Exercise 3.1

Given the following sequence:

$$x(n) = \begin{cases} 10 & \text{for } n = 0 \\ 0 & \text{for } n = 1 \\ 0 & \text{for } n = 2 \\ -10 & \text{for } n = 3 \\ 0 & \text{for } n = 4 \end{cases}$$

Calculate a 5-point Discrete Fourier Transform (DFT) of the sequence $x(n)$. Determine the amplitude, phase and power spectrum for $X(m)$. Please do the calculation from scratch.

Exercise 3.2

Calculate the IDFT of the sequence in frequency domain $X = [10,\ 2 + j,\ 0,\ 2 - j]$ for time domain signal $x(n)$.