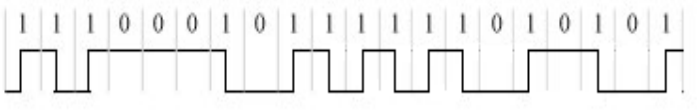
CS4850/7850 HW2 solution

1.

11100 01011 11110 10101



2. The stuffed bits (zeros) are in bold:

1101 0111 11**0**0 1011 111**0** 1010 1111 1**0**11 0

3.

(a) We take the message 11100011, append 000 to it, and divide by 1001. The remainder is 100; what we transmit is the original message with this remainder appended, or 1110 0011 100.

```
11100011000
1001
 1110
 1001
  1110
  1001
   1111
   1001
    1101
    1001
     1000
     1001
      0010
      0000
       0100
       0000
        100
```

(b) Inverting the first bit of the transmission gives 0110 0011 100; dividing by 1001 gives a remainder of 010; the fact that the remainder is nonzero tells us a bit error occurred.

```
01100011100
0000
 1100
 1001
  1010
  1001
   0111
   0000
    1111
    1001
     1101
     1001
      1000
      1001
       0010
       0000
        010
```

4.

RTT = 2.5 s

Pipe capacity = bandwidth * RTT / packet size = 306 packets (Window Size)

MaxSequenceNumber = 2*306 = 612. So 10 bits are needed.

5.