ELEX 3525 : Data Communications
2014 Fall Session

Assignment 1

Due Wednesday, September 24. Show your work. Submit your assignment using the appropriate dropbox on the course web site. Assignments submitted after the solutions are made available will be given a mark of zero.

Question 1

Consider the rightmost four characters of your BCIT ID as a decimal number. Convert this number to:

- a 16-bit binary number (in network order)
- a hexadecimal number (in network order)
- write the numbers above with the two bytes in little-endian order and the bits within each byte also in little-endian order.

Question 2

Find the Unicode code point (the index in the Unicode code table) for the following character: "ARABIC LETTER ALEF" (Hint: `http://unicode.org` -> *The Unicode Standard* -> *Code Charts* -> *Arabic*).

Question 3

The Chinese character for "Monkey" (the animal) is "猴" with Unicode value (code point) U+7334.

- how many octets does it take to represent this character using the UTF-8 encoding?
- what are the values of these octets in hexadecimal?

Question 4

You receive a document that you've been told contains UTF-8 encoded text but that some bytes may have been dropped from the beginning of the document. The first bytes in the document are 0x95 0x94 0xD3 0x82 081. How many character(s) can you decode from this initial portion of the document? What are their/its Unicode code point(s)? Explain your answer.

Question 5

Consider the waveform you created in Lab 1. Assume a sequence of these waveforms (including the one start and four stop bits) are transmitted continously with random[1] data bit values.

What are the data rate, bit rate, information rate, baud rate and throughput?

[1] Truly random data cannot be compressed.