Implementing Domain-Specific Languages with Xtext and Xtend - Second Edition

By Lorenzo Bettini

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Learn how to implement a DSL with Xtext and Xtend using easy-to-understand examples and best practices

About This Book

- Leverage the latest features of Xtext and Xtend to develop a domain-specific language.
- Integrate Xtext with popular third party IDEs and get the best out of both worlds.
- Discover how to test a DSL implementation and how to customize runtime and IDE aspects of the DSL

Who This Book Is For

This book is targeted at programmers and developers who want to create a domain-specific language with Xtext. They should have a basic familiarity with Eclipse and its functionality. Previous experience with compiler implementation can be helpful but is not necessary since this book will explain all the development stages of a DSL.

What You Will Learn

- Write Xtext grammar for a DSL;
- Use Xtend as an alternative to Java to write cleaner, easier-to-read, and more maintainable code;
- Build your Xtext DSLs easily with Maven/Tycho and Gradle;
- Write a code generator and an interpreter for a DSL;
- Explore the Xtext scoping mechanism for symbol resolution;
- Test most aspects of the DSL implementation with JUnit;
- Understand best practices in DSL implementations with Xtext and Xtend;
- Develop your Xtext DSLs using Continuous Integration mechanisms;
- Use an Xtext editor in a web application

In Detail

Xtext is an open source Eclipse framework for implementing domain-specific languages together with IDE functionalities. It lets you implement languages really quickly; most of all, it covers all aspects of a complete language infrastructure, including the parser, code generator, interpreter, and more.

This book will enable you to implement Domain Specific Languages (DSL) efficiently, together with their IDE tooling, with Xtext and Xtend. Opening with brief coverage of Xtext features involved in DSL implementation, including integration in an IDE, the book will then introduce you to Xtend as this language will be used in all the examples throughout the book. You will then explore the typical programming development workflow with Xtext when we modify the grammar of the DSL.

Further, the Xtend programming language (a fully-featured Java-like language tightly integrated with Java) will be introduced. We then explain the main concepts of Xtext, such as validation, code generation, and customizations of runtime and UI aspects. You will have learned how to test a DSL implemented in Xtext with JUnit and will progress to advanced concepts such as type checking and scoping. You will then integrate the typical Continuous Integration systems built in to Xtext DSLs and familiarize yourself with Xbase. By the end of the book, you will manually maintain the EMF model for an Xtext DSL and will see how an Xtext DSL can also be used in IntelliJ.

Style and approach

A step-by step-tutorial with illustrative examples that will let you master using Xtext and implementing DSLs with its custom language, Xtend.

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Editorial Review

About the Author

Lorenzo Bettini

Lorenzo Bettini is an associate professor in computer science at the Dipartimento di Statistica, Informatica, Applicazioni "Giuseppe Parenti," Universita di Firenze, Italy. Previously, he was a researcher in computer science at Dipartimento di Informatica, Universita di Torino, Italy. He also was a Postdoc and a contractual researcher at Dipartimento di Sistemi e Informatica, Universita di Firenze, Italy. He has a masters degree summa cum laude in computer science and a PhD in "Logics and Theoretical Computer Science." His research interests cover design, theory, and the implementation of programming languages (in particular, object-oriented languages and network-aware languages). He has been using Xtext since version 0.7. He has used Xtext and Xtend for implementing many domain-specific languages and Java-like programming languages. He also contributed to Xtext, and he recently became an Xtext committer. He is the author of the first edition of the book "Implementing Domain-Specific Languages with Xtext and Xtend", published by Packt Publishing (August 21, 2013). He is also the author of about 80 papers published in international conferences and international journals. You can contact him at http://www.lorenzobettini.it.

Users Review

From reader reviews:

Ruby Pritchett:

This Implementing Domain-Specific Languages with Xtext and Xtend - Second Edition book is just not ordinary book, you have after that it the world is in your hands. The benefit you get by reading this book is actually information inside this guide incredible fresh, you will get facts which is getting deeper you read a lot of information you will get. This particular Implementing Domain-Specific Languages with Xtext and Xtend - Second Edition without we understand teach the one who reading it become critical in considering and analyzing. Don't be worry Implementing Domain-Specific Languages with Xtext and Xtend - Second Edition can bring any time you are and not make your tote space or bookshelves' turn into full because you can have it in the lovely laptop even cellphone. This Implementing Domain-Specific Languages with Xtext and Xtend - Second Edition having excellent arrangement in word in addition to layout, so you will not really feel uninterested in reading.

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