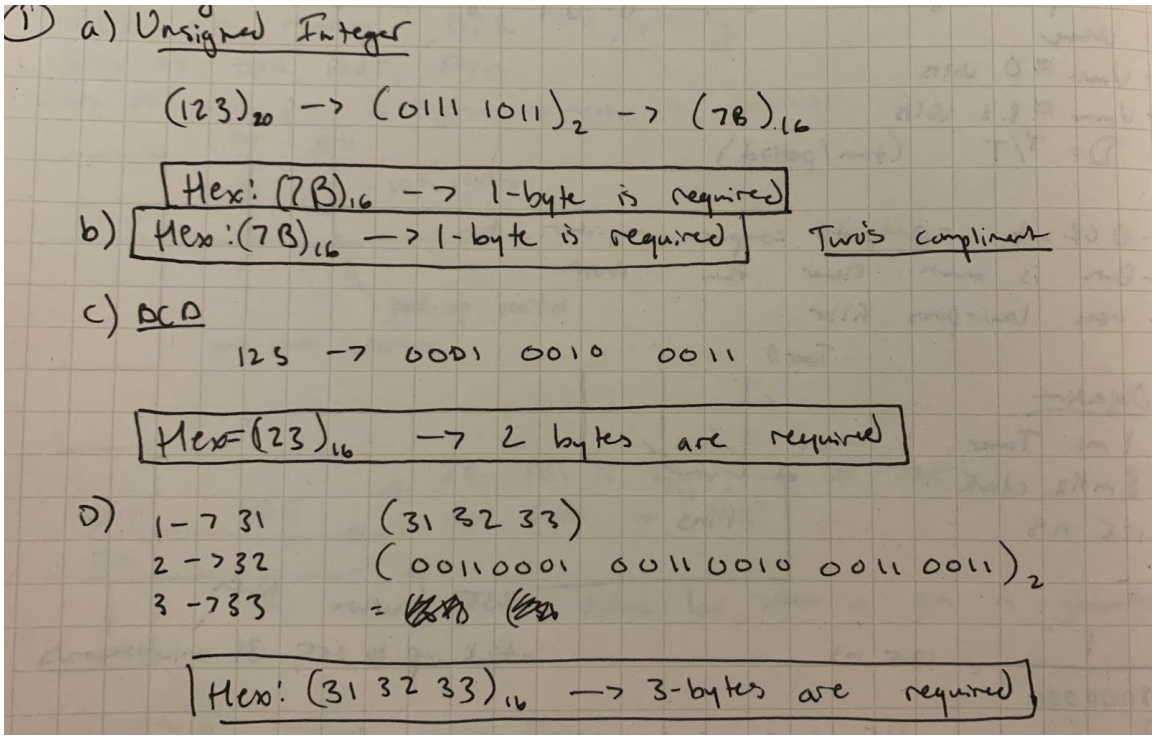
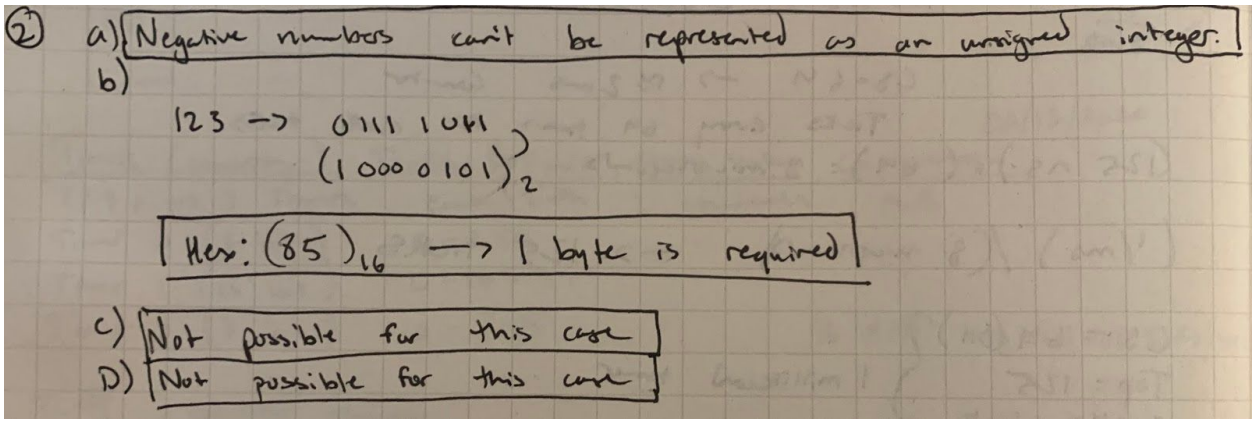
Kiersten Page
EE4144 - Intro to Embedded Design
Homework 1

