```matlab
% Himanshu Dixit 21103262 B11

sgtitle(['Himanshu Dixit (21103262) B11 - ' ...
    'Sampling & Reconstruction'], ...
 'FontSize',12, 'FontWeight', 'bold', 'HorizontalAlignment', ...
 'center', 'FontName', 'Times New Roman');

%Message Signal
Am=2;
fm=100;
tm=1/fm;
n_cycles=4;
t_time=n_cycles*tm;
t=0:0.001:t_time;
x=Am*sin(2*pi*fm*t);
subplot(3,1,1);
plot(t,x);
title('Message signal')
xlabel('t (sec)');
ylabel('x(t)');


%Sampling Signal
num_points=1000;
T=1/num_points;
ts = 0:T:t_time;
ns = 0:length(ts)-1;
x_samples = Am*sin(2*pi*fm/num_points*ns);
subplot(3,1,2);
xaxis=0:1:(length(x_samples)-1);
stem(xaxis,x_samples,'filled','r');
title('Sampled signal')
xlabel('n^{th} sample');
ylabel('x_s(n)');


%Reconstructed Signal
x_recon=0;
for k=0:length(x_samples)-1
 l=k:-1:-(length(t)-1)+k;
x_recon=x_recon+x_samples(k+1)*sinc(l);
end
subplot(3,1,3);
plot(t,x_recon);
title('Reconstructed signal')
xlabel('t (sec)');
ylabel('x_r(t)');
```
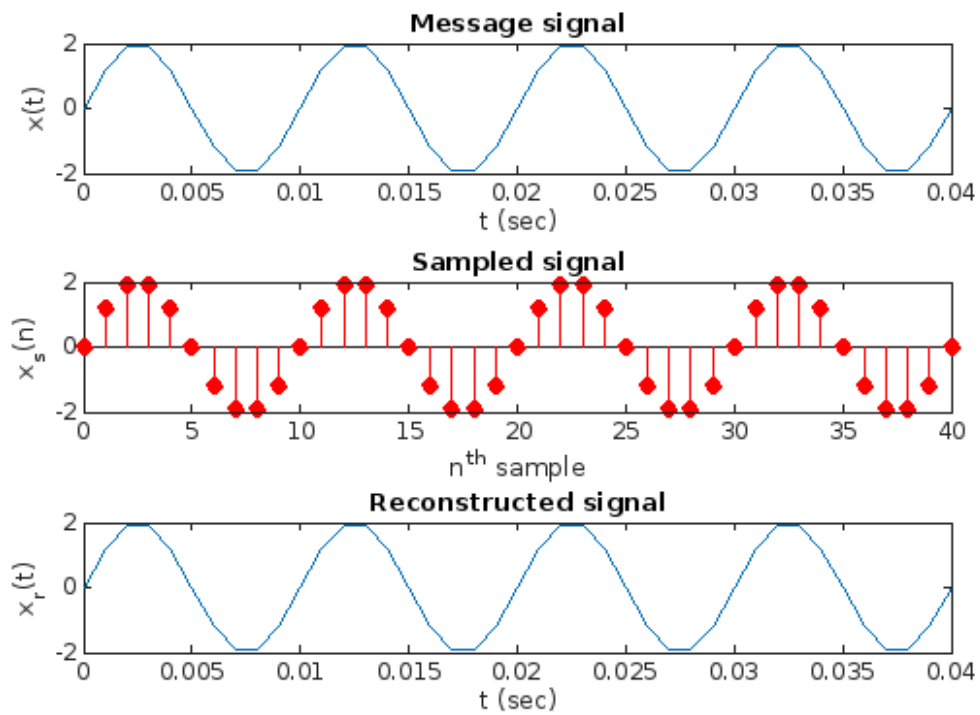
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