EE5160: Error Control Coding
Problem Set 3

1. Consider a binary linear block code with the following matrix as a generator matrix:

$$G = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 \end{bmatrix}$$

    a. Put the given generator matrix into systematic form and find all the codewords.
    b. Find the parity-check matrix of the code in systematic form. Determine the parity-check equations.
    c. What is the minimum distance of the code?
    d. Determine the weight distribution of the code.