Outline of the Course

- Introduction
- Computer Interconnection Structures
- Elements of Bus Design
- Internal Memory (Cache)
- External Memory
- Input/Output
- Computer Arithmetic
- CISC vs RISC

Computer Organization and Architecture

Chapter 1
Introduction

Architecture & Organization 1

- Architecture is those attributes visible to the programmer
  - Instruction set, number of bits used for data representation, I/O mechanisms, addressing techniques.
  - e.g. Is there a multiply instruction?
- Organization is how features are implemented
  - Control signals, interfaces, memory technology.
  - e.g. Is there a hardware multiply unit or is it done by repeated addition?

Architecture & Organization 2

- All Intel x86 family share the same basic architecture

- The IBM System/370 family share the same basic architecture

- This gives code compatibility
  - At least backwards

- Organization differs between different versions

Structure & Function

- Structure is the way in which components relate to each other

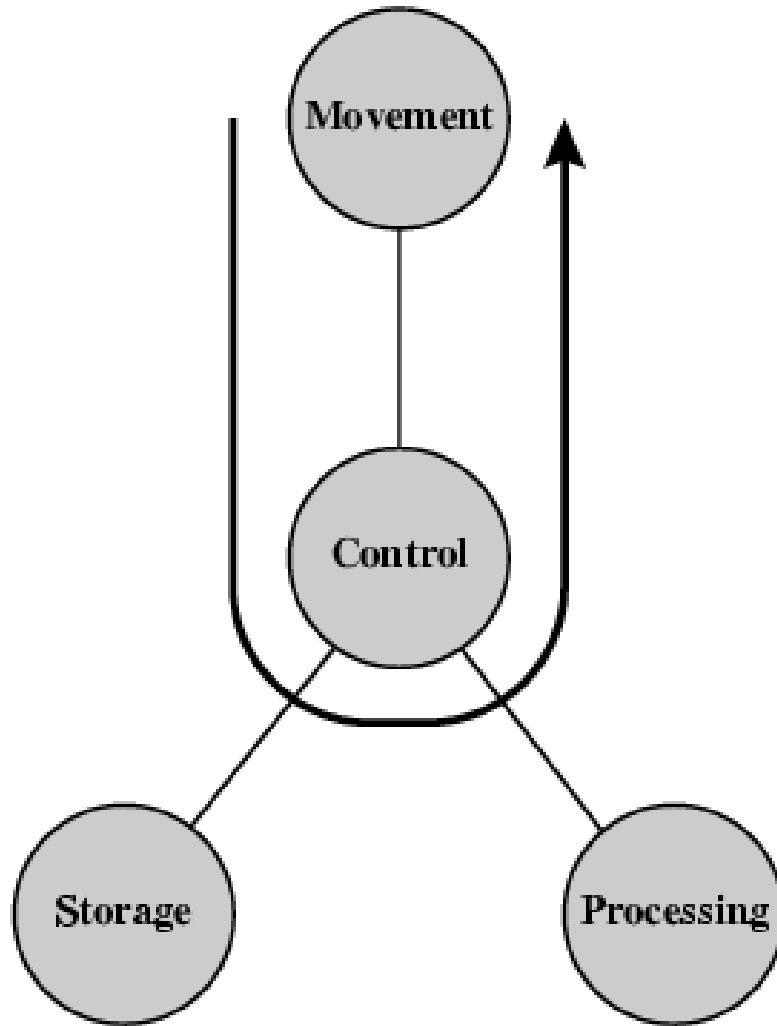- Function is the operation of individual components as part of the structure

