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% Name - Surag P
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% Experiment three

%Verification of signal sampling and reconstruction and
%study the effects of aliasing.

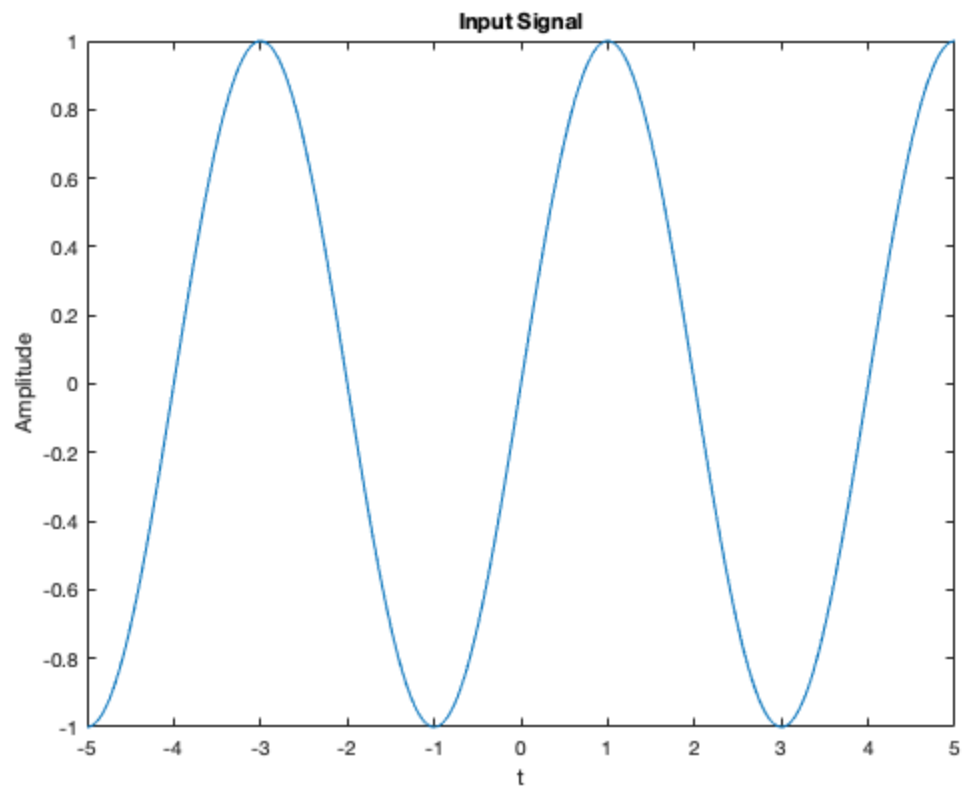
% Generating Sample Input Signals
clear
clc
t=-5:0.01:5;
T=4;
fm=1/T;
X=sin(2*pi*fm*t);
figure;
plot(t,X);
xlabel('t');
ylabel('Amplitude');
title('Input Signal');

