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Autore	Abd-El-Barr Mostafa <1950->
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References and Further Reading; 5. Processing Unit Design; 5.1. CPU Basics; 5.2. Register Set; 5.3. Datapath; 5.4. CPU Instruction Cycle; 5.5. Control Unit; 5.6. Summary; Exercises; References; 6. Memory System Design I; 6.1. Basic Concepts; 6.2. Cache Memory 6.3. Summary Exercises; References and Further Reading; 7. Memory System Design II; 7.1. Main Memory; 7.2. Virtual Memory; 7.3. Read-Only Memory; 7.4. Summary; Exercises; References and Further Reading; 8. Input-Output Design and Organization; 8.1. Basic Concepts; 8.2. Programmed I/O; 8.3. Interrupt-Driven I/O; 8.4. Direct Memory Access (DMA); 8.5. Buses; 8.6. Input-Output Interfaces; 8.7. Summary; Exercises; References and Further Reading; 9 Pipelining Design Techniques; 9.1. General Concepts; 9.2. Instruction Pipeline; 9.3. Example Pipeline Processors; 9.4. Instruction-Level Parallelism 9.5. Arithmetic Pipeline 9.6. Summary; Exercises; References and Further Reading; 10 Reduced Instruction Set Computers (RISCs); 10.1. RISC/CISC Evolution Cycle; 10.2. RISCs Design Principles; 10.3. Overlapped Register Windows; 10.4. RISCs Versus CISCs; 10.5. Pioneer (University) RISC Machines; 10.6. Example of Advanced RISC Machines; 10.7. Summary; Exercises; References and Further Reading; 11 Introduction to Multiprocessors; 11.1. Introduction; 11.2. Classification of Computer Architectures; 11.3. SIMD Schemes; 11.4. MIMD Schemes; 11.5. Interconnection Networks 11.6. Analysis and Performance Metrics 11.7. Summary; Exercises; References and Further Reading; Index

Sommario/riassunto

This is the first book in the two-volume set offering comprehensive coverage of the field of computer organization and architecture. This book provides complete coverage of the subjects pertaining to introductory courses in computer organization and architecture, including:

- * Instruction set architecture and design
- * Assembly language programming
- * Computer arithmetic
- * Processing unit design
- * Memory system design
- * Input-output design and organization
- * Pipelining design techniques
- * Reduced Instruction Set Computers (RISCs)

The authors, who share over 15 years of
