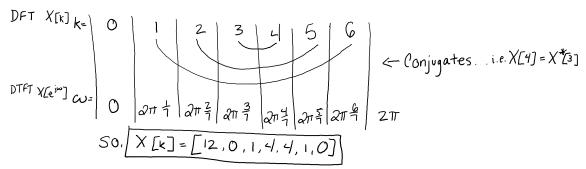
1. Let x[n] be a finite length signal, N = 7

(i.e. x[n] = 0 for n < 0 and $n \ge 7$)

Given the first 4 samples of rts DFT X[k] = 12, 0, 1, 4 for k = 0, 1, 2, and 3 respectively

a) Find X[k] for k = 4, 5, 6



- b) What kind of symmetry does x[n] have? Since X[k] is real, x[n] must be periodic Symmetric
- 2. Given signal x[n] sampled at 5 Hz, you take 5 consecutive readings and call that data $x_1[n]$ (i.e., $x_1[n]$ is zero outside the interval $0 \le n < 5$)

You take its DFT and call it $X_1[k]$, What index k corresponds to signal energy at:

DFT
$$\times [k]$$
 $K = 0$ | $2\pi \frac{1}{5}$ $2\pi \frac{3}{5}$ $2\pi \frac{4}{5}$ rads/sample $f = \omega \cdot f_s/2\pi = 0$ | $2\pi \frac{1}{5}$ $2\pi \frac{3}{5}$ $2\pi \frac{3}{5}$ $2\pi \frac{4}{5}$ rads/sample otherwise aliased aliased aliased aliased analysis

- b) 1 Hz? K = \
- c) 2 Hz? k = 2
- d) 3 Hz? Can't be done; 3 Hz >fs/2