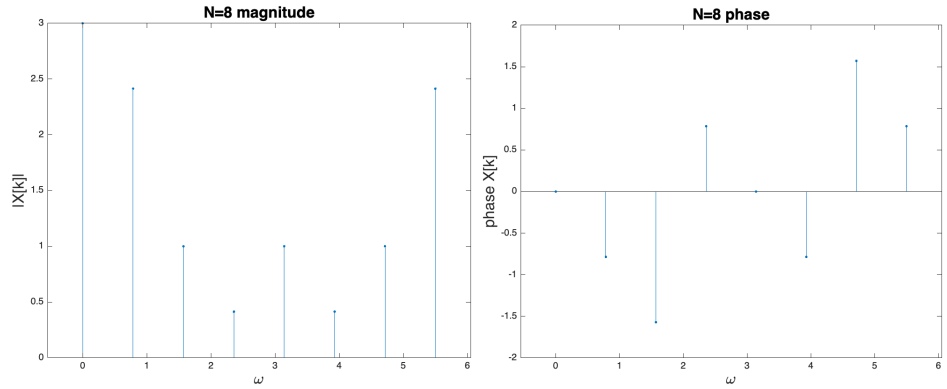
Lab 5

Problem 1: Plotting DTFS coefficients

In this problem, we consider the periodic signal $x[n]$ with period N. Across its period,

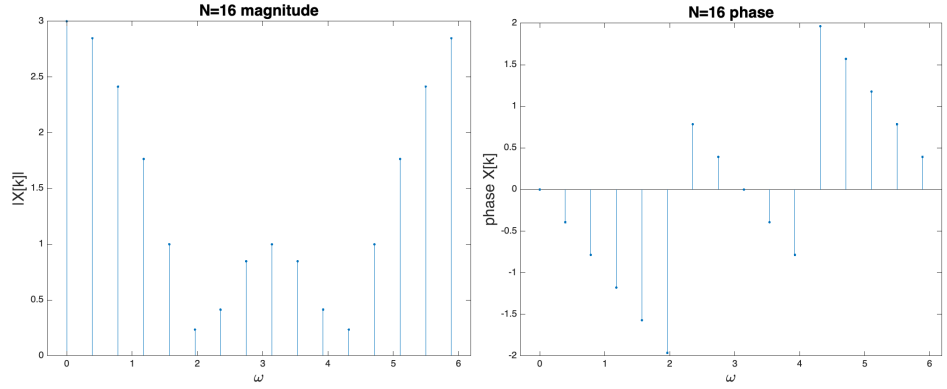
$$x[n] = \begin{cases} 1 & \text{if } n \geq 0 \text{ and } n < 4. \\ 0 & \text{else.} \end{cases} \tag{1}$$

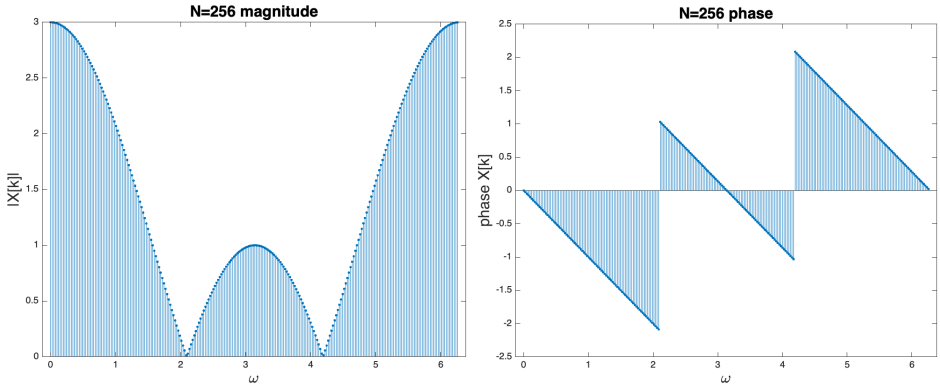
a) We begin by computing the DTFS coefficients of this signal for $N = 8$, and plot its magnitude and phase.



<MINTED>

b) We can then repeat part **a)** with $N = 16$ and $N = 256$, the plots of which being shown below:





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We can then observe that as N increases, both the magnitude and phase of the signal become clearer. It is seemingly important to notice that they all describe the same signal, however, only differing in resolution.