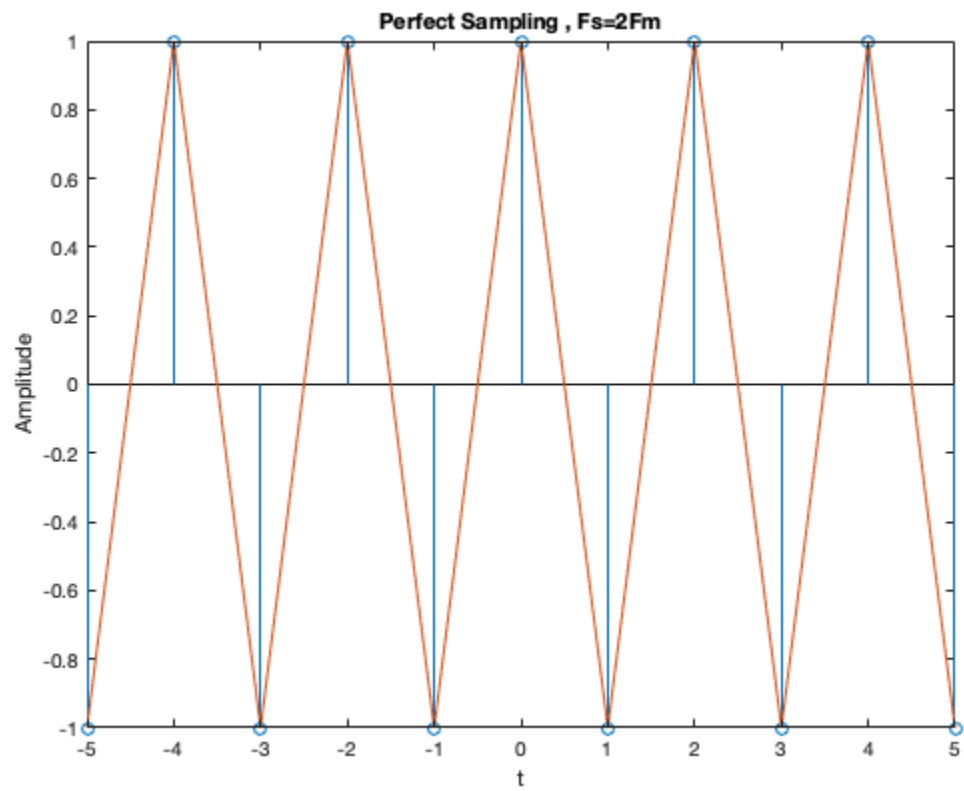
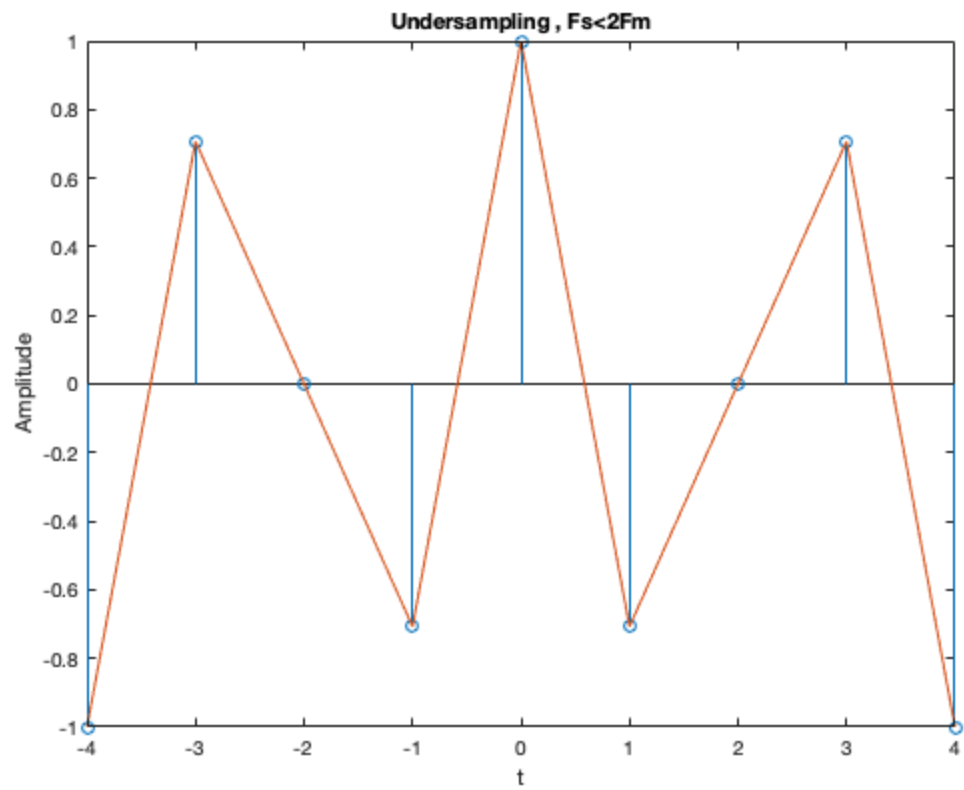
%Under Sampling , fs<2fm
fs1=1.6*fm;
n1=-4:1:4;
x1=cos(2*pi*fm/fs1*n1);
figure;
stem(n1,x1);
xlabel('n');
ylabel('Amplitude');
hold on;
plot(n1,x1);
xlabel('t');
ylabel('Amplitude');
title('Undersampling , Fs<2Fm');

