ECE 575 HW #2

① Generator matrix of a linear code is given as

$$G = \begin{bmatrix} 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 \end{bmatrix}_{k \times n}$$

a) $k = ?$ $n = ?$

b) Find all the codewords

b) Find parity check matrix H of your code

c) Find all the dual codewords

d) Generate all the n-tuples of the vector space and show the code and its dual in the vector space. Indicate that they are sub-spaces of the vector space

e) What is the dimension of your code

f) " " " " " " dual code

g) Minimum distance of the code?

h) Hamming weight of all the codewords

i) How many errors can be corrected for sure?

j) How many errors can be detected for sure?

k) Can more errors be detected than in part (j). If yes explain? (i.e, not always but sometimes)

l) Is this code a maximum distance separable code?