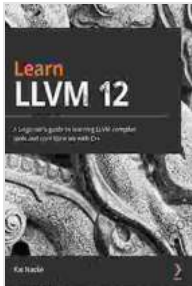


Beginner's Guide to LLVM Compiler Tools and Core Libraries: Your Journey to Mastering Low-Level Optimization



Learn LLVM 12: A beginner's guide to learning LLVM compiler tools and core libraries with C++ by Kai Nacke

★★★★☆ 4.2 out of 5

Language : English
File size : 2442 KB
Text-to-Speech : Enabled
Enhanced typesetting : Enabled
Print length : 392 pages
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In today's high-performance computing landscape, optimizing code for speed and efficiency is crucial. The LLVM Compiler Infrastructure provides a powerful set of tools and core libraries that empower developers to harness the potential of low-level optimization. This beginner's guide will embark you on an enlightening journey into the world of LLVM, equipping you with the knowledge and skills to master compiler technology and unlock the full potential of your code.

Chapter 1: to LLVM

Begin your LLVM journey by understanding its fundamental concepts, architecture, and the benefits it offers. We'll explore the role of LLVM in the compilation process, from source code to machine code, and delve into the key components that make LLVM a versatile and extensible framework.

Chapter 2: Getting Started with LLVM Tools

Get hands-on with essential LLVM tools, including the LLVM debugger (LLDB), the optimizer (opt), and the disassembler (llvm-dis). Learn how to use these tools to analyze, optimize, and debug your code, gaining valuable insights into its behavior and performance.

Chapter 3: Understanding LLVM Intermediate Representation

Dive into the heart of LLVM: its Intermediate Representation (IR). Discover how IR serves as a bridge between high-level source code and low-level assembly, enabling optimizations and portability across different architectures. We'll explore the structure of IR, its types, and how to manipulate it effectively.

Chapter 4: Core LLVM Libraries

Explore the rich collection of LLVM core libraries, including the Execution Engine for Just-in-Time (JIT) compilation, the Code Generator for efficient assembly emission, and the Static Analyzer for identifying potential errors and performance issues. Gain practical experience in utilizing these libraries to enhance your code's efficiency and reliability.

Chapter 5: Advanced LLVM Techniques

As you master the basics, delve into advanced LLVM techniques that will elevate your optimization skills. We'll cover loop optimization, vectorization, and auto-tuning, empowering you to extract maximum performance from your code. Additionally, you'll learn about the LLVM pass manager, giving you the flexibility to customize the optimization process.

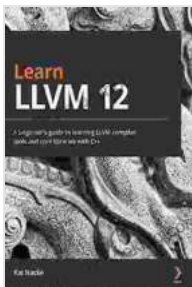
Chapter 6: Case Studies: Real-World LLVM Applications

Witness the practical power of LLVM through real-world case studies. We'll explore how LLVM is used in industry-leading projects, such as the Rust compiler, the Clang static analyzer, and the Swift runtime. These case studies will provide valuable insights into how LLVM can transform your development workflow and improve your applications.

Embark on this comprehensive journey with our Beginner's Guide to LLVM Compiler Tools and Core Libraries, and unlock the potential of low-level optimization. By mastering LLVM, you'll gain a deep understanding of compiler technology, transform your code's performance, and become an invaluable asset to any software development team.

Free Download your copy today and embark on your LLVM adventure!

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