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Low-Level Programming

C, Assembly, and Program Execution on Intel® 64 Architecture

1st edition

Igor Zhirkov

Apress

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Learn Intel 64 assembly language and architecture, become proficient in C, and understand how the programs are compiled and executed down to machine instructions, enabling you to write robust, high-performance code.Low-Level Programming explains Intel 64 architecture as the result of von Neumann architecture evolution. The book teaches the latest version of the C language (C11) and assembly language from scratch. It covers the entire path from source code to program execution, including generation of ELF object files, and static and dynamic linking. Code examples and exercises are included along with the best code practices. Optimization capabilities and limits of modern compilers are examined, enabling you to balance between program readability and performance. The use of various performance-gain techniques is demonstrated, such as SSE instructions and pre-fetching. Relevant Computer Science topics such as models of computation and formal grammars are addressed, and their practical value explained.What You'll LearnLow-Level Programming teaches...

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FEATURES

- Teaches how to use x64 assembly language to write low-level code for performance-critical programs Shows how to compile and execute low-level code in C inside the Intel 64 hardware and OS framework
- Provides practice of a variety of optimization, debugging, and performance-gain techniques

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