Assignment 3 – Some Practice Problems

Base Conversion (6 points)

Convert each of the following from base 10 to base 2.

a. 169_{10} = 10101001

b. 121_{10} = 1111001

c. 189_{10} = 10111101

Unsigned Addition in Base 2 and Base 16 (12 points)

Complete each of the following, making sure to express your answer in the base that is specified for each.

a. What is $10011111_2 + 100001_2$ in base 2? 11000000

b. What is $111101100_2 + 111001_2$ in base 2? 1000100101

c. What is $1DA71A728_{16} + C8D92D_{16}$ in base 16? 1DB3A8055

d. What is $53084B279_{16} + CC7D531_{16}$ in base 16? 53D4C87AA

Bitwise Operations (14 points)

If we have

char x = C6, y = 7D;

what is the result of the following operations?

***Note**: Your answer must be in the form of exactly two hex digits (i.e. ignore the possibility of promotion to 32-bit ints and behave as though we're living in the land of 8-bit arithmetic).*

a. x << 2 03 18

b. x < 1 00

c. x - y 49

d. !!x C6

e. ~x 39

f. x & y 44

g. x ^ y ^ y BB

h. -x 3A

i. x & 0x0F 06

j. ~~x C6

k. x | | y FF

l. x | y FF

m. x ^ y BB

n. x && 1 01

Addressing and Byte Ordering (8 points)

Let's say we have

```
int x = 0x68AD1F04; /* word size = 4 bytes = 32 bits */
```

which we'll say is stored in addresses **0x100** through **0x103**.

Specify the little endian vs. big endian byte ordering below.

Note: Specify only the two hex digits (so without the preceding 0x) that make up each byte.

Little Endian:

Address	Value
0x100	04
0x101	1F
0x102	AD
0x103	68

Big Endian:

Address	Value
0x100	68
0x101	AD
0x102	1F
0x103	04