LAB #06

Implementation /Analysis of Frequency Modulated and Demodulated Signal using MATLAB

Fall 2023

CSE-402L Digital Signal Processing Lab

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Registration No.: 21PWCSE2028

Section: C

"On my honor, as a student of the University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work"

Submitted to:

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Tasks

Code:

```
fs = 1000; % Sampling Frequency
fc = 200;  % Carrier Frequency
t = (0:1/fs:0.2)';
fDev = 50;
FDev = 100;

x  = sin(2*pi*30*t) + sin(2*pi*60*t);

cs = sin(2*pi*fc*t);


hold on
plot(t,cs,"--"); %Carrier Signal
plot(t,x); %modulating Signal
xlabel('Time (s)')
ylabel('Amplitude')
legend('Carrier Signal','Modulating Signal')

y = fmmod(x,fc,fs,fDev);
figure;
plot(t,x,'r',t,y,'k--')
xlabel('Time (s)')
ylabel('Amplitude')
legend('Original Signal','Modulated Signal')

y = fmmod(x,fc,fs,FDev);
figure;
plot(t,x,'r',t,y,'k--')
xlabel('Time (s)')
ylabel('Amplitude')
legend('Original Signal','Modulated Signal')

z = fmdemod(y,fc,fs,fDev);
figure;
plot(t,x,'c',t,z,'b--');
xlabel('Time (s)');
ylabel('Amplitude');
legend('Original Signal','Demodulated Signal');
```

Output:

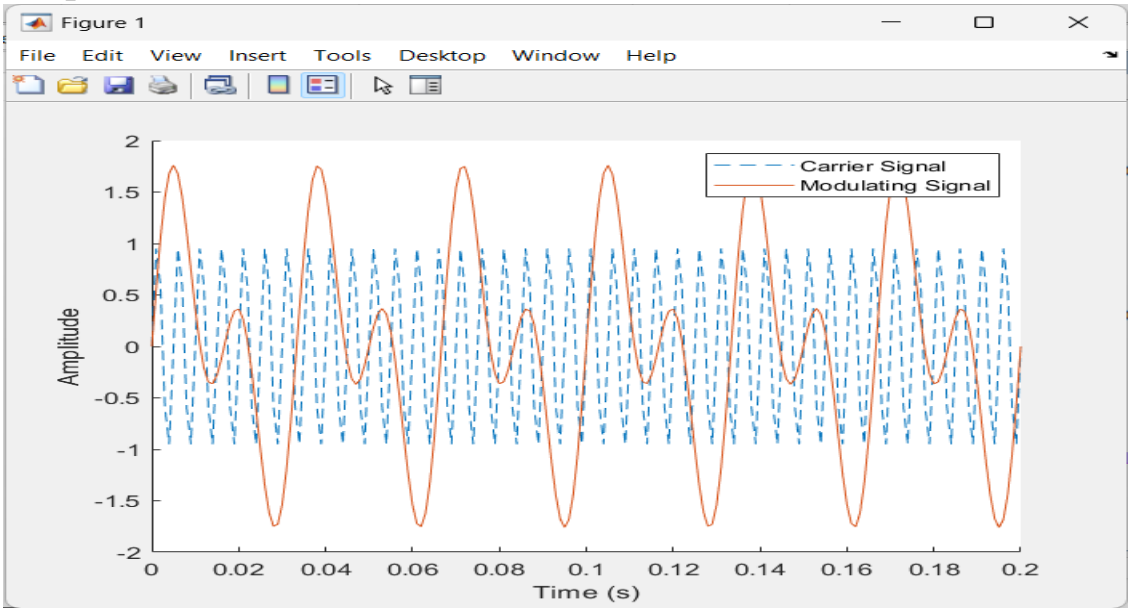


Figure 1
File Edit View Insert Tools Desktop Window Help
Carrier Signal
Modulating Signal
Amplitude
Time (s)