Function

- All computer functions are:
  - Data processing
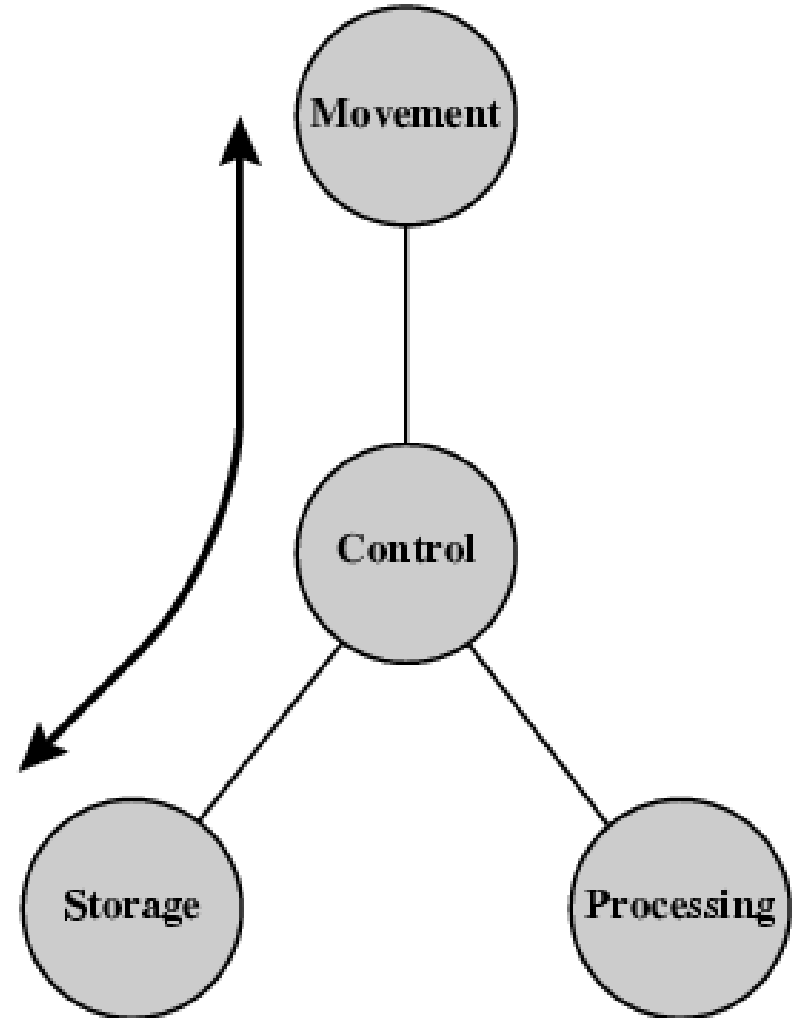 - Data storage
  - Data movement
