Community Experience Distilled

Getting Started with LLVM Core Libraries

Get to grips with LLVM essentials and use the core libraries to build advanced tools

Bruno Cardoso Lopes Rafael Auler

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Getting Started With Llvm Core Libraries Auler Rafael

Michael D. Adams

Getting Started With Llvm Core Libraries Auler Rafael:

Getting Started with LLVM Core Libraries Bruno Cardoso Lopes,Rafael Auler,2014-08-26 This book is intended for enthusiasts computer science students and compiler engineers interested in learning about the LLVM framework You need a background in C and although not mandatory should know at least some compiler theory Whether you are a newcomer or a compiler expert this book provides a practical introduction to LLVM and avoids complex scenarios If you are interested enough and excited about this technology then this book is definitely for you LLVM Techniques, Tips, and Best Practices Clang and Middle-End Libraries Min-Yih Hsu,2021-04-22 Learn how you can build the next big programming language compiler or source code analyzer using LLVM and Clang Key FeaturesExplore Clang LLVM s middle end and backend in a pragmatic wayDevelop your LLVM skillset and get to grips with a variety of common use casesEngage with real world LLVM development through various coding examplesBook Description Every programmer or engineer at some point in their career works with compilers to optimize their applications Compilers convert a high level programming language into low level machine executable code LLVM provides the infrastructure reusable libraries and tools needed for developers to build their own compilers With LLVM s extensive set of tooling you can effectively generate code for different backends as well as optimize them In this book you ll explore the LLVM compiler infrastructure and understand how to use it to solve different problems You ll start by looking at the structure and design philosophy of important components of LLVM and gradually move on to using Clang libraries to build tools that help you analyze high level source code As you advance the book will show you how to process LLVM IR a powerful way to transform and optimize the source program for various purposes Equipped with this knowledge you ll be able to leverage LLVM and Clang to create a wide range of useful programming language tools including compilers interpreters IDEs and source code analyzers By the end of this LLVM book you ll have developed the skills to create powerful tools using the LLVM framework to overcome different real world challenges What you will learnFind out how LLVM s build system works and how to reduce the building resourceGet to grips with running custom testing with LLVM s LIT frameworkBuild different types of plugins and extensions for ClangCustomize Clang s toolchain and compiler flagsWrite LLVM passes for the new PassManagerDiscover how to inspect and modify LLVM IRUnderstand how to use LLVM s profile guided optimizations PGO frameworkCreate custom compiler sanitizersWho this book is for This book is for software engineers of all experience levels who work with LLVM If you are an academic researcher this book will help you learn useful LLVM skills in a short time and enable you to build your prototypes and projects quickly Programming language enthusiasts will also find this book useful for building a new programming language with the help of LLVM Lecture Slides for the Clang Libraries [LLVM/Clang 15] (Edition 0.1.0) Michael D. Adams,2023-08-03 Lecture Slides for the Clang Libraries [LLVM/Clang 17] (Edition 0.2.0) Michael D. Adams,2024-01-25 **Lecture Slides for the Clang Libraries [LLVM/Clang 20] (Edition 0.3.0)** Michael D. Adams,2025-03-07 **LLVM**

Essentials Suyog Sarda,Mayur Pandey,2015-12-21 Become familiar with the LLVM infrastructure and start using LLVM libraries to design a compiler About This Book Learn to use the LLVM libraries to emit intermediate representation IR from high level language Build your own optimization pass for better code generation Understand AST generation and use it in a meaningful way Who This Book Is For This book is intended for those who already know some of the concepts of compilers and want to quickly get familiar with the LLVM infrastructure and the rich set of libraries that it provides What You Will Learn Get an introduction to LLVM modular design and LLVM tools Convert frontend code to LLVM IR Implement advanced LLVM IR paradigms Understand the LLVM IR Optimization Pass Manager infrastructure and write an optimization pass Absorb LLVM IR transformations Understand the steps involved in converting LLVM IR to Selection DAG Implement a custom target using the LLVM infrastructure Get a grasp of C s frontend clang an AST dump and static analysis In Detail LLVM is currently the point of interest for many firms and has a very active open source community It provides us with a compiler infrastructure that can be used to write a compiler for a language It provides us with a set of reusable libraries that can be used to optimize code and a target independent code generator to generate code for different backends It also provides us with a lot of other utility tools that can be easily integrated into compiler projects This book details how you can use the LLVM compiler infrastructure libraries effectively and will enable you to design your own custom compiler with LLVM in a snap We start with the basics where you ll get to know all about LLVM We then cover how you can use LLVM library calls to emit intermediate representation IR of simple and complex high level language paradigms Moving on we show you how to implement optimizations at different levels write an optimization pass generate code that is independent of a target and then map the code generated to a backend The book also walks you through CLANG IR to IR transformations advanced IR block transformations and target machines By the end of this book you ll be able to easily utilize the LLVM libraries in your own projects Style and approach This book deals with topics sequentially increasing the difficulty level in a step by step approach Each topic is explained with a detailed example and screenshots are included to help you understand the examples LLVM Cookbook Mayur Pandey,Suyog Sarda,2015-05-30 The book is for compiler programmers who are familiar with concepts of compilers and want to indulge in understanding exploring and using LLVM infrastructure in a meaningful way in their work This book is also for programmers who are not directly involved in compiler projects but are often involved in development phases where they write thousands of lines of code With knowledge of how compilers work they will be able to code in an optimal way and improve performance with clean code **LLVM: инфраструктура для разработки компиляторов** Бруно Лопес,Рафаэль Аулер,2022-01-29 LLVM LLVM LLVM LLVM JIT LLVM LLVM C

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