

# CS 315-02 Strings 2s Comp

project02 code

project02 exam problems due wed 11:59 pm

project02 due Mon Sep 28th 11:59 pm

IG Tue Sep 26th

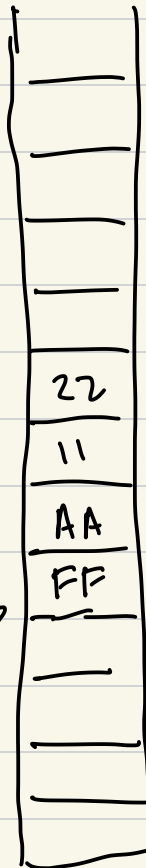
Memory

array of  
bytes

byte addressable

int x = 0x FF AA 11 22

$\&x \rightarrow$



FF

AA

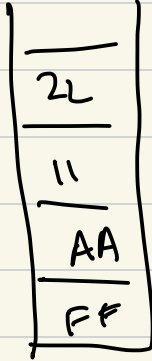
11

22

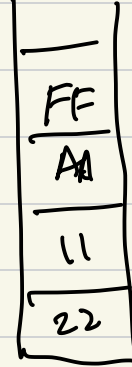
← byte

# byte ordering

int  
x = 0xFFAAT12L



Big  
Endian



Little  
Endian

# Twos Complement

3 bit numbers

Unsigned decimal	Bin	Signed Magnitude
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0	000	0 *
---	-----	-----

1	001	1
---	-----	---

2	010	2
---	-----	---

3	011	3
---	-----	---

4	100	-0 *
---	-----	------

5	101	-1 ←
---	-----	------

6	110	-2
---	-----	----

7	111	-3
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$$\begin{array}{r} 001 \quad (1) \\ + 010 \quad (2) \\ \hline 011 \quad (3) \end{array}$$

$$\begin{array}{r} \boxed{1} \overset{1}{0} \overset{1}{1} \quad (3) \\ + 101 \quad (-1) \\ \hline 000 \quad (0) \end{array}$$

# Two's Complement

3 bit

Bin	Dec
000	0
001	1
010	2
011	3
100	-4
101	-3
110	-2 ←
111	-1

Alg pos  $\rightarrow$  neg

$$x \Rightarrow -x$$

$$\text{inv}(x) + 1$$

$$\begin{array}{r} 110 \quad (-2) \\ \text{inv} \quad 001 \\ +1 \quad \quad 1 \\ \hline 010 \quad (2) \end{array}$$

$$\begin{array}{r} \text{want } -2 \quad 010 \\ \text{inv} \quad 101 \\ +1 \quad \quad 1 \\ \hline 110 \quad (-2) \end{array}$$

$$\begin{array}{r} 3 \\ + -1 \\ \hline 2 \end{array}$$

$$\begin{array}{r} \textcircled{1} 11 \\ 011 \\ + 111 \\ \hline 010 \quad (2) \end{array}$$