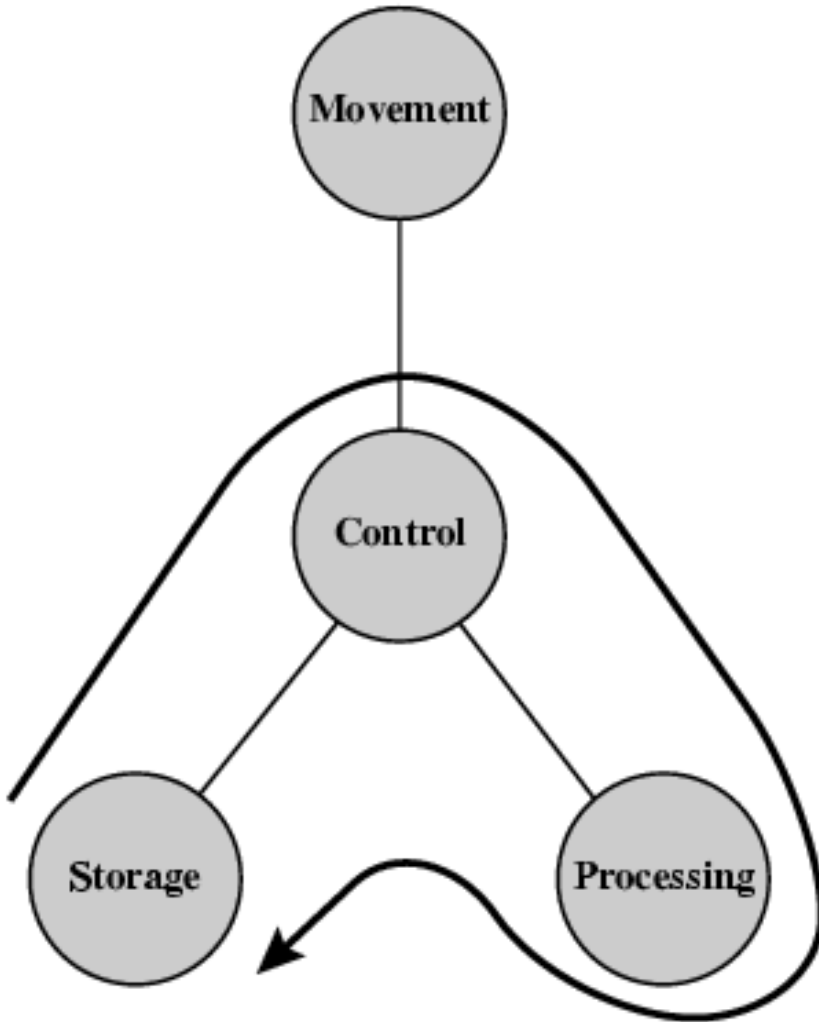 - Control
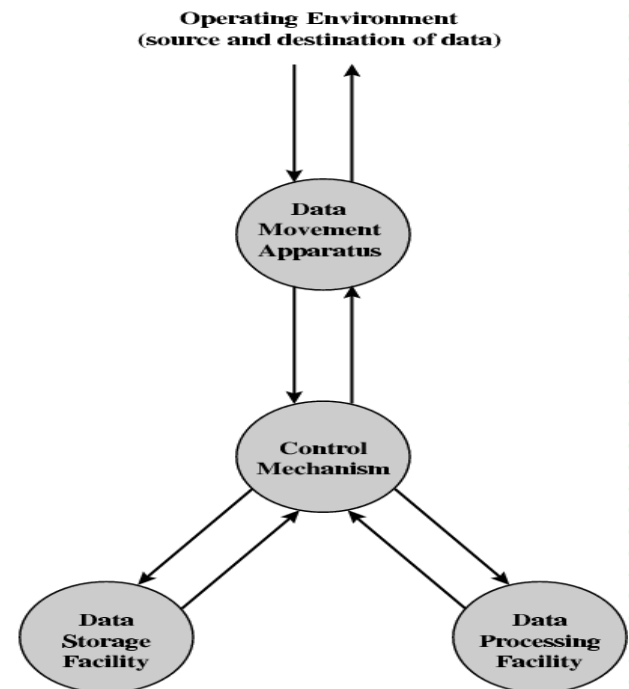
Functional View
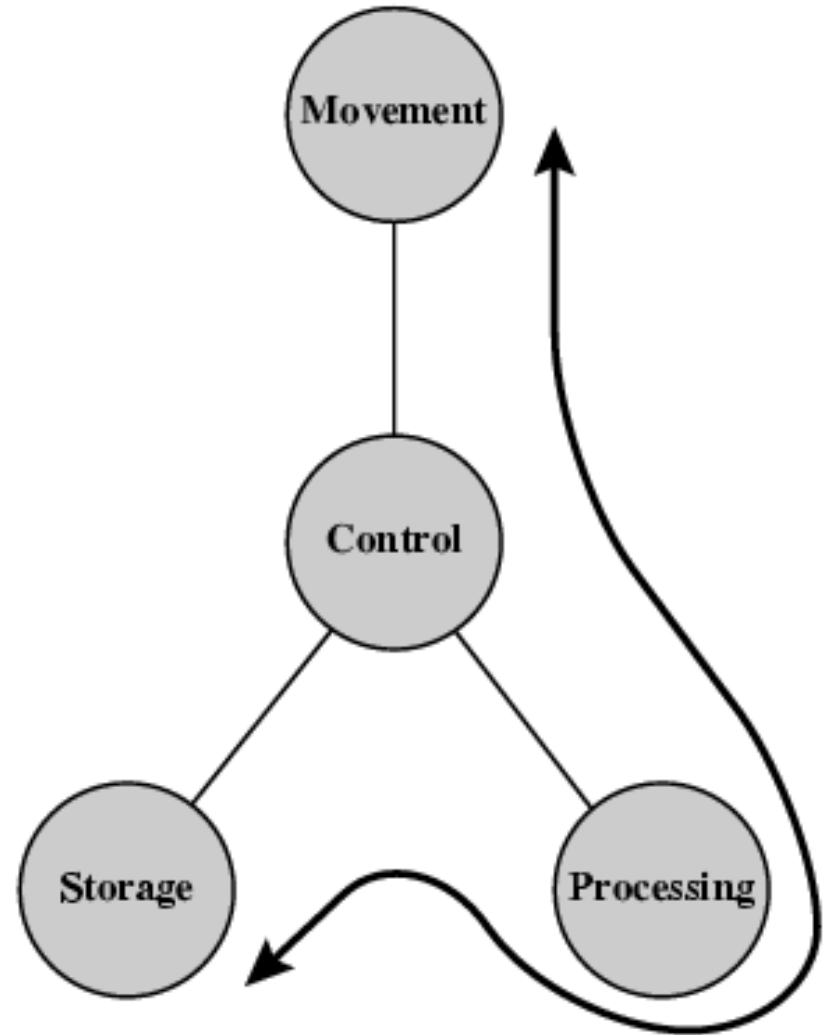
Types of Operations