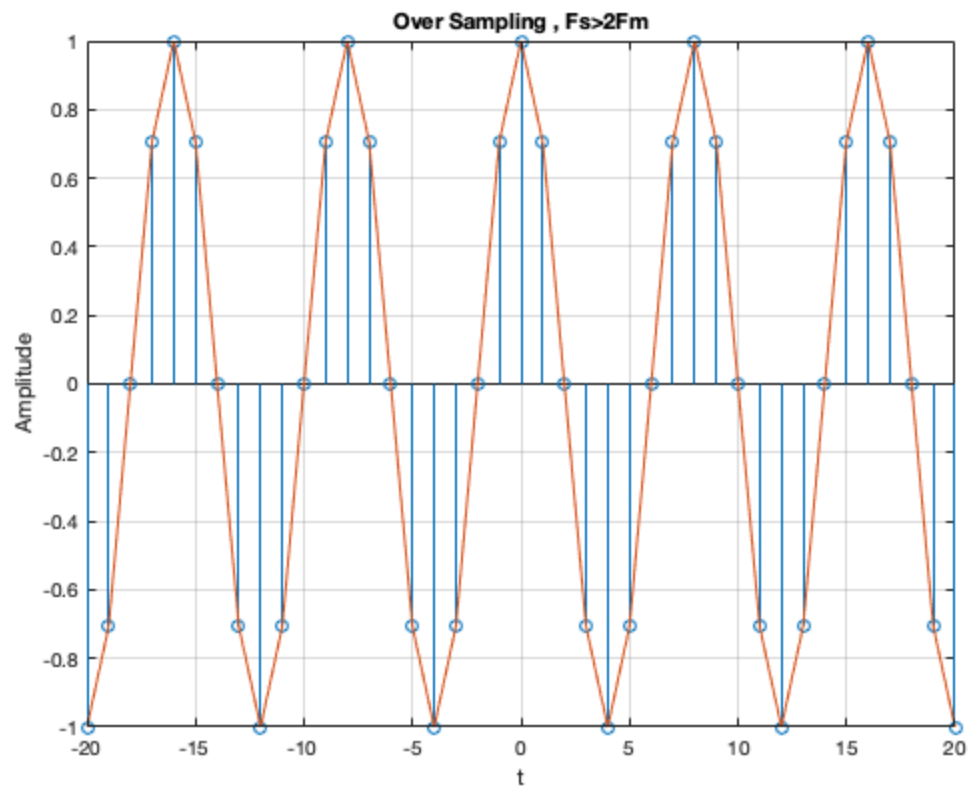
%Perfect Sampling , fs=2fm
fs2=2*fm;
n2=-5:1:5;
x2=cos(2*pi*fm/fs2*n2);
figure;
stem(n2,x2);
xlabel('n');
ylabel('Amplitude');
hold on;
plot(n2,x2);
xlabel('t');
ylabel('Amplitude');
title('Perfect Sampling , Fs=2Fm');

%Over Sampling , fs>2fm
fs3=8*fm;
n3=-20:1:20;
```

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x3=cos(2*pi*fm/fs3*n3);  
figure  
stem(n3,x3);  
hold on;  
plot(n3,x3);  
xlabel('n');  
ylabel('Amplitude');  
xlabel('t');  
ylabel('Amplitude');  
grid;  
title('Over Sampling , Fs>2Fm');
```







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