Ex. 1
Prove: Suppose C is a linear $[n, k]$-code having generator matrix G. Then a vector $\vec{v} \in V(n, q)$ belongs to $C^{\perp} \Leftrightarrow \vec{v}G^{\top} = 0$, where $G^{\top}$ denotes the transpose of G.

Ex. 2
Determine the dual codes $C_1^{\perp}$ and $C_2^{\perp}$ for $C_1 = \{000, 111\}$ and $C_2 = \{00000, 11111\}$.

Ex. 3
Prove that if E_n is the binary even weight code of length n, then $E_n^{\perp}$ is the repetition code of lengt n. Give the generator matrices and the parity check matrices for the two codes.

Ex. 4
Let C be the ternary linear code with generator matrix

$$\begin{bmatrix} 1 & 1 & 1 & 0 \\ 2 & 0 & 1 & 1 \end{bmatrix}.$$

a) Find a generator matrix G for C in standard form
b) Find a parity check matrix H for C in standard form.