Data movement   **Data Storage**

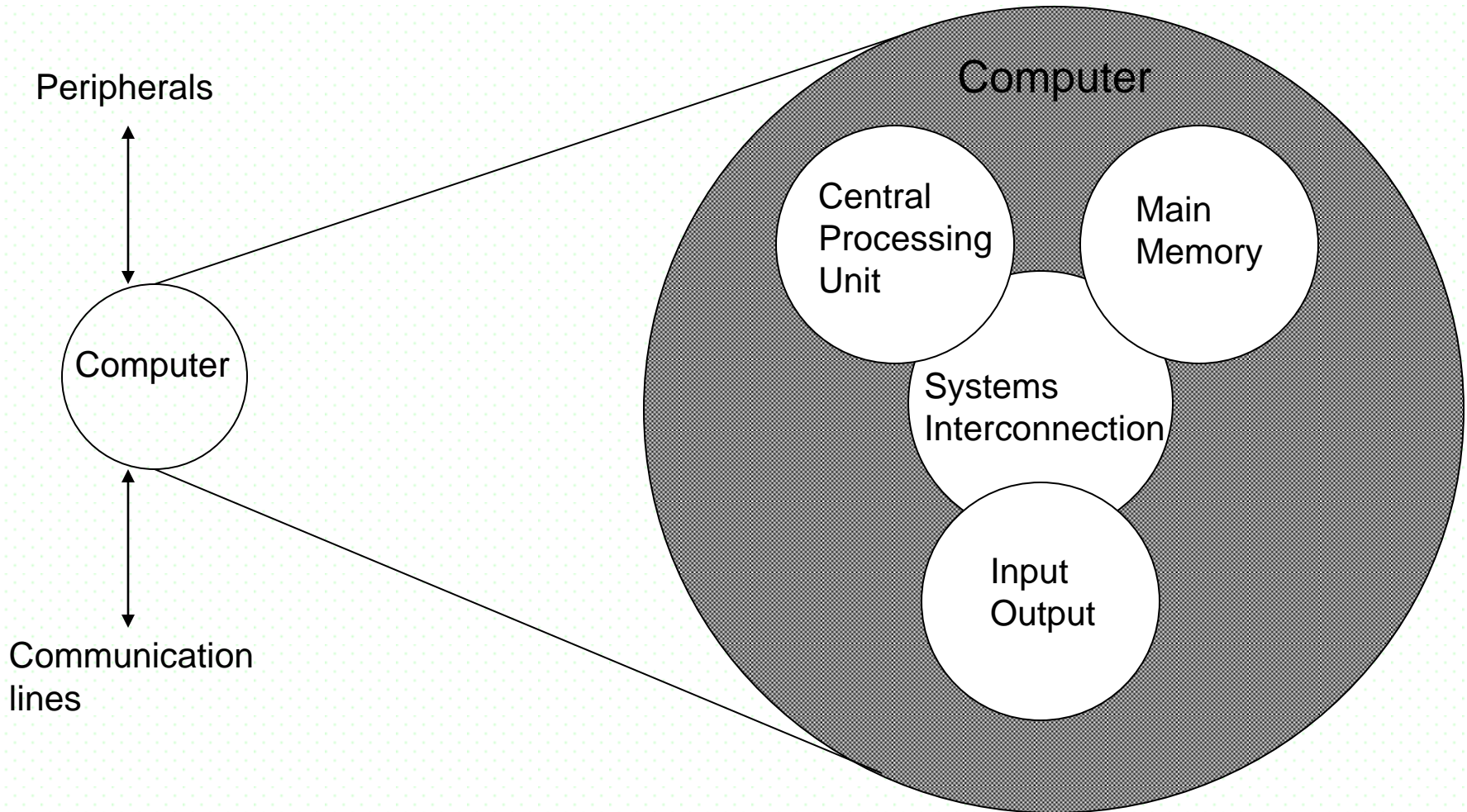