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% To verify sampling theorem in Matlab
% Demonstrate the effects of aliasing from improper sampling

fm = input("Enter the frequency: ");
t = 0:0.01:10;

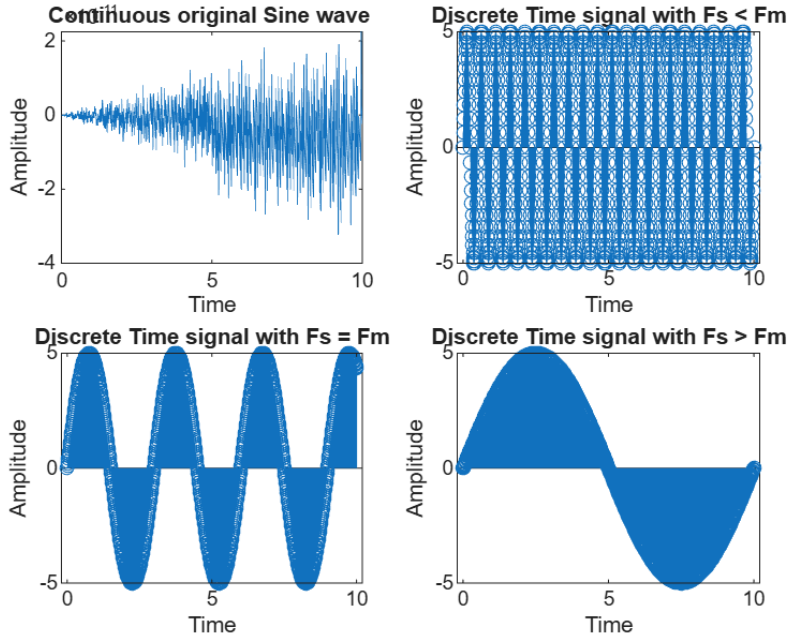
y = 5*sin(2*pi*t*fm);
subplot(2,2,1);
plot(t,y);
xlabel("Time");
ylabel("Amplitude");
title("Continuous original Sine wave ");

fs1 = 0.5*fm;
fs2 = 3*fm;
fs3 = 10*fm;

y1 = 5*sin(2*pi*t*(fm/fs1));
subplot(2,2,2);
stem(t,y1);
hold on;
xlabel("Time");
ylabel("Amplitude");
title("Discrete Time signal with Fs < Fm");

y2 = 5*sin(2*pi*t*(fm/fs2));
subplot(2,2,3);
stem(t,y2);
hold on;
xlabel("Time");
ylabel("Amplitude");
title("Discrete Time signal with Fs = Fm");

y3 = 5*sin(2*pi*t*(fm/fs3));
subplot(2,2,4);
stem(t,y3);
hold on;
xlabel("Time");
ylabel("Amplitude");
title("Discrete Time signal with Fs > Fm");
```


Continuous original Sine wave
Amplitude
Time
Discrete Time signal with Fs < Fm
Amplitude
Time
Discrete Time signal with Fs = Fm
Amplitude
Time
Discrete Time signal with Fs > Fm
Amplitude
Time