EE5175
Lab 14 : Super-Resolution

Let $x(t) = \sin(2\pi f_o t) + \sin(2\pi f_1 t)$, where $f_0 = 4$Hz, $\triangle f = 0.3$Hz and $f_1 = f_0 + \triangle f$. Obtain $x[n] = x(nT_s)$ containing N samples, such that: $\frac{1}{NT_s} < \triangle f$ and $T_s = 0.1$ sec.

Generate the following two sequences:

$$y_1 = DW_1 x$$

$$y_2 = DW_2 x$$

where, W_1 is an identity matrix, W_2 is the matrix causing the shift ($\triangle x = 0.3$) and D performs downsampling by 2. Now, check whether we can get back the unaliased signal $x[n]$ from the signals y_1 and y_2.