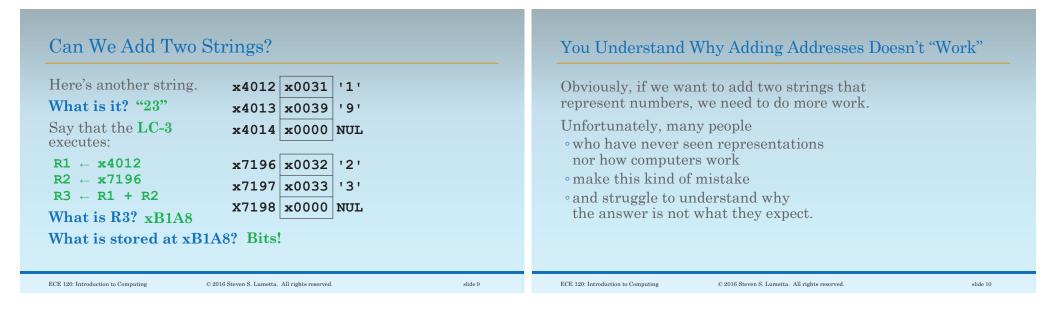


Beware of Anthropomorphism	LC-3 Includes Operations on 2's Complement Values
I may have said (and may still say) sentences like "The LC-3 only understands 2's complement."	"The LC-3 only understands 2's complement." By the definition of the LC-3 ISA , many constants and values are treated as 2's complement .
But the LC-3 is not human. The LC-3 "understands" nothing. So what am I trying to say?	Any LC-3 microarchitecture needs hardware designed to support 2's complement . For example, notice the numerous sign extension boxes in Patt and Patel's datapath.
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Other Data Types Must Be Handled in Software	Another Example: Adding Strings
 "The LC-3 only understands 2's complement." In contrast, there are no instructions (nor hardware) for directly manipulating bits in other representations. How do we use other data types with an LC-3 processor? Translate operations on other data types into sequences of instructions. In other words, write software to do it. 	Here's a software representation for a string of text (the string is "19"). The address of the first x4012 x0031 '1' ASCII character in x4013 x0039 '9' to represent the string. To "read" the string, • look at consecutive memory locations • until we find a 0 (an ASCII NUL character), • which indicates the end of the string.

slide 7



I almost forgot! I need to ask your help again!

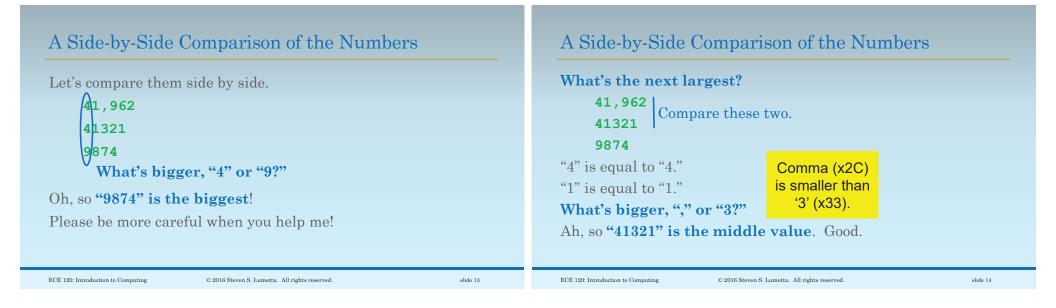
Can you help me sort these numbers?

"41,962" "41321" "9874" biggest middle smallest

Are You Sure About Your Answers?

Hmm. Are you sure? I just ask because, well ... I asked my computer, too. And **it gave different answers**:

"41,962" "41321" "9874" humans biggest middle smallest computers smallest middle biggest



So the Computer is Right?	Remember: Computers are Dumb
It seems that the computer is right.	
At least, for some definition of "right."	Think it's just a silly example?
This type of answer is what you get if you sort strings in ASCII order (instead of alphabetical order).	Take a look at the index of Patt and Patel.
"41,962" "41321" "9874" humans biggest middle smallest computers smallest middle biggest	Computers do exactly what they are told.
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