

ECS 452: In-Class Exercise # 10

Instructions

1. Separate into groups of no more than three persons.
2. The group cannot be the same as your former group.
3. Only one submission is needed for each group.
4. **Write down all the steps** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.
5. **Do not panic.**

Date: 3 0 / 0 3 / 2017			
Name			ID <small>(last 3 digits)</small>
Prapun			5 5 5

Consider a block code whose generator matrix is

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

1. Find the code length n

The #columns of G is 6

2. Find the length k of each message block

The #rows of G is 3

3. In the table below, list all possible data (message) vectors \mathbf{b} in the leftmost column (one in each row). Then, find the corresponding codewords \mathbf{x} and their weights in the second and third columns, respectively.

\mathbf{b}	\mathbf{x}	$w(\mathbf{x})$
000	000000	0
001	001110	3
010	010011	3
011	011101	4
100	100101	3
101	101011	4
110	110110	4
111	111000	3

min.

4. Find the minimum distance d_{\min} for this code.

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