20661 Data Communications
Homework #2
Due on November 6 (Wed)

Fall 2019

Please keep in mind the following policy:

- o Submit your work at the course webpage by 23:59 on the due date.
- o When your work is not turned in on time, a late penalty will be given. Notice that it is 10% a day within a week, and thereafter, your score is 0.
- o You may discuss problems with your friends, but all work must be done individually and you must be able to prove that you understand everything that you hand in. Any copied work will be given 0, for both the copied work and the work it was copied from.

1. Exercises (problem solving)

None

2. Programming assignment

Your work is to write your own program of the AMI line coding used with HDB3 scrambling technique in C language, which converts a sequence of digital data to a sequence of digital signals (for Tx) and vice versa (for Rx). Refer to Chapter 4 of your textbook for the AMI line coding used with HDB3 scrambling technique. (Tx: Transmitter, Rx: Receiver)

You should run 10 or more different inputs for both directions of conversion. The followings are examples of test inputs and outputs. (Note here that the two prefixes 'D' and 'S' represent Data and Signal, respectively.)

Input => Output

D 0 0 1 0 0 0 0 0 0 0 0 1 1 … => **S** 0 0 + 0 0 0 + - 0 0 - + - … // Tx

D 1 1 0 0 0 0 1 0 0 0 0 0 1 … => **S** + - + 0 0 + - 0 0 0 - 0 + … // Tx

……

S 0 0 + 0 0 0 + - 0 0 - + - … => **D** 0 0 1 0 0 0 0 0 0 0 0 1 1 … // Rx

S + - + 0 0 + - 0 0 0 - 0 + … => **D** 1 1 0 0 0 0 1 0 0 0 0 0 1 … // Rx

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The below-mentioned TWO files should be turned in at the course webpage. (40 points of score)

1) Complete source code of your program (*.c)
2) Technical report (*.doc, *.hwp, or *.pdf) including the followings:
   a) Compile message of your program (screen capture)
   b) Input and output of your running test (screen capture)
   c) Brief description on what you have learned

3. Essay and/or reading assignment

None