Homework Assignment #2 (Due in 2 weeks)

- Exercises
  - Chapter 3 questions 3, 10(4ed),15,17,16(4ed),36
    - Possible solutions 3, 10(4ed), 15, 17, 16(4ed), 36 (in ISM)
  - Chapter 4 questions 14, 21(4ed), 23(4ed), 27, 39
    - Possible solutions 14, 21(4ed), 23(4ed), 27, 39 (in ISM)
  - 10 points per question, but 5 points for 3.2 and 3.16

HW#2 (Chapter 3)

- 3.3 The following data fragment occurs in the middle of a data stream for which the byte stuffing algorithm described in the text is used: A B ESC C ESC FLAG FLAG D. What is the output after stuffing?

- 3.10 An 8-bit byte with binary value 10101111 is to be encoded using an even-parity Hamming code. What is the binary value after encoding?

- 3.15 Suppose that a message 1001 1100 1010 0011 is transmitted using Internet Checksum (4-bit word). What is the value of the checksum?

HW#2 (Chapter 3)

- 3.17 A bit stream 10011101 is transmitted using the standard CRC method described in the text. The generator polynomial is $x^3 + 1$. Show the actual bit string transmitted. Suppose that the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end. Give an example of bit errors in the bit string transmitted that will not be detected by the receiver.

- 3.16 Data link protocols almost always put the CRC in a trailer rather than in a header. Why?

- 3.36 Give at least one reason why PPP uses byte stuffing instead of bit stuffing to prevent accidental flag bytes within the payload from causing confusion.

HW#2 (Chapter 4)

- 4.14 Sketch the Manchester encoding on a classic Ethernet for the bit stream 0001110101.
- 4.21 Consider building a CSMA/CD network running at 1 Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size?
- 4.23 Ethernet frames must be at least 64 bytes long to ensure that the transmitter is still going in the event of a collision at the far end of the cable. Fast Ethernet has the same 64-byte minimum frame size but can get the bits out ten times faster. How is it possible to maintain the same minimum frame size?

HW#2 (Chapter 4)

- 4.27 Give two reasons why networks might use an error-correcting code instead of error detection and retransmission.
- 4.39 Store-and-forward switches have an advantage over cut-through switches with respect to damaged frames. Explain what it is.