# Types of Operations
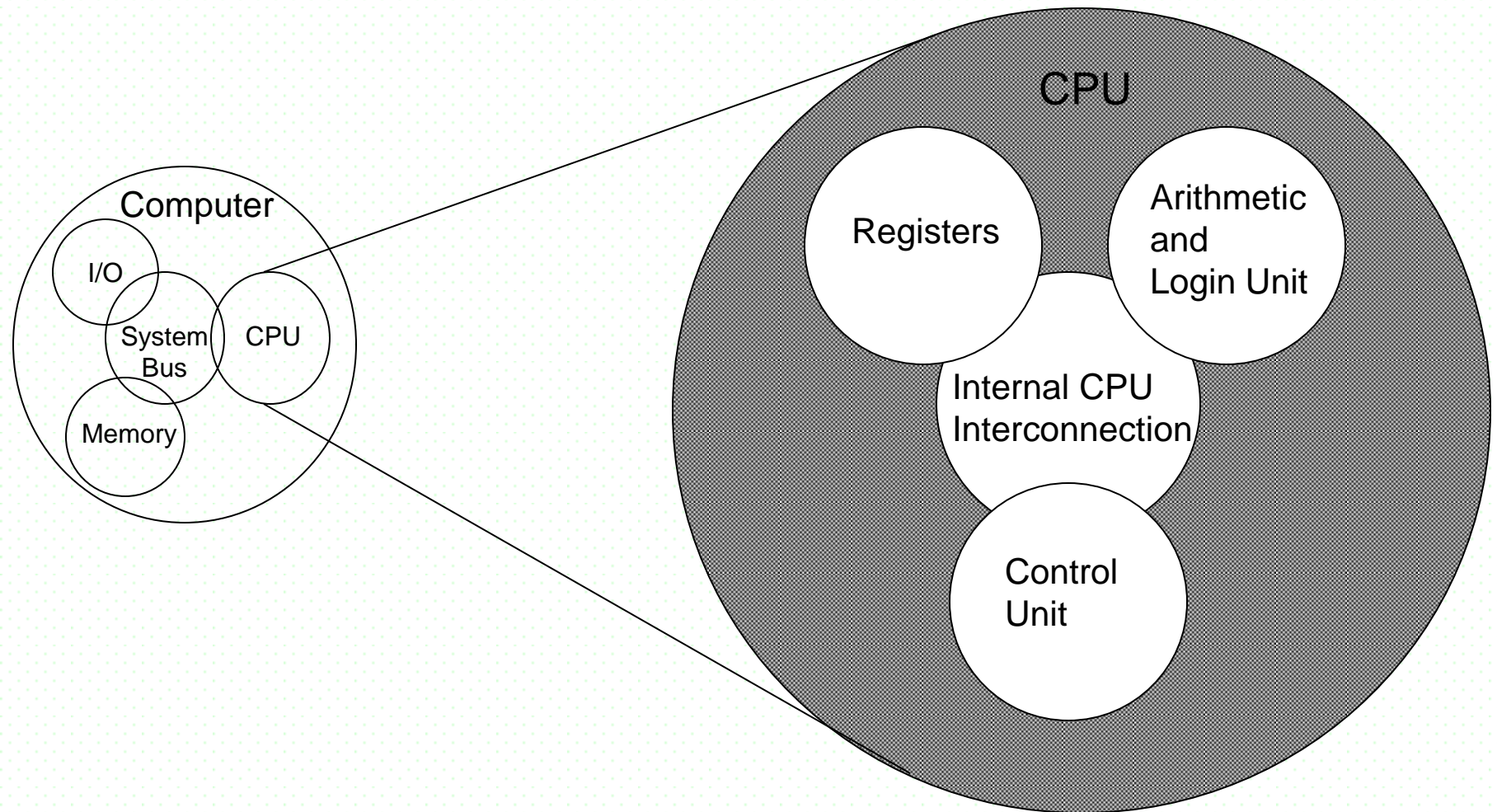

