

MATLAB Code :

```
n = 0:6;
x = [4 6 2 1 7 4 8];
a = fft(x);
mag = abs(a);
pha = angle(a);
subplot(2,1,1);
plot(mag);
grid on
title('Magnitude Response');
subplot(2,1,2);
plot(pha);
grid on
title('phase Response');
```

LAB TASKS:

Task 1. Determine the Fourier transform of the following sequence. Use the FFT (Fast Fourier Transform) function,

$$x(n) = \{4 \ 3 \ 2 \ 1 \ 1 \ 2 \ 3 \ 4\}$$

Task 2. Compute the discrete Fourier transform of the following function analytically and then

Plot the magnitude and phase. Taking $w = [0:500]*\pi/500$;

$$x(n) = 3(0.9)^n u(n)$$

Its DTFT is given as:

$$\frac{3}{1 - 0.9 e^{-jw}}$$

Task 3. Given below is the frequency response of the system,

$$H(e^{jw}) = \frac{1+e^{-jw}}{1-e^{-jw}+0.9e^{-j2w}}$$

Write a MATLAB code that manually implements the above system.

Taking $w = -4*\pi:8*\pi/511:4*\pi$;