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Number systems - Homework

1) decimal to binary

1. 72 = **01001000**

(2^6) + (2^3) = 72

1. 173 = **10101101**

(2^7) + (2^5) + (2^3) + (2^2) + (2^0) = 173

2) unsigned binary to decimal

1. 10001110 = **142**

(2^7) + (2^3) + (2^2) + (2^1) = 142

1. 01110011 = **115**

(2^6) + (2^5) + (2^4) + (2^1) + (2^0) = 115

3) signed binary to decimal

1. 10001110 = **-114**

10001110 -> 01110001 + 1 = -114

1. 01110011 = **115**

(2^6) + (2^5) + (2^4) + (2^1) + (2^0) = 115

4) binary to hex

1. 10001110 = **0x8E**

1000 = 8

1110 = E

1. 01110011 = **0x73**

0111 = 7

0011 = 3

5) decimal to hex

1. 427 = **0x1AB**

427 / 16 = 26 R 11 = B

26 / 16 = 1 R 10 = A

1 / 16 = 0 R 1 = 1

1. 841 = **0x349**

841 / 16 = 52 R 9 = 9

52 / 16 = 48 R 4 = 4

48 / 16 = 48 R 3 = 3

6) hex to decimal

1. 0x5e = **94**

5 \* 16^1 + 14 \* 16 ^0 = 94

1. 0x1C3 = **451**

1 \* 16^2 + 12 \* 16^1 + 3 \* 16^0 = 451

7) hex to binary

1. 0x1234 = **0001 0010 0011 0100**

1 - 0001

2 - 0010

3 - 0011

4 - 0100

1. 0xFBA2 = **1111 1011 1010 0010**

F - 1111

B - 1011

A - 1010

2 - 0010

8) 2’s complement of binary numbers

1. 01111110 = **10000010**

01111110 -> 10000001 + 1 = 10000010

1. 11100110 = **00011010**

11100110 -> 00011001 + 1 = 00011010

1. 10000001 = **01111111**

10000001 -> 01111110 + 1 = 01111111

1. 00000000 = **100000000**

00000000 -> 11111111 + 1 = 100000000

1. 10000000 = **10000000**

10000000 -> 01111111 + 1 = 10000000