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% NAME-Yogesh
% ROLL no-181EC155

% SIMULATION OF DATA REFORMATING BY LINE CODING TECHNIQUES
clc;
close all;
clear all;
%Bit Sequence
bits = [1 0 1 0 1 1 1 0 1 0 0 0 0 1];
% bit rate = bits per second
bitrate = 2;
%time needed to transmit full sequence
T = length(bits)/bitrate;
n = 100;
N = n*length(bits);
Dt = T/N;
t = 0:Dt:T;

% UNRZ Encoding-----
figure;
% output signal
x = zeros(1,length(t));
for i = 0:length(bits)-1
    if bits(i+1) == 1
        x(i*n+1:(i+1)*n) = 1;
    else
        x(i*n+1:(i+1)*n) = 0;
    end
end

plot(t,x,'LineWidth',3);
axis([0 t(end) -0.1 1.1])
grid on;
title(['Unipolar NRZ coded sequence: [' num2str(bits) ']']);

% URZ-----
figure;
%defining output signal
x = zeros(1,length(t));
for i = 0:length(bits)-1
    if bits(i+1) == 1
        x(i*n+1:(i+1/2)*n) = 1;
        x((i+1/2)*n +1:(i+1)*n) = 0;
    else
        x(i*n+1:(i+1)*n) = 0;
    end
end

plot(t,x,'LineWidth',3);
axis([0 t(end) -0.1 1.1])
grid on;
title(['Unipolar RZ coded sequence: [' num2str(bits) ']']);

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% PRZ-----
figure;
%defining output signal
x = zeros(1,length(t));
for i = 0:length(bits)-1
    if bits(i+1) == 1
        x(i*n+1:(i+1/2)*n) = 1;
        x((i+1/2)*n:(i+1)*n) = 0;
    else
        x(i*n+1:(i+1/2)*n) = -1;
        x((i+1/2)*n:(i+1)*n) = 0;
    end
end

plot(t,x,'LineWidth',3);
axis([0 t(end) -1.1 1.1])
grid on;
title(['Polar RZ coded sequence: [' num2str(bits) ']']);

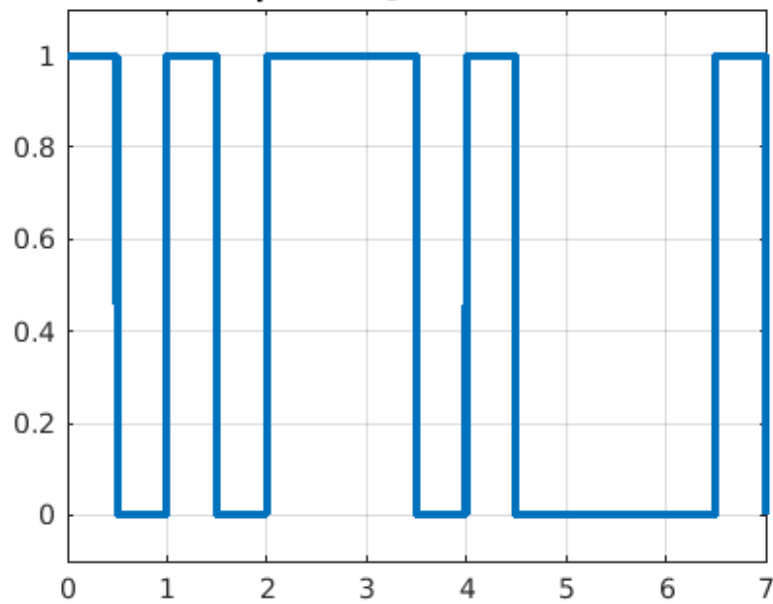
% Mancheste-----
figure;
x = zeros(1,length(t));
for i = 0:length(bits)-1
    if bits(i+1) == 1
        x(i*n+1:(i+1/2)*n) = -1;
        x((i+1/2)*n:(i+1)*n) = 1;
    else
        x(i*n+1:(i+1/2)*n) = 1;
        x((i+1/2)*n:(i+1)*n) = -1;
    end
end

plot(t,x,'LineWidth',3);
axis([0 t(end) -1.1 1.1])
grid on;
title(['Manchester coded sequence: [' num2str(bits) ']']);