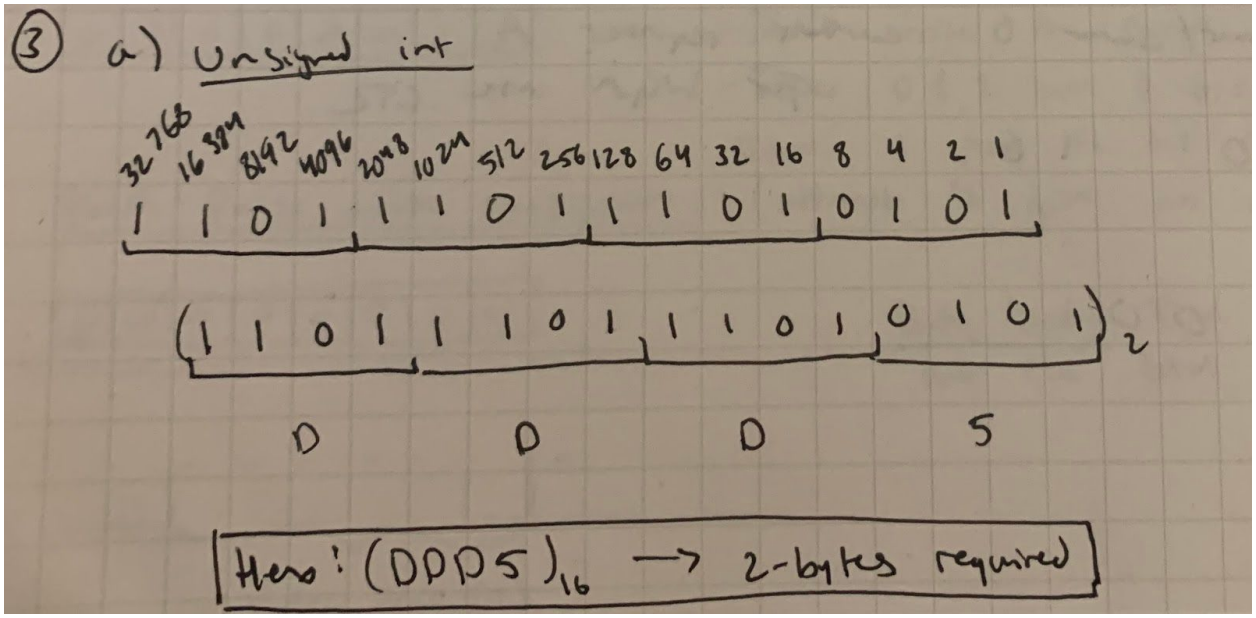
1) .

