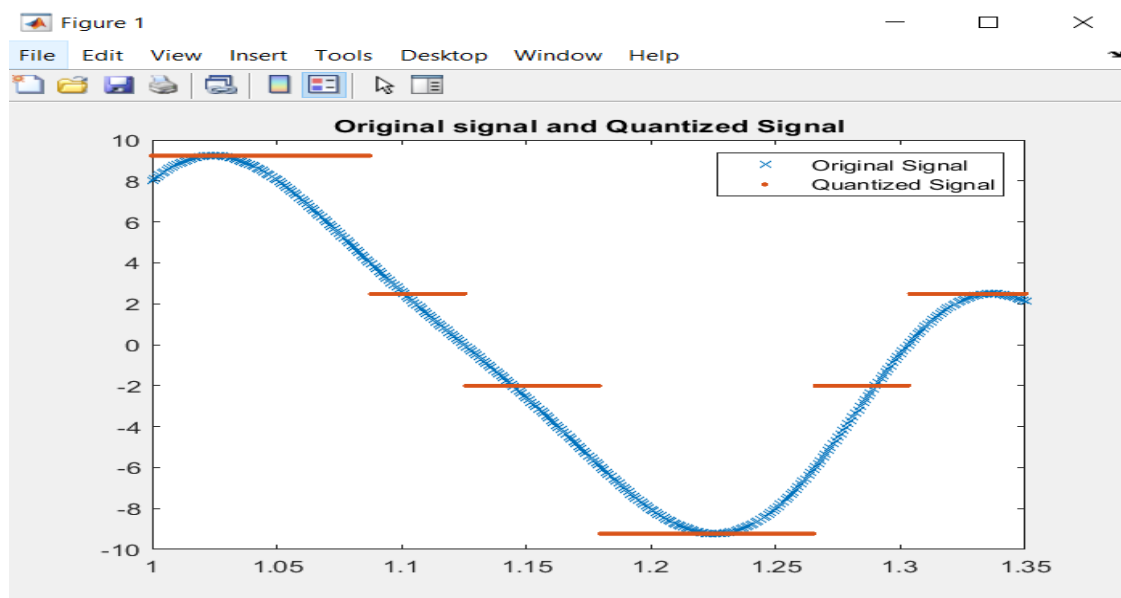

Figure 4: Quantized Signal