

MAT 148, Winter 2016

Homework Assignment 2

Due before the start of the class on Wednesday, January 20

Please read the sections 1.1-1.3 of the textbook before starting on the problem set.

Written Assignment (see p. 14-15):

12. Give generator and parity check matrices for the binary code consisting of all even weight vectors of length 8.

14. Give a parity check matrix for the $[7,4]$ Hamming code with the generator matrix:

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

16. Show that in a binary code either all the vectors have even weight or half have even weight and half have odd weight.

23. Is it possible to find 8 binary vectors of length 6 so that $d(u, v) \geq 3$ for any two of them? If so, can the eight vectors form a linear code?

The homework must be legible, and written in connected sentences that explains what you are doing. Just the answer (whether correct or not) is not enough. Please put your name and section number on every page and staple the pages together. Homework should be handed in on time, late homework will not be graded.