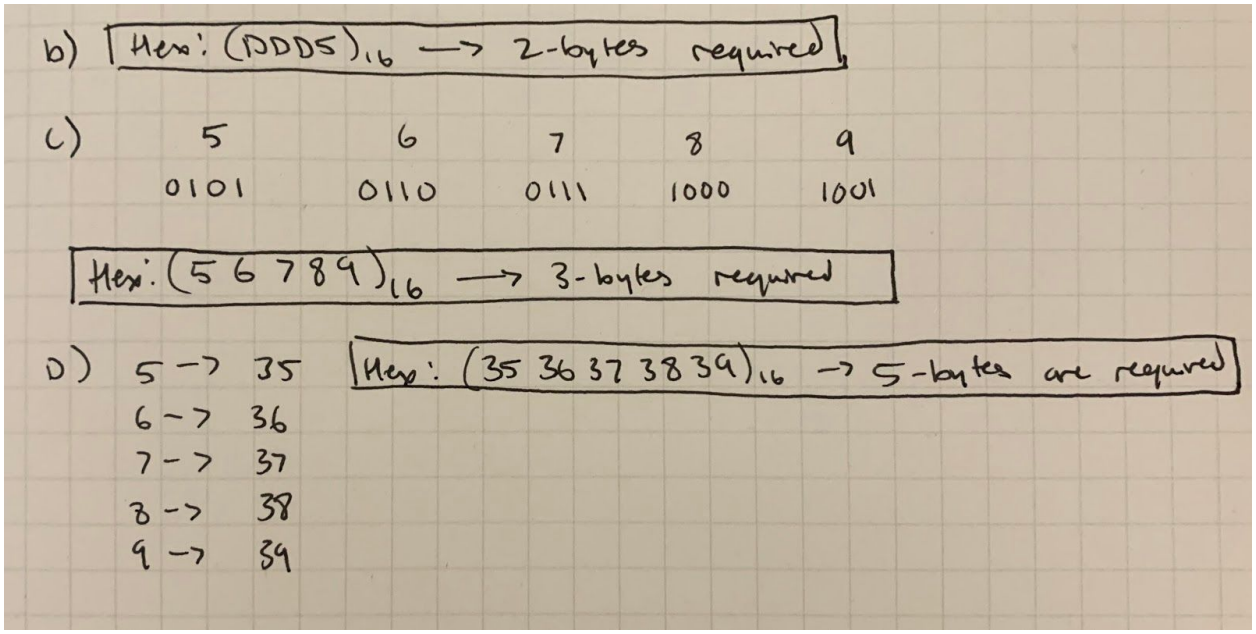


2) .



3)

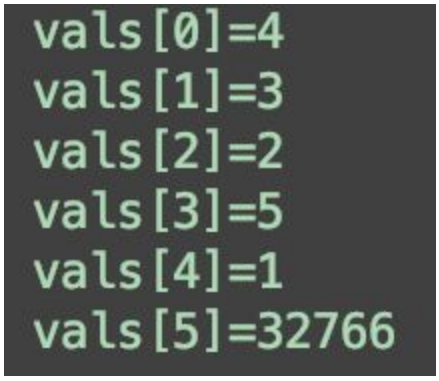

3) a) Unsigned int
32768 16384 8192 4096 2048 1024 512 256 128 64 32 16 8 4 2 1
1 1 0 1 1 1 0 1 1 1 0 1 0 1 0 1
(1 1 0 1 1 1 0 1 1 1 0 1 0 1 0 1)2
D D D 5
Hex: (DDD5)16 → 2-bytes required


b) Hex: (DDD5)16 → 2-bytes required
c) 5 6 7 8 9
0101 0110 0111 1000 1001
Hex: (5 6 7 8 9)16 → 3-bytes required
d) 5 → 35
6 → 36
7 → 37
8 → 38
9 → 39
Hex: (35 36 37 38 39)16 → 5-bytes are required

4)

a) An integer is a variable type used to represent a whole number. Integers have the size of 16 bits
   i) Example: int x;
b) Pointers “point” to a memory location and the variable itself holds the address of a corresponding variable.
   i) Example: int * x_ptr = &x;
c) An array of 10 integers is a data structure that contains a group of 10 integers.
   i) Example: int x[10] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};
d) An array of 10 pointers to integers is a data structure that contains a group of 10 pointers to integers.
   i) Example: int *x[10];

5)



6) 20
7) 30
8) The purpose of the word volatile is to let the computer know that the value of the variable might change at any time without the code’s influence
9) It’s not good coding practice to dynamically allocate memory in embedded programming because it takes up a lot of memory and with embedded programming, there isn’t a lot of memory available