CMSC 442/653
Spring 2009
Instructor: Dr. Lomonaco
Homework 5

- Listen to Vivaldi's Le Quattro Stagioni (The Four Seasons)
- **Reading Assignment:** Review relevant slides on "Overview of Coding Theory" found at http://www.cs.umbc.edu/~lomonaco/f06/653/Slides653.html
- **Optional Reading assignment:** Peterson & Weldon, "Error-Correcting Codes," MIT Press, (Second Edition), Chapter 3, Section 4, pages 52-56.

Problem.

Let V be a binary linear code given by the generator matrix

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

a) Find a parity check matrix H of V.

b) Construct a maximum likelihood decoding table for V.

c) Use H to reduce the maximum likelihood decoding table of b) to an error/syndrome table.

d) Demonstrate how your error/syndrome table can be used to decode the received vector $r = 111101$.

e) Use the generator matrix to create a list of all code vectors of V Then use this list to determine the minimum distance of V.