Ben Walker
CSC 242-02
Chapter 2 Homework Questions

Chapter 2 – Homework

- Review of Essential Terms and Concepts (pg.116)

1) Binary Digit

4) Base 2, 8 and 16 are related through the number of bits that are used to calculate each. Base 2 uses each individual bit, base 8 uses every 3 bits, and base 16 uses every 4 bits. In this way, the maximum number before roll over, is one less than the number of the base, and is all those bits set as 1. Ex, Binary: 1 `0001`, Octal 7 `0111`, Hexadecimal 15 `1111`.

7) When a number cannot be represented in the alloted amount of bits, this constitutes an overflow.

9) Two's Compliment.

16) A carry is when a bit value needs to be carried to the next position, whereas an overflow is when a bit value needs to go beyond the alotted number if bits. Carry out of the leftmost bit in unsigned operations indicates overflow. They each work independently of the other and it seems that overflow flag is set with signed numbers.

24) ASCII is the American Standardized Code for Information Interchange. It made use of parity and this aided the gravitation towards its use. It makes use of one byte, with the eighth bit being the parity bit, which aids in error detection.

- Exercises (pg. 117)

1a) 458 / 3 = 152 / 3 = 50 / 3 = 16 / 3 = 5 / 3 = 1 / 3 = 0   =   00121222
     2   2   2   1   2   1   0

2a) 588 / 3 = 196 / 3 = 65 / 3 = 21 / 3 = 7 / 3 = 2 / 3 = 0   =   00210210
     0   1   2   0   1   2   0

7b) 194 / 2 = 97 / 2 = 48 / 2 = 24 / 2 = 12 / 2 = 6 / 2 = 3 / 2 = 1 / 2 = 0   =   11000010
     0   1   0   0   0   0   1   1   0

   .5 / 2 = .25 / 2 = .125 / 2 = .0625 / 2 = .03125   =   .000010
     0   0   0   0   1   = 11000010.000010

11a) 32 + 1 = 33
   .5 + .25 + .125 = .875   =   33.875

16(a-d, only use 2's complement):
   a) 77 : `01001101`
   b) -42 : `11010110`
   c) 119 : `01110111`
   d) -107: `10010101`

20(a,d):
   a) 158
   d) -98

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33(a-c):

    a) `01000100 + 10111011 = 11111111`

    b) `01011011 + 00011111 = 01111010`

    c) `10101100 + 00100100 = 11010000`

37b) `10011 * 1011 = 11010001`

56a) `1100111`

58) JOHN DOE