COE 342 - Data & Computer Communications
Fall 2002 (Term 021)

Programming Assignment # 2

Due Date: Saturday December 21st, 2002

Q.1. Write a program to implement an encoder that receives binary data and produces the encoded data in a digital signal using each of the following digital encoding techniques:

- **Nonreturn to Zero-Level (NRZ-L)**
- **Nonreturn to Zero Inverted (NRZI)**
- **Bipolar-AMI (Alternate Mark Inversion)**
- **Pseudoternary**
- **Manchester**
- **Differential Manchester**
- **B8ZS**
- **HDB3**

Assume that the reference value is negative for all the encoding techniques (same as in Figure 5.2).

You can produce the encoded signals using text format (ascii) by using the + sign to indicate a positive signal, - sign to indicate a negative signal, and 0 to indicate 0 level. However, producing the encoded signals in a waveform style is a plus and will be given a bonus.
The binary data can be entered interactively or read from a file.

Send the **source code** (including *thorough* comments) and the **executable program** by email to: akhayyat@ccse.kfupm.edu.sa and ashraf@ccse.kfupm.edu.sa by the due date. Also, include a **Readme** file on how to run the program and the expected input. Compress all the files to be submitted in a file named **coe342_prog2_<yourID>.zip** that you send by email. The subject in the email should be "**coe342_prog2**".

Q.2. Test the correctness of your program by generating the output for the following binary data: 01001100011110000000010000010. Include in your email a copy of the encoded signals based on this input (include it in the zip file).

Late Submission:
The due date for submission is **Saturday, December 21st, 2002 at midnight**. Programs submitted after the due date will have 10% of the assignment maximum grade subtracted for every late day. If the submission is one week late, the grade for the assignment will be 0. (e.g. If you get a grade of 80% in the assignment and it was submitted 2 days later than the due date, you'll only receive a grade of 60%).