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clear all

clc

%Using inbuilt functions.

x\_n = 0:10:100;

y = dct(x\_n);

subplot(2,3,1);

stem(x\_n);

title('Signal')

xlabel('n')

ylabel('x\_n')

subplot(2,3,2);

stem(x\_n,y);

title('DCT')

xlabel('n')

ylabel('X\_k')

x1 = int16(length(x\_n)/2);

y1 = y(1:x1);

rx\_n = idct(y1);

subplot(2,3,3);

stem(rx\_n);

title('IDCT')

xlabel('n')

ylabel('rx\_n')

%Using formula.

%DCT

x\_k = zeros(1,11);

N = 11;

for k = 1:11

for n = 1:11

if k==1

x\_k(k) = x\_k(k) + sqrt(1/N)\*x\_n(n)\*cos((2\*(n-1)+1)\*(k-1)\*pi/(2\*N));

else

x\_k(k) = x\_k(k) + sqrt(2/N)\*x\_n(n)\*cos((2\*(n-1)+1)\*(k-1)\*pi/(2\*N));

end

end

end

subplot(2,3,4);

stem(x\_n);

title('Signal')

xlabel('n')

ylabel('x\_n')

subplot(2,3,5);

stem(x\_n,x\_k);

title('DCT')

xlabel('n')

ylabel('X\_k')

%IDCT

rx\_n1 = zeros(1,11);

for n = 1:11

for k = 1:11

if n==1

rx\_n1(n) = rx\_n1(n) + sqrt(1/N)\*x\_k(k)\*cos((2\*(k-1)+1)\*(n-1)\*pi/(2\*N));

else

rx\_n1(n) = rx\_n1(n) + sqrt(2/N)\*x\_k(k)\*cos((2\*(k-1)+1)\*(n-1)\*pi/(2\*N));

end

end

end

subplot(2,3,6);

stem(rx\_n1);

title('IDCT')

xlabel('n')

ylabel('rx\_n')