CSCI4211 – Spring 2016  
Assignment #3  
Due Date: April 13th

1. One popular way to detect bit errors for a short string of bits is to use a parity bit. What is an even parity scheme? Assuming we transmit data in a 8x8 blocks, in order to detect bit errors we add an even parity bit at the end of each row and each column. Therefore, we really transmit a 9x9 data block instead. What kind of error detection capability does this scheme has?

2. Suppose CRC is used to detect errors. Assume the generator function used for computing is 10111. Suppose the message is 110011011100101. What will be the bit sequence that gets transmitted? Show your calculation.

3. A CDMA receiver get the following chips: (+1 -1 +3 -1 +1 +3 -1 -1). Assuming the chip sequence defined as follows:

   - A: (-1 1 -1 -1 -1 1 1 -1)
   - B: (-1 1 1 1 1 1 -1 -1)
   - C: (-1 -1 1 -1 1 1 1 -1)
   - D: (-1 -1 1 1 1 -1 1 1)

Which stations are transmitting and what bit was sent by each transmitting station?

4. What is 1-persistent CSMA? Under what condition in terms of traffic load, 1-persistent CSMA will outperform non-persistent CSMA? Why?

5. CSMA/CD: Suppose a CSMA/CD network is running at 100Mbps over a 1000m cable with no repeaters. The signal speed in the cable is 200,000 km/sec. Compute the following parameters:
   a. End-to-end propagation delay.
   b. Worst-case collision detection time
   c. Minimum frame size