Basics

Chapter 1

Introduction and Overview

Importance Of Architecture

- Why should software folks study hardware ?
  - To write smaller, faster code, less prone to errors
  - Appreciate relative cost of operations
  - Effects of programming choices
  - Better debugging

Learning The Essentials

- Digital hardware used in building computer systems is extremely complex.
- Complex design, and interconnections
- Technologies rapidly evolve
- Our approach
  - Broad concepts over low-level technical details
  - EE background not required

What We'll Cover

- Basics
  - Digital logic
  - Data representation
- Processors: computation and control
  - CPU
- Memory: storage and access of digital information
  - Physical, virtual memory
  - Caching

What We'll Cover

- I/O: Interconnection of computers and devices
  - Bus communication
  - Device driver software
- Advanced topics
  - Parallelism
  - Pipelining

What We'll Omit

- Depth (instead focus on breadth)
- Details (instead focus on concepts)
- Certain internal structures of components