**labTask 01**

t = 0:.1:2\*pi

x=sin(t);

T=2\*pi;

%using command window

for k=1:10

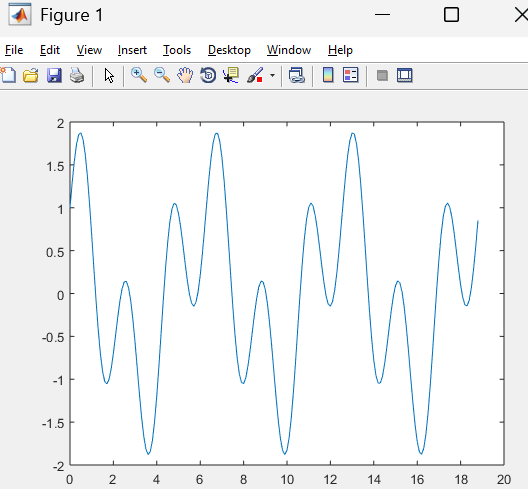
xk(k,:)=sin(t+k\*T)

end

**labTask 02**

t = 0:0.1:6\*pi;

x = cos(t) + sin(3\*t)

plot (t,x) 

**labTask 03**

subplot(311)

% Causal Signal (t >= 0)

t = 0:0.1:5;

x = t .\* exp(-t);

plot(t, x)

title('Causal Signal')

subplot(312)

% Anti-Causal Signal (t <= 0)

t = -5:0.1:0;

x = t .\* exp(-t);

plot(t, x)

title('Anti-Causal Signal')

subplot(313)

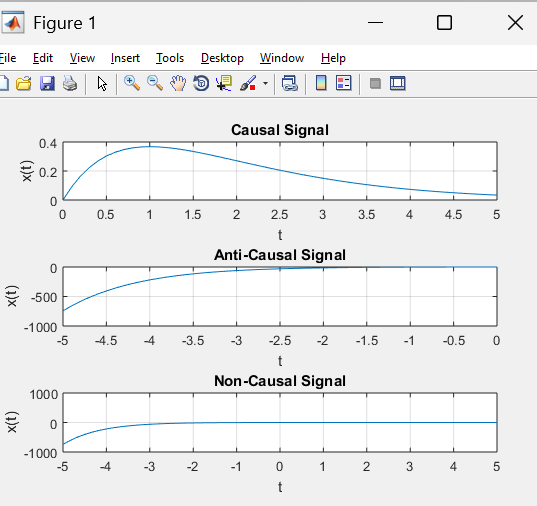
% Non-Causal Signal: x(t) = t\*exp(-t) for t from -5 to 5

t = -5:0.1:5;

x = t .\* exp(-t);

plot(t, x)

title('Non-Causal Signal')

****

x = -10:0.1:10;

y\_even = x.^2;

y\_odd = x.^3;

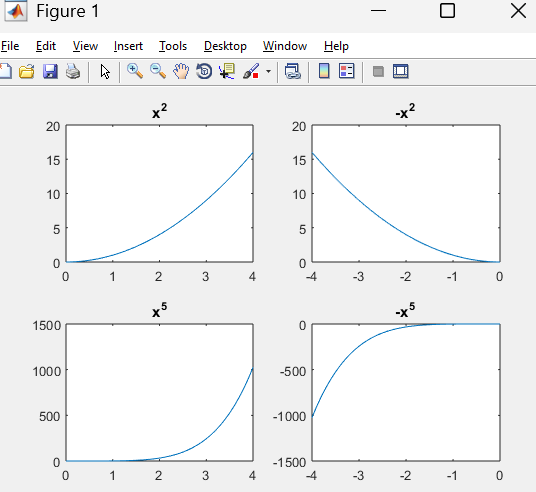
plot(x,y\_even)

figure

plot(x,flip(y\_even))

plot(x,y\_odd)

plot(x,-flip(y\_odd))



