



Implementing Domain-Specific Languages with Xtext and Xtend

By *Lorenzo Bettini*

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Implementing Domain-Specific Languages with Xtext and Xtend By Lorenzo Bettini

If you know Eclipse then learning how to implement a DSL using Xtext is a natural progression. And this guide makes it easy to get started through a step-by-step approach accompanied with simple examples.

Overview

- Learn to quickly develop a domain-specific language with Xtext
- Implement any aspect of a DSL using Xtend, a fully featured Java-like programming language
- Discover how to test a DSL implementation and how to customize runtime and IDE aspects of the DSL

In Detail

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

"Implementing Domain-Specific Languages with Xtext and Xtend" will teach you how to develop a DSL with Xtext, an Eclipse framework for implementing domain-specific languages. The chapters are like tutorials that describe the main concepts of Xtext such as grammar definition, validation, code generation, customizations, and many more, through uncomplicated and easy-to-understand examples.

Starting with briefly covering the features of Xtext that are involved in a 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. We then proceed by explaining the main concepts of Xtext, such as validation, code generation, and customizations of runtime and UI aspects. By the end of the book, you will have learned how to test a DSL implemented in Xtext with Junit, in order to follow a test-driven development strategy that will help the developer implement maintainable code that is much faster and cleaner.

A test-driven approach is used throughout the book when presenting advanced concepts such as type checking and scoping. The book also shows you how to build and release a DSL so that it can be installed in Eclipse, and gives you hints on how to build the DSL headlessly in a continuous integration server.

"Implementing Domain-Specific Languages with Xtext and Xtend" aims to complement the official Xtext documentation to explain the main concepts through simplified examples and to teach the best practices for a DSL implementation in Xtext. It is a Beginner's Guide which should set you up for professional development DSL and its Eclipse IDE tooling.

What you will learn from this book

- Learn to write an Xtext grammar for a DSL
- Use Xtend as an alternative to Java to write cleaner, easier-to-read, and more maintainable code
- Write constraint checks for a DSL using the validator mechanism
- Learn how to write a code generator and an interpreter for a DSL
- Discover how automatic symbol resolution works in Xtext and how to customize it
- Build and deploy a DSL implementation so that others can install it
- Get well versed with the typical Xtext development workflow

Approach

A step-by-step guide that enables you to quickly implement a DSL with Xtext and Xtend in a test-driven way with the aid of simplified examples.

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Editorial Review

About the Author

Lorenzo Bettini

Lorenzo Bettini is an assistant professor (Researcher) in computer science at Dipartimento di Informatica, Università di Torino, Italy. Previously, he was a Postdoc and a contractual researcher at Dipartimento di Sistemi e Informatica, Università di Firenze, Italy.

He has a Masters Degree in computer science and a PhD in 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 is also the author of about 60 papers published in international conferences and international journals.

You can contact him at <http://www.lorenzobettini.it>.

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