

<<计算机科学导论>>

图书基本信息

书名：<<计算机科学导论>>

13位ISBN编号：9787302232964

10位ISBN编号：7302232962

出版时间：2010-9

出版时间：清华大学出版社

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页数：695

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内容概要

随着计算机应用的普及，“计算机科学导论”课程不再是教授学生使用字处理器、数据库、电子表格、演示软件和电子邮件了，也不是只限于诸如Web页面设计和交互式图形的“娱乐”应用，而是还应包含诸如算法、硬件设计、计算机组织结构、系统软件、语言模型、计算理论以及计算机社会与伦理问题等知识。

对这些核心知识的介绍，将向学生展示整个计算机领域的丰富和华美。

它不仅使得学生可以高效地使用计算机和软件，而且还可以鉴赏计算机和软件的创建和实现背后的基本思想。

本书就是针对“计算机科学导论”课的这种改革而编写的。

本书全面地介绍了该学科的内容，无需读者有计算机科学、程序设计或数学等背景知识。

本书不仅适合用作计算机及相关专业学生的课程，也非常适合用作高中计算机科学课程的教材。

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插图：The discussions in Level 1 assume that our algorithms are executed by something called a "computing agent," an abstract concept for any entity that can effectively carry out the instructions in our solution. However, in Level 2 (Chapters 4-5), "The Hardware World," we want our algorithms to be executed by "real" computers to produce "real" results. Thus begins our discussion of hardware, logic design, and computer organization. The initial discussion introduces the basic building blocks of computer systems——binary numbers, Boolean logic, gates, and circuits. It then shows how these elementary concepts are used to construct a real computer using the classic Von Neumann architecture, including processors, memory, buses, and input/output. It presents a typical machine language instruction set and explains how the algorithms of Level 1 can be represented in machine language and run on the Von Neumann hardware of Level 2, conceptually tying together these two areas. It ends with a discussion of important new directions in hardware design——multicore and massively parallel machines. By the end of Level 2 students have been introduced to some basic concepts in logic design and computer organization, and they understand and appreciate the enormous complexity of these areas. This complexity is the motivation for Level 3 (Chapters 6-8), "The Virtual Machine." This section describes how system software produces a more friendly, user-oriented problem-solving environment that hides many of the ugly hardware details just described. Level 3 looks at the same problem discussed in Level 2, encoding and executing an algorithm, but shows how much easier this is in a virtual environment containing software tools like editors, translators, and loaders. This section also discusses the services and responsibilities of operating systems and how operating systems have evolved. It investigates one of the most important virtual environments in current use——a network of computers. It shows how systems such as the Ethernet, Internet, and the Web are created from computers linked together via transmission media and communications software.

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《计算机科学导论(第5版)(影印版)》是大学计算机教育国外著名教材系列。

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