

CS/COE0447

Computer Organization & Assembly Language

Chapter 2 Part 2

Topics

- **More types of instructions**
 - Translation into machine code
 - How they work (execution)
 - Understanding the technical documentation (green card)
- **Immediate values**
 - Sign and Zero extension of immediates
 - Loading large immediate values into registers, which leads us to pseudo instructions ([source](#) versus [basic](#) in MARS)
- **Addressing: bytes, half-words, words, and alignment** *Ask any remaining questions from Lab 2*
- **Algorithms in assembly language: arrays, loops, if-statements (presented through example code).** *Ask remaining questions from Lab 3*
- **Assembly and execution of branch and jump instructions**

Example: LUI, ANDI and ORI

```
lui $t1, 0x7F40 # load 0x7F400000 into $t1
#lui is load upper immediate
#upper: upper 2 bytes (4 hex digits; 16 bits)
#immediate: part of the instruction
addi $t2, $t1, 0x777
andi $t3, $t2, 0x5555 # bitwise and
ori $t4, $t2, 0x5555  # bitwise or
```

Trace in lecture