

```

clear all;
close all;
clc;

N = input('Enter the number of samples: ');
Xk = input('Enter the input sequence: ');
L = length(Xk);

if (N < L)
    error('N should be greater than or equal to L');
end

Xk = [Xk zeros(1, N-L)];
xn = zeros(1,N);

% IDFT Calculation
for n = 0:N-1
    for k = 0:N-1
        xn(n+1) = xn(n+1) + Xk(k+1) * exp(1j * 2 * pi * k * n / N);
    end
end

% Divide by N (IDFT Scaling)
xn = xn/N;

% Show final x(n)
disp('Final IDFT output x(n):');

Final IDFT output x(n):

```

```
disp(xn)
```

```
6.2500 + 0.0000i -1.2500 - 1.0000i -0.7500 + 0.0000i -1.2500 + 1.0000i
```

```
% Plot results
n = 0:N-1;
subplot(3,1,1);
stem(n, xn);
```

Warning: Using only the real component of complex data.

```

xlabel('n');
ylabel('x(n)');
title('IDFT plot of given sequence');
grid on;

subplot(3,1,2);
stem(n,abs(xn));
xlabel('n');
ylabel('|X(n)|');
title('Magnitude of IDFT Output');
grid on;
```

```

subplot(3,1,3);
stem(n,angle(xn));
xlabel('n');
ylabel('∠X(n)');
title('Phase plot of IDFT Output');
grid on;

```

