16.36: Comm. Sys. Engineering   Date Issued: April 8 2003
Problem Set No.7   Date Due: April 15, 2003

Problem 1:

Find the capacity for the channel shown in figure 1. This channel is known as a binary erasure channel, where with probability ε, a transmitted bit is "erased" and the received cannot determine if it was a zero or a one.
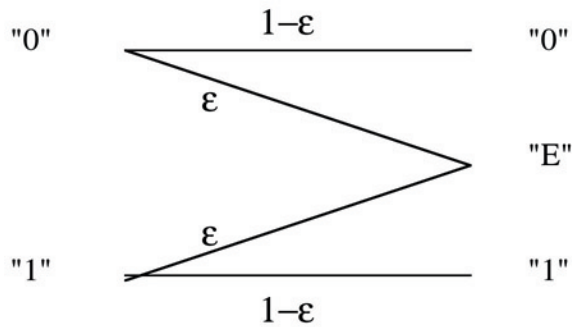
Problem 2:

Generate the standard array for the following (6,3) code (in systematic form): {000000, 100101, 001011, 101110, 010111, 110010, 011100, 111001}. How would you decode the received sequence 111111?

Problem 3:

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

The generator matrix for a (6,3) code is given above.
A) find the minimum distance for the code
B) Find the parity check matrix for the code
C) What codeword would you use to encode 111?
D) Suppose you receive 111111, how would you decode it?