

CS120 - Computer Science I

Practice Sheet - Answers

Name _____

1. Express the following values as 8-bit 2's complement values:

a) +34 Answer: 0010 0010

b) -73 Answer: 1011 0011

c) +92 Answer: 0101 1100

d) -1 Answer: 1111 1111

2. Determine the decimal values of each of the following bit patterns if they are interpreted as unsigned, 1's complement and 2's complement values:

	Unsigned	1's Complement	2's Complement
a) 0010 1110	46	+46	+46
b) 1001 1000	152	-103	-104
c) 1111 1111	255	-0	-1

3. Perform the following 2's complement arithmetic. Verify your answer by determining the decimal values of each number in the problem:

$$\begin{array}{r}
 \text{a.) } 0001\ 1101 \quad +\ 29 \\
 +\ 0110\ 1001 \quad +105 \\
 \hline
 1000\ 1100 \quad (\text{Overflow!})
 \end{array}$$

$$\begin{array}{r}
 \text{b.) } 1011\ 0011 \quad -77 \\
 +\ 1110\ 1011 \quad -21 \\
 \hline
 1001\ 1110 \quad -98
 \end{array}$$

$$\begin{array}{r}
 \text{c.) } 0110\ 1101 \quad +109 \\
 -\ 0011\ 0011 \quad -(+51) \\
 \hline
 0011\ 1010 \quad +58
 \end{array}$$

$$\begin{array}{r}
 \text{d.) } 1011\ 1100 \quad -68 \\
 -\ 0011\ 1100 \quad -(+60) \\
 \hline
 1000\ 0000 \quad -128
 \end{array}$$