

❖ As you wait for class to start, answer the following question:

❖ What is important in a computer? What features do you look for when buying one?

Clock speed (GHz)

OS

Storage — Persistent storage (TB)
 — Memory (GB)
 cache

Price

GPU

Display

of CPUs/Cores

Power / battery life

Type of CPU Intel, ARM

ECE/CSE 469: Computer Design and Organization

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Office hours: up-to-date times on website

Book:

Patterson, Hennessy, *Computer Organization and Design: The Hardware/Software Interface – ARM Edition*, 2017, Morgan Kaufmann.

Grading (approximate):

20% - Homeworks 30% - Design Project 20% - Midterm 30% - Final Exam

~ weekly

Nov 5th

Dec 8 8:30

Prerequisites

Basic Logic Design and Boolean Algebra

AND, OR, NAND, NOR gates

Boolean Algebra

D flip-flops, registers, and memories

Binary numbers, 2's complement, negation, overflows

Verilog

C/C++/Java programming

If you don't know this material, **DO NOT TAKE THE CLASS**

If you don't remember this material, **REVIEW NOW.**

Joint Work Policy

The processor design and homeworks will be done in groups of 1-2.

Groups may not collaborate on the specifics of homework or on the projects.

All submitted student work must be from their own efforts, and not from any other source.

Can use Piazza to form groups.

OK:

- Studying together for exams

- Discussing lectures or readings

- Talking about general approaches

- Help in debugging, CAD tools peculiarities, etc.

Not OK:

- Developing a design between groups

- Implementing the CPU between groups

- Checking homework answers between groups

Violation of these rules is at minimum:

- Loss of twice the points of that assignment.

- Report of Academic Misconduct to Dean's Level.

- Potentially fail class, be expelled from UW.

Late Policy, Lab Policy

All homework assignments due by the end of the class period

Late penalties (homework and lab):

- 10% for the first 24 hours
- 20% for the second 24 hours (total -30%)
- 30% for the third 24 hours (total -60%)
- 40% for all additional hours (total -100%)

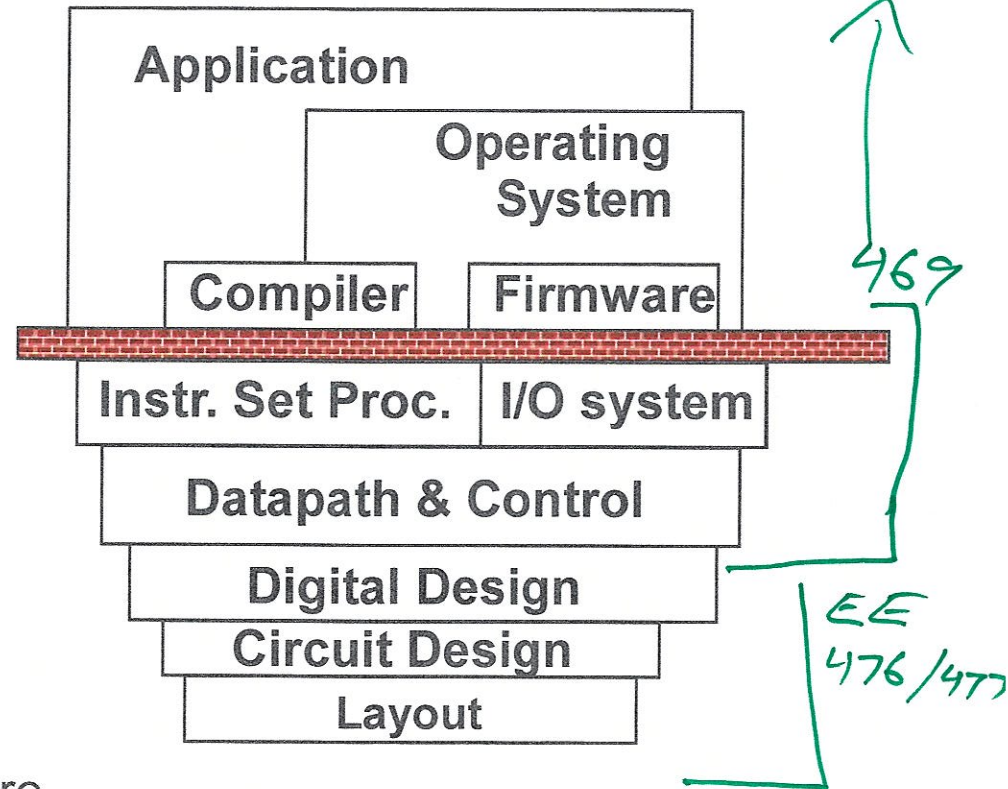
Labs are an integral portion of the class learning. Failure to make a good-faith effort at the labs is grounds for failing the class.

