

SRJC - CS 10A: Worksheet 2

SOLUTION

Fill in the following truth tables

AND: $X \& Y = Z$ (2 points)

X	Y	Z
0	0	0
0	1	0
1	0	0
1	1	1

OR: $X | Y = Z$ (2 points)

X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	1

XOR: $X \wedge Y = Z$ (2 points)

X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	0

NOT: $\sim X = Z$ (1 point)

X	Z
0	1
1	0

Translate the following into characters.
Make note of which bases are being used.

(1 point each)

1. 0b1000010 = **B**

2. 052 = *****

3. 0x68 = **h**

For this table, **show all of your work** on how you determined the min and max values (use the back):

Var Type	Bytes	Min Value	Max Value
char	1	-128	127
unsigned char	1	0	255
short int	2	-32768	32767
unsigned int	4	0	$2^{32} - 1$
int	4	$-(2^{31})$	$2^{31} - 1$

1 point for each correctly completed box. 6 points for showing your work on the back or elsewhere.

Translate the following values into base 10 format.
Values are unsigned unless stated otherwise.

(1 point each)

4. 0b1011 = **11**

5. signed 0b11100111 = **-25**

6. signed 0b101001 = **-23**

7. 0654 = **428**

8. 0101 = **65**

9. signed 0372 = **250**

10. signed 0220 = **144**

11. 0xfeed = **65261**

12. signed 0xc0fefe = **-4129026**

13. 0xb8 = **184**

14. 0x5ac = **1452**

15. signed 0xd01 = **-767**

Work expected for the table (3 points):

Where n is the number of bits:

$$n = 8 * \text{bytes}$$

Signed values:

$$\text{min} = -(2^{n-1})$$

$$\text{max} = 2^{n-1} - 1$$

Unsigned values:

$$\text{min} = 0$$

$$\text{max} = 2^n - 1$$

Var Type	Bytes	Bits (n)	Min Value	Max Value
char	1	8	$-(2^{8-1}) = -128$	$2^{8-1} - 1 = 127$
unsigned char	1	8	0	$2^8 - 1 = 255$
short int	2	16	$-(2^{16-1}) = -32,768$	$2^{16-1} - 1 = 32,767$
unsigned int	4	32	0	$2^{32} - 1 = 4,294,967,295$
int	4	32	$-(2^{32-1}) = -2,147,483,648$	$2^{32-1} - 1 = 2,147,483,647$