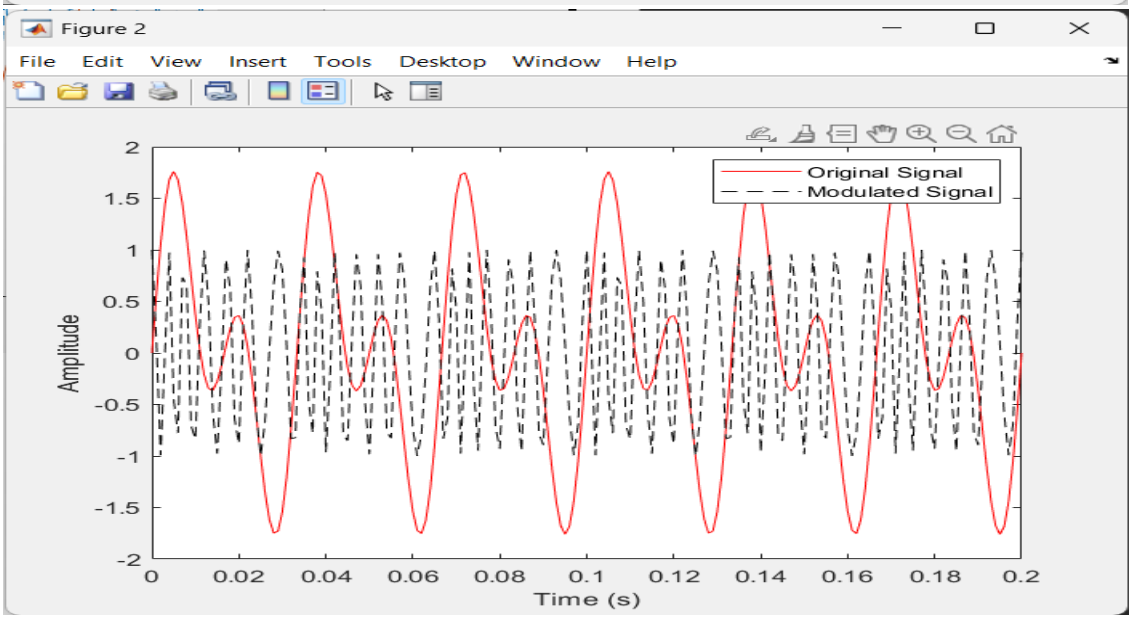
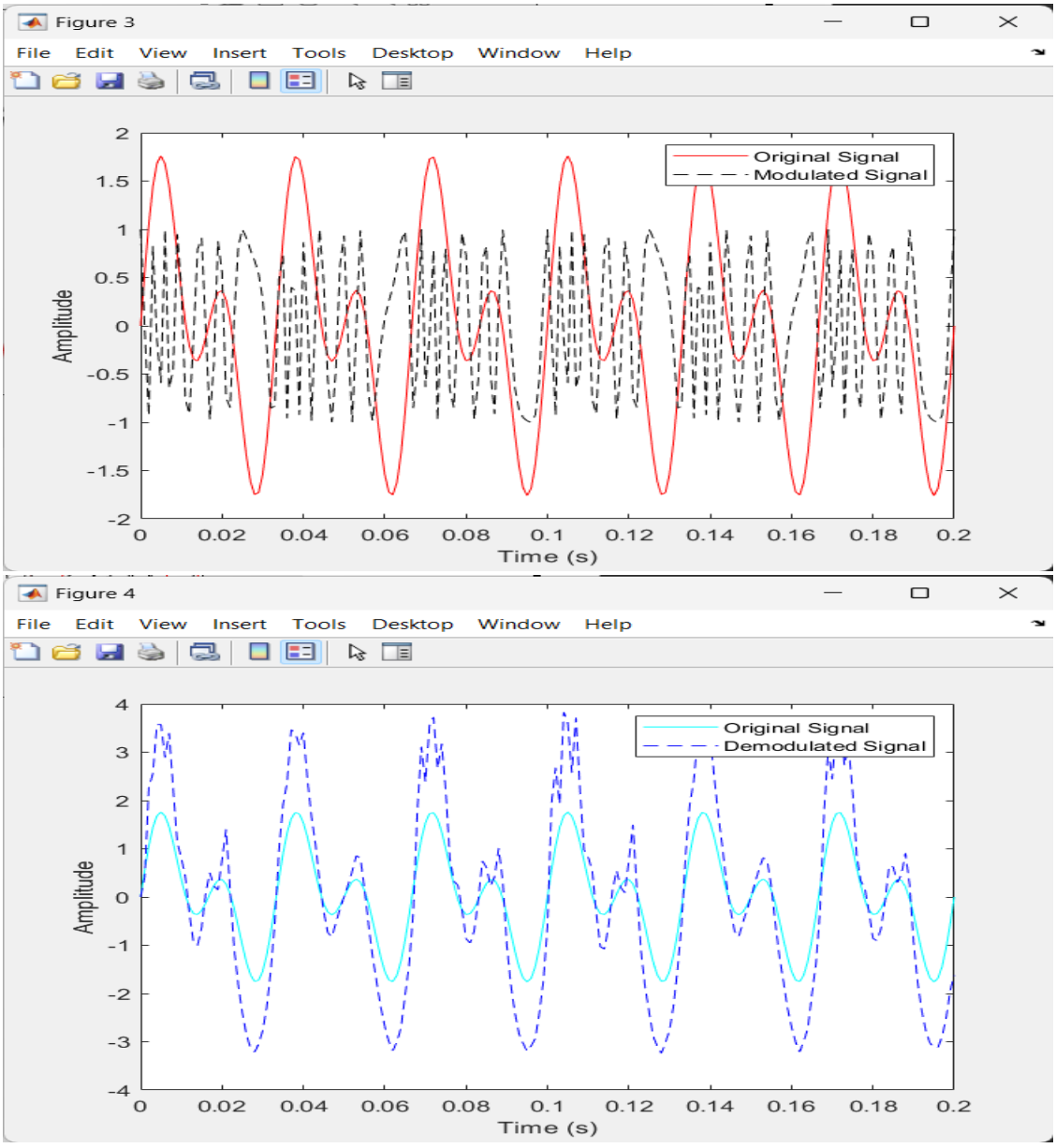


Figure 2
File Edit View Insert Tools Desktop Window Help
Original Signal
Modulated Signal
Amplitude
Time (s)



5. Observe Figure 1 and comment on the frequencies of both signals and why.
Comment: Original Signal is the combination of two frequencies which is 30 and 60 Hz while carrier signal is has frequency 200 Hz only