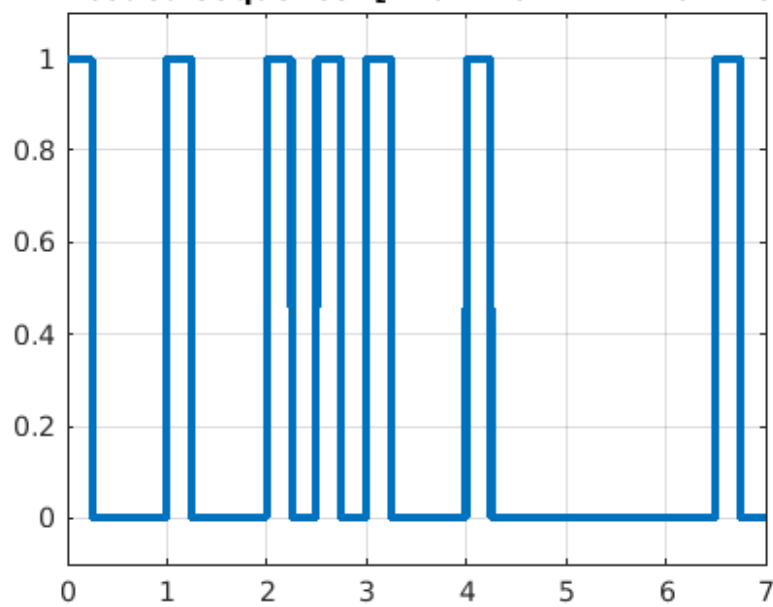
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**Polar NRZ coded sequence: [1 0 1 0 1 1 1 0 1 0 0]**

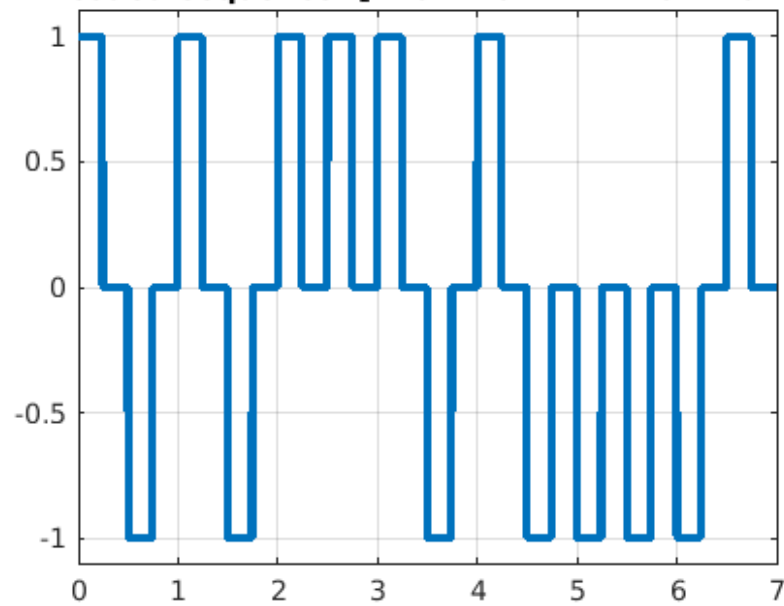


**Polar RZ coded sequence: [1 0 1 0 1 1 1 0 1 0 0 0]**

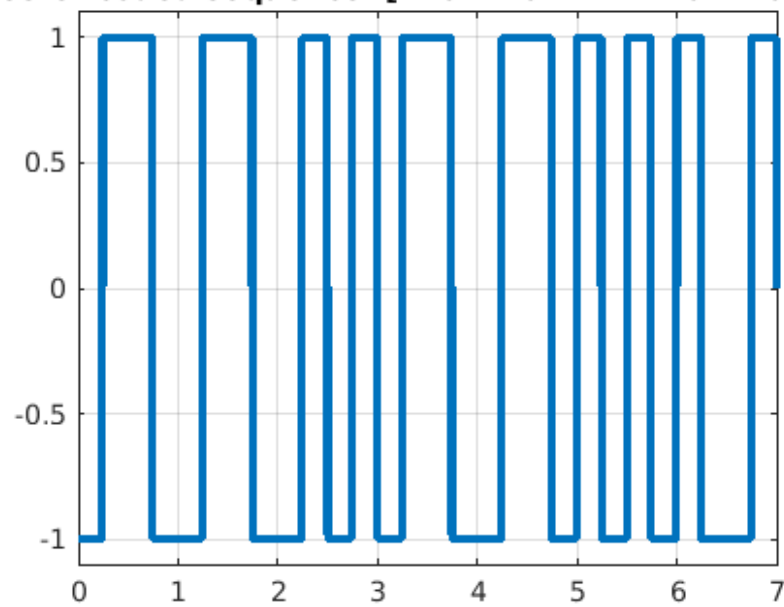


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**lar RZ coded sequence: [1 0 1 0 1 1 1 0 1 0 0 0]**



**chester coded sequence: [1 0 1 0 1 1 1 0 1 0 0 0]**



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