Computer Architecture

CS

Readings: 1.1-1.4

Instruction Set
Architecture



Interaction between hardware and software

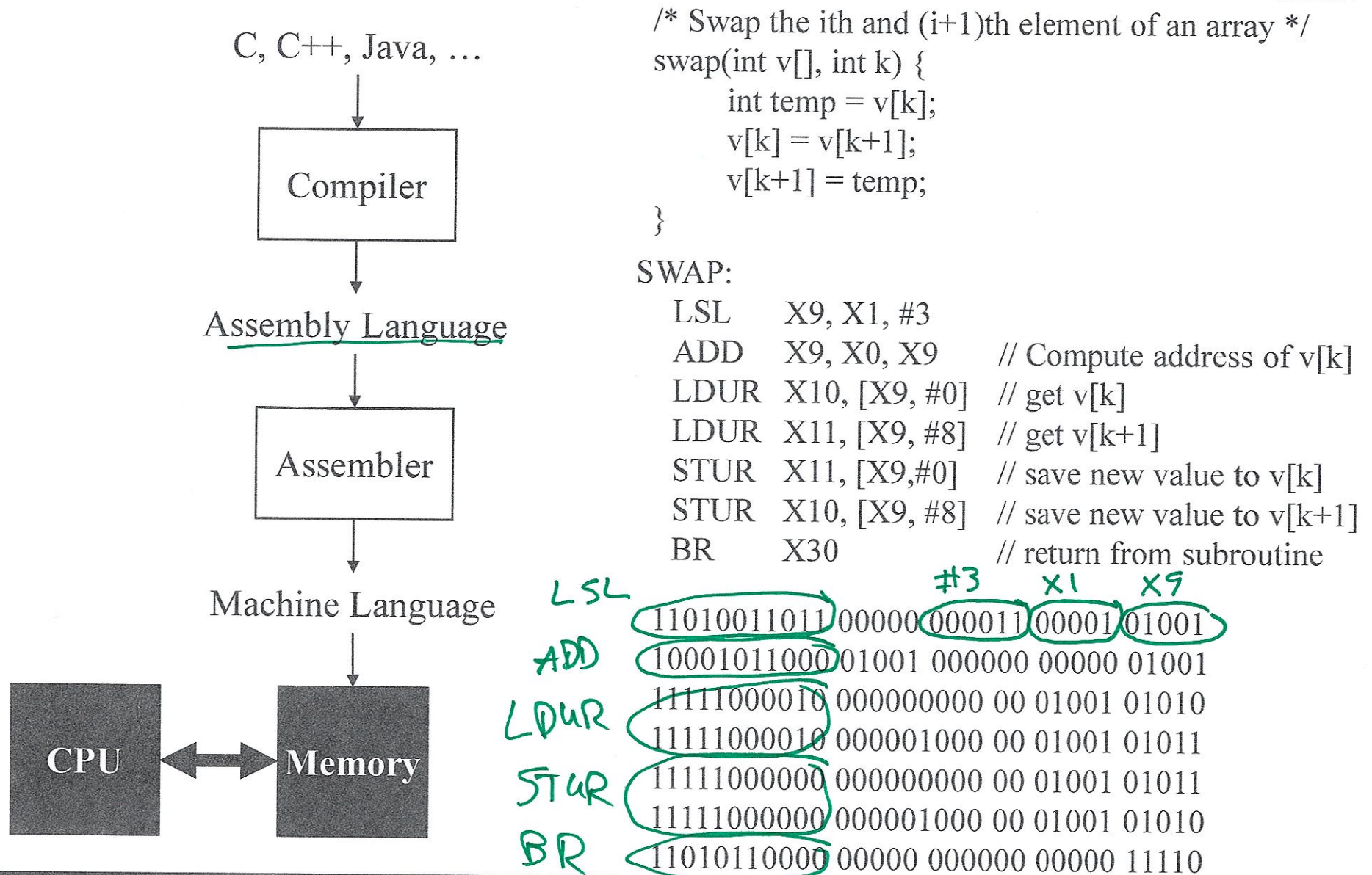
Hardware sets realities, requirements

Area, power, performance

Software places demands on hardware

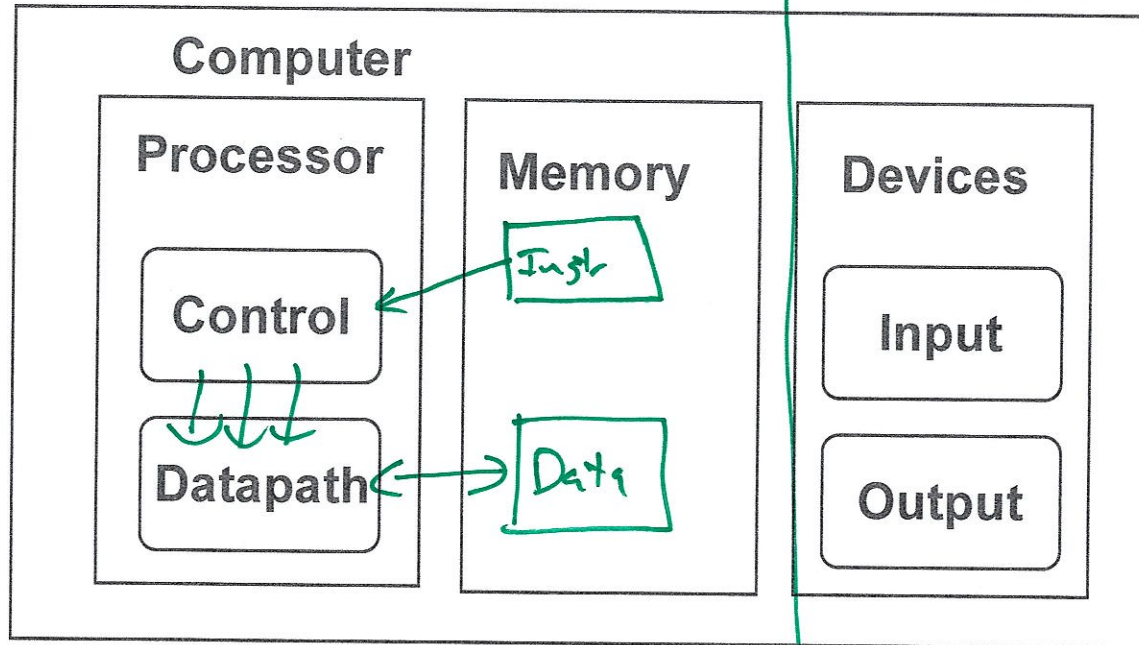
Processor only as good as software it runs

Implementing Software – The Compilation Process



Computer Organization

Five classic components



Memory: Store instructions, data

Datapath: Perform operations (Add, subtract, ...)

Control: Orchestrate operations (who does what when)

Input: Get information from the outside world

Output: Provide results

Execution cycle

