16.482 / 16.561: Computer Architecture and Design
Spring 2015

Lecture 1: Key Questions
January 22, 2015

1. What information is required to translate a high-level statement such as `X[i]=i*2;` to assembly language?

2. Describe how a processor executes a typical instruction.

3. Describe the different locations in which operands can be stored and how they are accessed.

4. Describe the MIPS data transfer instructions.

5. Describe what it means for data to be aligned.

6. Compare and contrast big-endian and little-endian data.

7. Say memory holds the word 0xABCD1234, starting at address 0x1000, $t0 holds the value 0x1000, and $s0 holds 0xDEADBEEF. What are the results of the following instructions?

- lh $t1, 2($t0)

- lb $t2, 1($t0)

- lbu $t3, 0($t0)

- sh $s0, 0($t0)

- sb $s0, 3($t0)

8. Describe the MIPS arithmetic and logical instructions.

9. Say $t0 = 0x00000001, $t1 = 0x00000004, $t2 = 0xFFFFFFFF. What are the results of the following instructions?

•   sub $t3, $t1, $t0

•   addi $t4, $t1, 0xFFFF

•   andi $t5, $t2, 0xFFFF

•   sll $t6, $t0, 5

•   slt $t7, $t0, $t1

•   lui $t8, 0x1234

10. Describe the different classes of MIPS branch instructions.

11. Explain the use of pseudoinstructions in MIPS assembly.

12. Describe the different jump instructions in MIPS.