**labTask 05**

n = -113:113;

u = heaviside(n);

u\_neg = flip(u);

u\_even = (u + u\_neg) / 2;

u\_odd = (u - u\_neg) / 2;

u\_reconstructed = u\_even + u\_odd;

**labTask 06**

syms t T

x = heaviside(t);

d = int(abs(x)^2,t,-T,T)

Ex = limit(d,T,inf)

Px = limit( (1/(2\*T))\*d,T,inf)

**labTask 07**

syms t T

x = 2 \* cos(pi \* t);

enrg\_integral = int(x^2,t,0,2);

Ex =enrg\_integral

Px = Ex / 2

**labTask 08**

t = -1:0.1:3;

% x(t)

x\_t = t .\* exp(-t);

% x(-t)

x\_neg\_t = (-t) .\* exp(t);

% Plot both signals

figure;

subplot(211);

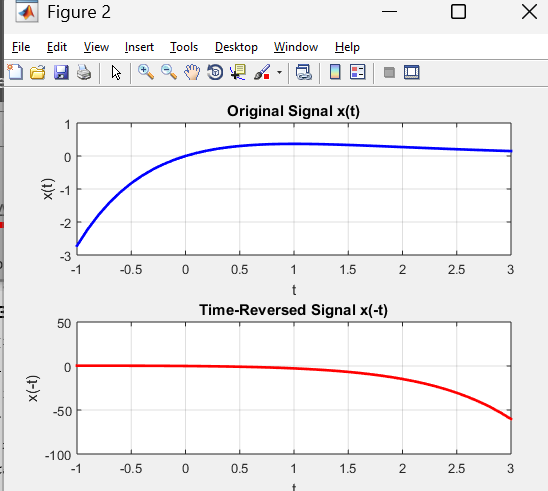
plot(t, x\_t);

title('Original Signal x(t)');

subplot(212);

plot(t, x\_neg\_t);

title('Time-Reversed Signal x(-t)');



**labTask 09**

t = -1:0.01:3;

x\_t = t .\* exp(-t); % Original signal x(t)

% Time compression (a = 2): x1(t) = x(2t)

x1\_t = (2\*t) .\* exp(-2\*t); % \*2 with t

% Time expansion (a = 0.5): x2(t) = x(0.5t)

x2\_t = (0.5\*t) .\* exp(-0.5\*t); % \*0.5 with t

% Plot the original and scaled signals

figure;

subplot(311);

plot(t, x\_t);

title('Original Signal x(t)');

subplot(312);

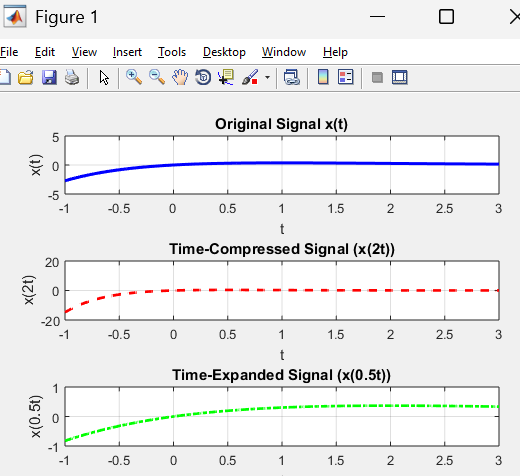
plot(t, x1\_t);

title('Time-Compressed Signal (x(2t))');

subplot(313);

plot(t, x2\_t);

title('Time-Expanded Signal (x(0.5t))');



**labTask 10**

t=-1:.01:3;

x\_t = t .\* exp(-t);

x1\_t = (t - 2) .\* exp(-(t - 2)); % put t = t-2

x2\_t = (t + 3) .\* exp(-(t + 3)); % put t = t+3

subplot(311)

plot(t,x\_t);

subplot(312)

plot(t,x1\_t,);

subplot(313)

plot(t,x2\_t);

