Assignment #1

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Translate the following numbers to BOTH binary AND unsigned hexadecimal

1.1 65

Binary 0100 0001

Hexadecimal 41

1.2 409

Binary 0001 1001 1001

Hexadecimal 199

1.3 16385

Binary 0100 0000 0000 0001

Hexadecimal 4001

2

What are the unsigned decimal AND hexadecimal representations of each of the following binary numbers?

2.1 0011 0101 1101 1010

Decimal 13786

Hexadecimal 35DA

2.2 1100 1110 1010 0011

Decimal 52899

Hexadecimal CEA3

2.3 1111 1110 1101 1011

Decimal 65243

Hexadecimal FEDB

3

What is the binary representation of the following hexadecimal numbers?

3.1 A4693FBC

1010 0100 0110 1001 0011 1111 1011 1100

3.2 B697C7A1

1011 0110 1001 0111 1100 0111 1010 0001

3.3 2B3D9461

0010 1011 0011 1101 1001 0100 0110 0001

4

What is the 16-bit hexadecimal representation of each of the following signed decimal integers?

4.1 -21

$\rightarrow$ 0000 0000 0001 0101
$\rightarrow$ 1111 1111 1110 1010
$\rightarrow$ 1111 1111 1110 1011
$\rightarrow$ FFEB

4.2 -45

$\rightarrow$ 0000 0000 0010 1101
$\rightarrow$ 1111 1111 1101 0010
$\rightarrow$ 1111 1111 1101 0011
$\rightarrow$ FFD3

5

The following 16-bit hexadecimal numbers represent signed integers. Convert each to decimal.

5.1 6BF9

$(6 \times 16^3) + (11 \times 16^2) + (15 \times 16^1) + (9 \times 16^0) = 27641$

5.2 C123

$\rightarrow$ 1100 0001 0010 0011 , MSB = 1 $\therefore$ negative
$\rightarrow$ 0011 1110 1101 1100
$\rightarrow$ 0011 1110 1101 1101
$\rightarrow -16093$

6

What is the 8-bit binary (two's-complement) representation of each of the following signed decimal integers?

6.1 -72

$$\begin{aligned} &\rightarrow 0100\ 1000 \\ &\rightarrow 1011\ 0111 \\ &\rightarrow 1011\ 1000 \end{aligned}$$

6.2 -98

$$\begin{aligned} &\rightarrow 0110\ 0010 \\ &\rightarrow 1001\ 1101 \\ &\rightarrow 1001\ 1110 \end{aligned}$$

6.3 -26

$$\begin{aligned} &\rightarrow 0001\ 1010 \\ &\rightarrow 1110\ 0101 \\ &\rightarrow 1110\ 0110 \end{aligned}$$

7

What is the sum of each pair of hexadecimal integers?

7.1 6B4 + 3FE

$$\begin{aligned} 4 + E &= 2,\ \text{carry } = 1 \\ B + F + 1 &= B,\ \text{carry } = 1 \\ 6 + 3 + 1 &= A \end{aligned}$$

$0\text{xAB2} \equiv 2738$

7.2 A49 + 6BD

$$\begin{aligned} 9 + D &= 6,\ \text{carry} = 1 \\ 4 + B + 1 &= 0,\ \text{carry} = 1 \\ A + 6 + 1 &= 1,\ \text{carry} = 1 \end{aligned}$$

$0\text{x}1106 \equiv 4358$