
```
close;
clear all;
t=0:0.001:0.5;
x1= 2*cos(31.415*t);
x2= 2*cos((31.415*t)+0.6283);
plot(t,x1,t,x2);
axis([0 0.5 -2.5 2.5]);
grid;
xlabel('time in (seconds)');
ylabel('x1(t)= A cos(2*pi*f*t) and x2(t)= A cos(2*pi*f*t + theta)');

%%Problem 2
clear all
clc
fs = 1;
t=linspace(0,10,500);
c1 = 3;
C2 = 4;
x = c1*cos(t) + C2*sin(t);
figure(1)
plot(t,x)
grid on
title('x(t)');
xlabel('Time')
ylabel('amplitude')

%PROBLEM 2B
fs = 10;
Time = 10;
c2=4;
t = 0:1/fs:Time;
x = c1*cos(t) + c2*sin(t);
A = 5;
th= -53.13*2*pi;
x2 = A*cos(t+th);
figure(2)
plot(t,x,'r')
hold on
plot(t,x2,'b')
grid on
legend('actual signal','modeled signal')
xlabel('Time')
ylabel('amplitude')

%problem 2c
fa = 440;
fs = 8192;
t = 0:1/fs:10;
xA = cos(2*pi*fa*t);
n = 1:4000;
xn = xA(1:length(n));
```

```
sound(xn)
%produces a beep sound

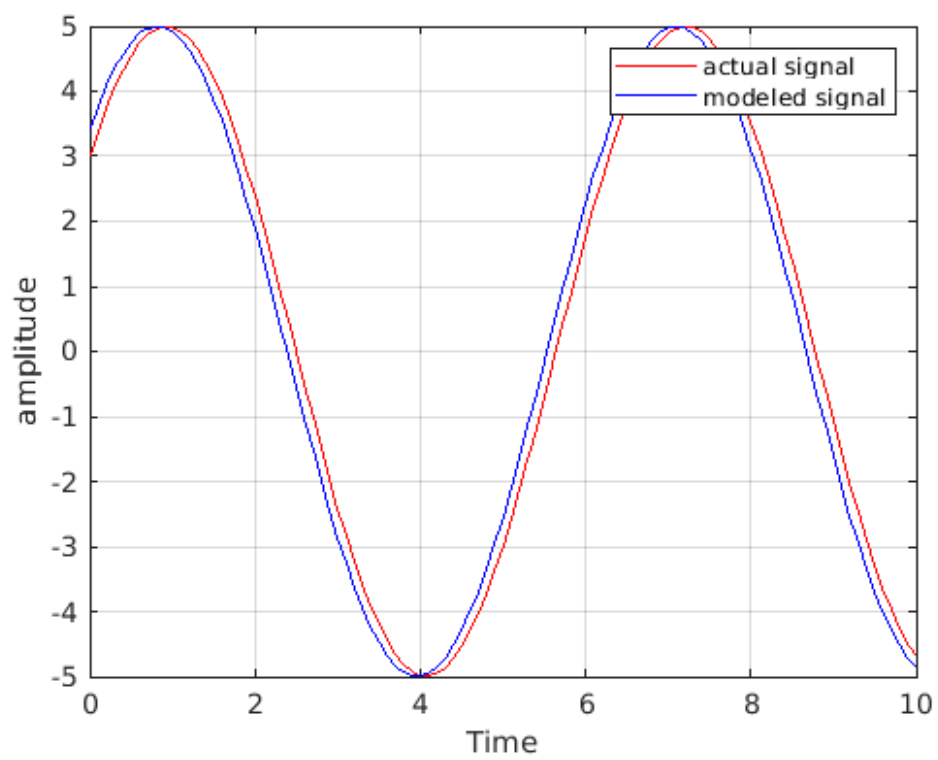
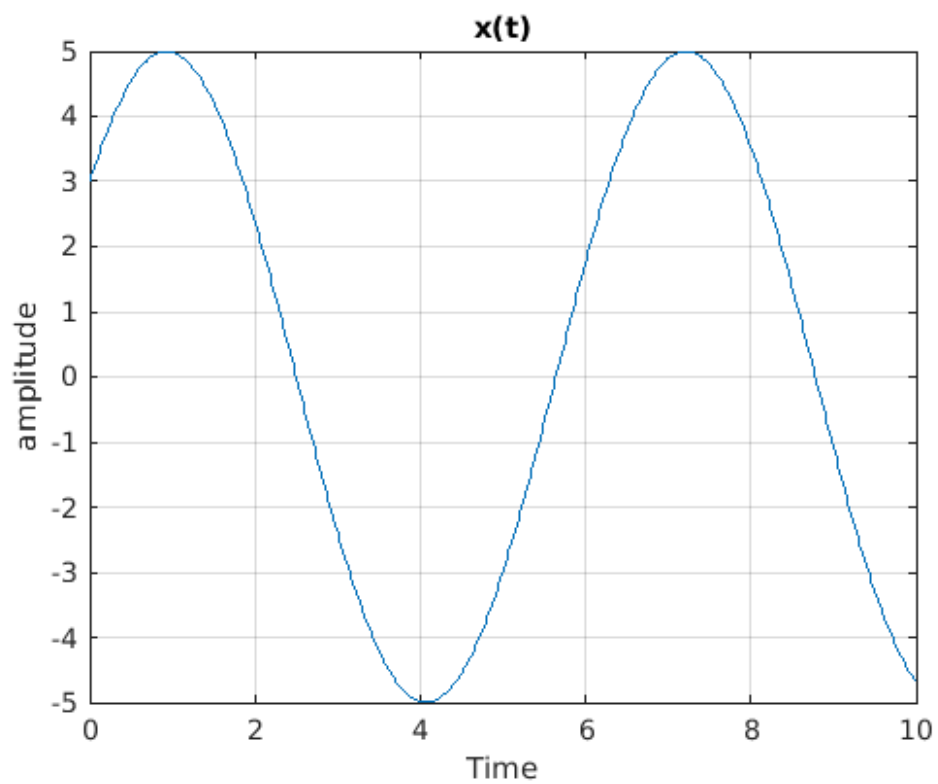
%problem d
figure(3)
fA = 440;
n=1:4000;
fs = 8192;
ts = 1/fs;
x(n) = cos(2*pi*fA*n*ts);
stem(n,xn)
grid on
xlabel('sample')
ylabel('amplitude')

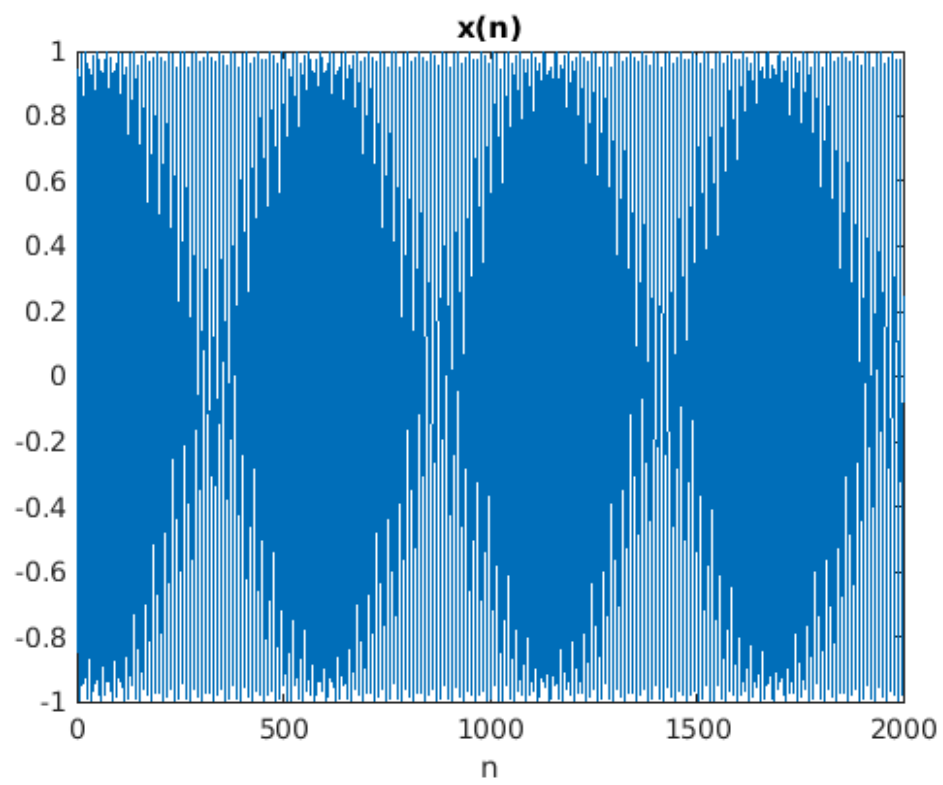
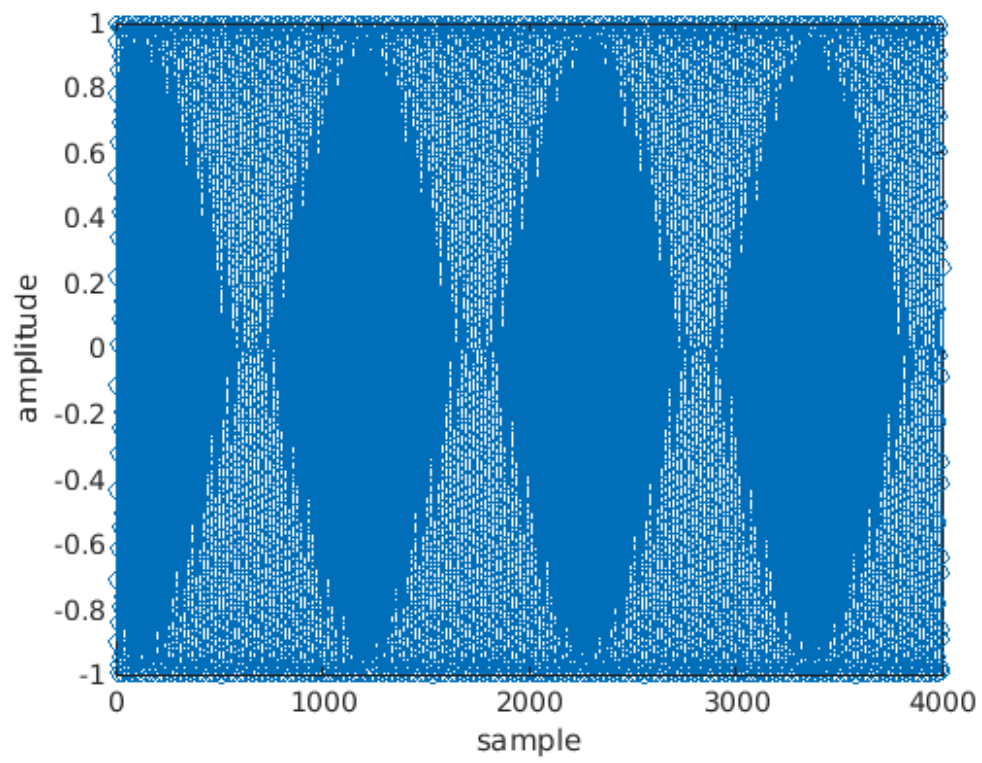
%problem e
figure(4)
fA = 440;
n=1:4000;
fs = 8192;
ts = 1/fs;
x(n) = cos(2*pi*fA*n*ts);
stem(n(1:100),xn(1:100))
grid on
xlabel('sample')
ylabel('amplitude')

%problem f
fA = 440;
n=1:4000;
fs = 8192;
ts = 1/fs;
x(n) = cos(2*pi*fA*n*ts);
plot(x(1:2:end));
title('x(n)');
xlabel('n');
sound(x(1:2:end));

%part 3

fs = 10000;
A = 1/2;
t = 0:1/fs:4;
f1 = 350;
f2 = 440;
v1 = A*sin(2*pi*f1*t);
v2 = A*sin(2*pi*f2*t);
d = v1 + v2;
soundsc(d)
pause(5)
```





part3 b

```
t1 = 0:1/fs:0.5;
f3 = 480;
f4 = 620;
b10 = A*sin(2*pi*f3*t1);
b11 = A*sin(2*pi*f4*t1);
b1 = b10 + b11;
z1 = zeros(1,5000);
b = 0;
for i=1:(length(z1)/4)
    b = [b b1(1,((i-1)*4+1):i*4) z1(1,((i-1)*4+1):i*4)];
end
soundsc(b)
pause(5)

%%part 3 c
t2 = 0:1/fs:2;
f5 = 440;
f6 = 480;
r10 = A*sin(2*pi*f5*t2);
r11 = A*sin(2*pi*f6*t2);

r1 = r10 + r11;

z2 = zeros(1,40000);
r = 0;
for i=1:(length(r1)/3)
    r = [r r1(1,((i-1)*3+1):i*3) z2(1,((i-1)*3+1):i*3)];
end
soundsc(r)
pause(5)
```

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