Lecture 5

or “How am I still employed?”
Homework is due next Thursday, Feb 5th
I uploaded the corrected slides with the homework earlier today
Midterm on Thursday, Feb 26
Other Load Instructions

- **lb** - Load Byte
  - lb $t0, 3($t1)
    - $t0 = MEM($t1 + 3)
- **lbu** - Load Byte Unsigned
  - lbu $t0, 3($t1)
- We have to do sign extension for lb, but not for lbu (since it is unsigned)
Example

$t0$ contains 0xaabbccdd

lb $t1$, 2($t0)$

  what is $t1$?

lbu $t1$, 2($t0)$

  what is $t1$?
Answer

0xaabbcddd

Big Endian:

MEM[0] = 0xaa
MEM[1] = 0xbb
MEM[2] = 0xcc
MEM[3] = 0xdd
Answer cont.

lb $t1, 2($t0)
  MEM[2] = 0xcc = 1100 1100
  $t1 = 0xffffffffcc
lbu $t1, 2($t0)
  $t1 = 0x00000000cc
How about this?

$t0$ contains 0x0000af00

`lb $t1, 2($t0)`

What is $t1$?

`lbu $t1, 2($t0)`

What is $t1$?
More!

- \texttt{lh} - load half word
- \texttt{ihu} - load half word unsigned
More store instructions!

- **sb** - store byte
  - Least significant byte will be stored in specified location
- **sh** - store half word
  - Least significant half word will be stored
Example

sb $t0, 2($t1)
sh $t0, 2($t1)
$t0 = 0x12345678

What will be stored using these?
Example cont

sb will store: 0x78
sh will store: 0x5678
Logical operations

AND: and, andi
OR: or, ori
NOT: nor
Shift left logical: sll
Shift right logical: srl
Next time

We will talk about branch instructions and I will take questions about the homework