Experiment 5

Aim - Fourier Series Representation of Discrete and Continues Time Signal

Code -

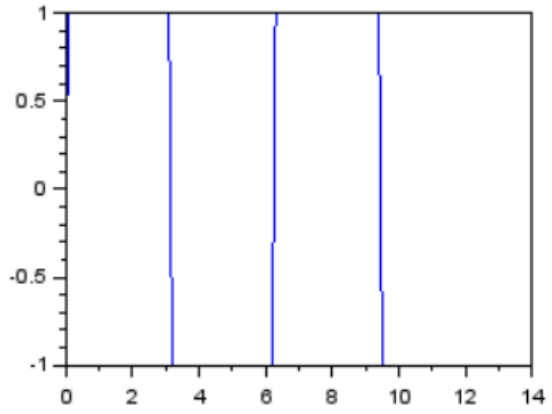
```
clc;
clear;
clf;
disp("Ankit Krish | 13551");
disp("Fourier Series Representation of Discrete Time Signal");

T = 2 * %pi;
t = 0:0.1:2*T;
N = 100;
square_wave = sign(sin(t));

function y=fourier_series(waveform, T, N, t)
    y = zeros(1, length(t));
    a0 = (1/T)*sum(waveform)*(t(2)-t(1));
    for n = 1:N
        an = (2/T)*sum(waveform .* cos(n*%pi*t/T))*(t(2)-t(1));
        bn = (2/T)*sum(waveform .* sin(n*%pi*t/T))*(t(2)-t(1));
        y = y + an*cos(n*%pi*t/T) + bn*sin(n*%pi*t/T);
    end
    y = a0/2 + y;
endfunction

fourier_square = fourier_series(square_wave, T, N, t);

subplot(221)
plot(t,square_wave)
subplot(222)
plot(t, fourier_square)
subplot(223)
plot2d3(t,square_wave)
subplot(224)
plot2d3(t, fourier_square)
```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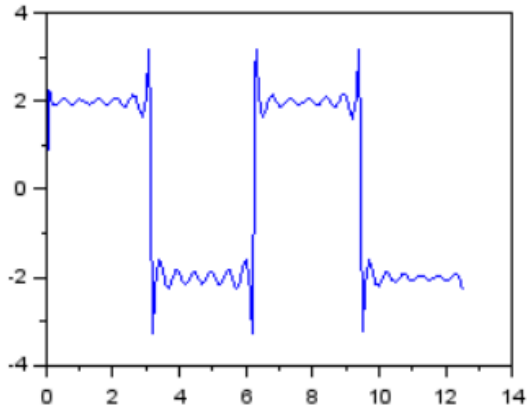
0 2 4 6 8 10 12 14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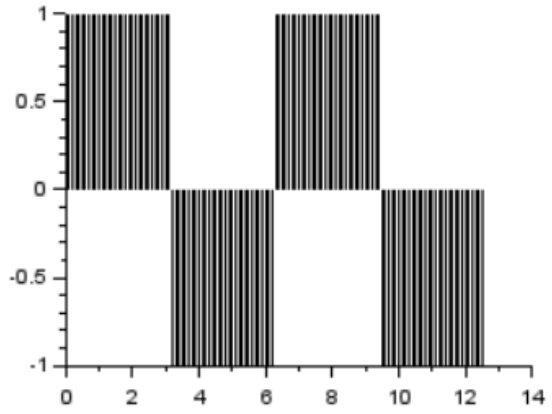
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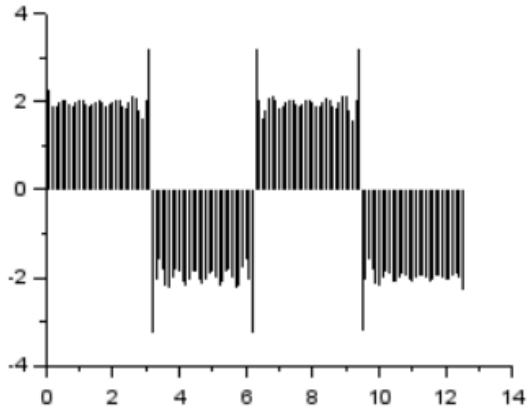
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