ECS 452 Additional Examples for Section 5.1

1. Suppose the generator matrix of a linear code is given by

$$\mathbf{G} = \begin{pmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{pmatrix}$$

   a. Find the codeword for the message **b** = [1 0 0]

   b. Find the codeword for the message **b** = [0 1 1]

2. Suppose the generator matrix of a linear code is given by

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

   a. Find the codeword for the message **b** = [1 0 0 0]

   b. Find the codeword for the message **b** = [0 1 1 0]

3. Suppose the generator matrix of a linear code is given by

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

   Find the complete codebook of this code.