Processing from/to storage   **Processing from storage to I/O**

Structure - Top Level

Structure - The CPU

Structure - The Control Unit
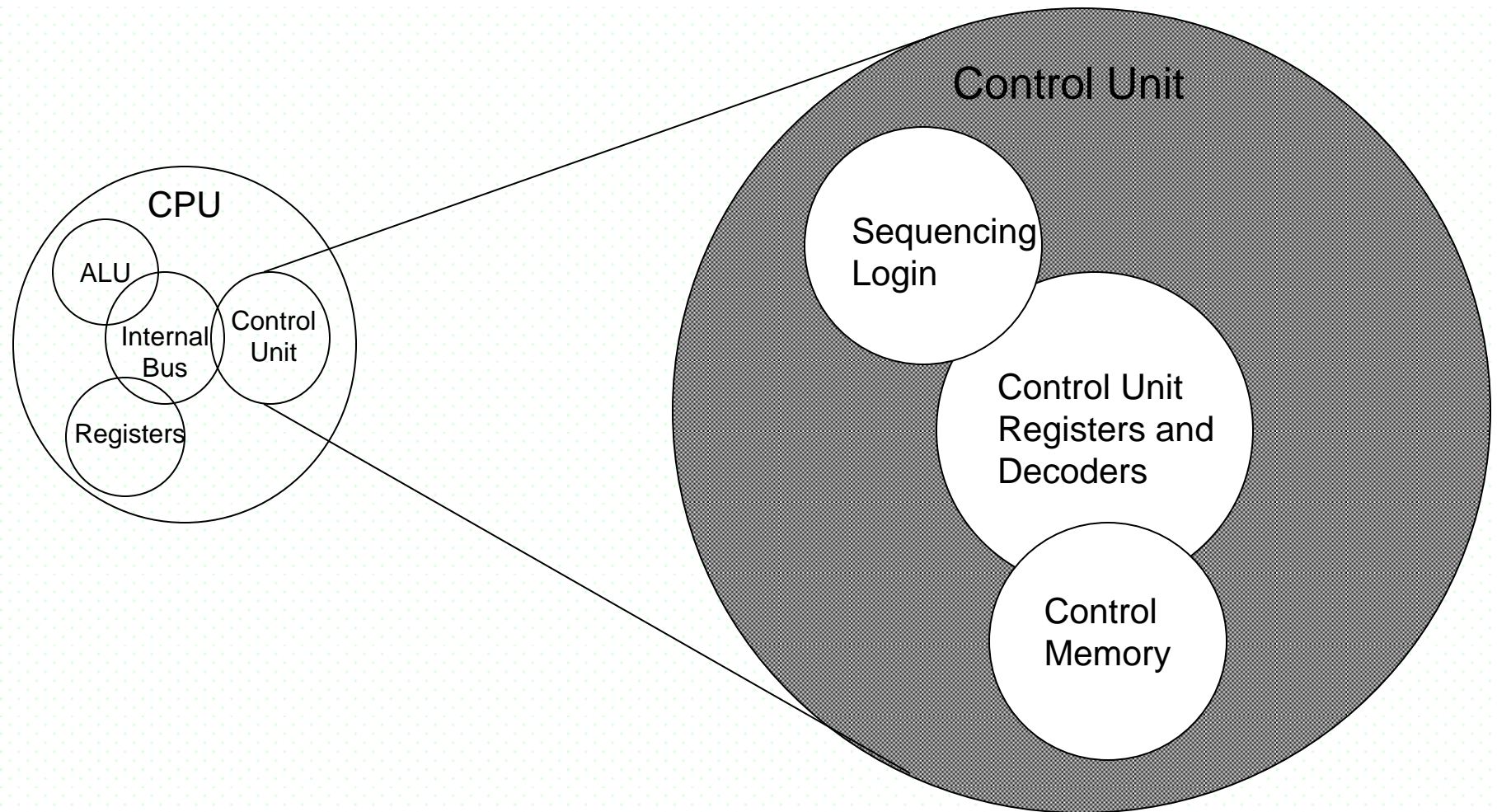
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