CS3413

Data Communications

Fall 2009 - Assignment 5

Due Date: Friday, Oct 30, 2009, 5pm

!!!! NO LATE HW WILL BE ACCEPTED !!!!

50 points

Write a program (in any programming language) to understand and demonstrate how error correcting works under different BER values. Specifically, use the (n,k) block coding, with n=5 and k=2 as we discussed in class (this example is in the textbook, too. See page 198).

You program will have three major parts (functions) and you will call these functions back-to-back in your main program:

Sender: asks user to enter BER and a message (i.e., a stream of characters), for example

> **>Enter BER (or Pb):** 0.0001
>
> **>Enter your message:** this is my hw

This function encodes that message using (n,k) block coding and creates a frame (say sent_frame). Basically, you will deal with the bit representation of the message and replace every two bits with the corresponding 5-bit codeword.

Transmitter: takes sent_frame as a parameter and creates another same size frame called received_frame by flipping every bit in the sent_frame with the given probability Pb or BER. Then this function prints out the sent_frame and received_frame on the screen.

Receiver: takes received_frame as aparameter and tries to correct/detect errors so that it can figure out what was the original message sent… this function should print out which errors are corrected or just detected but cannot be corrected. At the end, by comparing the original message and the received message, determine wrongly corrected parts of the message if any.

What to return (Submission will be done using WebCT):
Run your program for several cases with different BER (or Pb).Specifically try 10^-6, 10^-5, 10^-4, 10^-3, 10^-2, and comment on how the increase in BER affects the performance of (n=5,k=2) block coding.

Using WebCT, submit your source code and the output file with your comments on the performance of (n,k) block coding as BER increases.