CS-2810-002 Assignment #2

Russell Andlauer

(answers in Bold)

2.1) Given n bits, there are 2ⁿ bits of distinct combinations.

2.2) In order to represent each character of the alphabet you would need at least 5 bits. To be able to assign a unique bit patter for both uppercase and lowercase letters, you would need at least 6 bits.

2.6) -32 = **100000**

2.7) **0000 = 0 1111 = -1**

**0001 = 1 1110 = -2**

**0010 = 2 1101 = -3**

**0011 = 3 1100 = -4**

**0100 = 4 1011 = -5**

**0101 = 5 1010 = -6**

**0110 = 6 1010 = -6**

**0111 = 7 1001 = -7**

**1000 = -8**

2.10) a.) 1010 --> 0110 = 6 --> **-6**

b.) 01011010 🡪 = **90**

c.) 11111110 🡪 00000010 = 2 🡪 **-2**

**`** d.) 0011100111010011 = **14,803**

2.11) a.) 102 =**1100110**

b.) 64 = **01000000**

c.) 33 = **00100001**

d.) -128 = **10000000**

e.) 127 = **01111111**

2.13) a.) 1010 = **11110110**

b.) 011001 = **00011001**

c.) 1111111000 = **10001000**

d.) 01 = **00000001**

2.14) a.) 1011 + 0001 = **1100**

b.) 0000 + 1010 = **1010**

c.) 1100 + 0011 = **1111**

d.) 0101 + 0110 = **1011**

e.) 1111 + 0001 = **overflow, unable to do calculation with only 4 bits**