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Domain-Specific Languages **Implementing Domain-Specific Languages with Xtext and Xtend** **Formal and Practical Aspects of Domain-Specific Languages: Recent Developments** Domain Specific Languages **Domain-Specific Languages in Practice** **Language Implementation Patterns** Language Implementation Patterns **Software Language Engineering** **Domain-Specific Languages in R** The Acquisition of Verbs and their Grammar: Domain-Specific Languages **Variable Domain-specific Software Languages with DjDSL** *Domain-Specific Languages* **Globalizing Domain-Specific Languages** **Teaching World Languages for Specific Purposes** **Groovy for Domain-specific Languages** DSL Engineering Domain-Specific Languages of Mathematics *The Crosslinguistic Study of Language Acquisition* **DSLs in Action Proceedings of the 2nd International Workshop on Real World Domain Specific Languages Through the Language Glass** **Language and Space** **Language Typology** *Teacher Education for Languages for Specific Purposes* **Teaching Languages to Students with Specific Learning Differences** **Languages for Specific Purposes in the Digital Era** *Domain-specific Languages* **Language Acquisition in Diverse Linguistic, Social and Cognitive Circumstances** **The Language Instinct** *Languages for Specific Purposes in History* *Design Process for Application-specific Languages* **Linguistics and Second Language Pedagogy** Assessing Languages for Specific Purposes **Generic Tools, Specific Languages** Clojure for Domain-specific Languages *The Handbook of Historical Linguistics, Volume II* *Children with Specific Language Impairment Recent Advances in Language and Communication* Simulation, Modeling, and Programming for Autonomous Robots

"This book presents current research on all aspects of domain-specific language for scholars and practitioners in the software engineering fields, providing new results and answers to open problems in DSL research"-- This textbook describes the theory and the pragmatics of using and engineering high-level software languages – also known as modeling or domain-specific languages (DSLs) – for creating quality software. This includes methods, design patterns, guidelines, and testing practices for defining the syntax and the semantics of languages. While remaining close to technology, the book covers multiple paradigms and solutions, avoiding a particular technological silo. It unifies the modeling, the object-oriented, and the functional-programming perspectives on DSLs. The book has 13 chapters. Chapters 1 and 2 introduce and motivate DSLs. Chapter 3 kicks off the DSL engineering lifecycle, describing how to systematically develop abstract syntax by analyzing a domain. Chapter 4 addresses the concrete syntax, including the systematic engineering of context-free grammars. Chapters 5 and 6 cover the static semantics – with basic constraints as a starting point and type systems for advanced DSLs. Chapters 7 (Transformation), 8 (Interpretation), and 9 (Generation) describe different paradigms for designing and implementing the dynamic semantics, while covering testing and other kinds of quality assurance. Chapter 10 is devoted to internal DSLs. Chapters 11 to 13 show the application of DSLs and engage with simpler alternatives to DSLs in a highly distinguished domain: software variability. These chapters introduce the underlying notions of software product lines and feature modeling. The book has been developed based on courses on model-driven software engineering (MDSE) and DSLs held by the authors. It aims at senior undergraduate and junior graduate students in computer science or software engineering. Since it includes examples and lessons from industrial and open-source projects, as well as from industrial research, practitioners will also find it a useful reference. The numerous examples include code in Scala 3, ATL, Alloy, C#, F#, Groovy, Java, JavaScript, Kotlin, OCL, Python, QVT, Ruby, and Xtend. The book contains as many as 277 exercises. The associated code repository facilitates learning and using the examples in a course. This book details the conceptual foundations, design and implementation of the domain-specific language (DSL) development system DjDSL. DjDSL facilitates design-decision-making on and implementation of reusable DSL and DSL-product lines, and represents the state-of-the-art in language-based and composition-based DSL development. As such, it unites elements at the crossroads between software-language engineering, model-driven software engineering, and feature-oriented software engineering. The book is divided into six chapters. Chapter 1 (“DSL as Variable Software”) explains the notion of DSL as variable software in greater detail and introduces readers to the idea of software-product line engineering for DSL-based software systems. Chapter 2 (“Variability Support in DSL Development”) sheds light on a number of interrelated dimensions of DSL variability: variable development processes, variable design-decisions, and variability-implementation techniques for DSL. The three subsequent chapters are devoted to the key conceptual and technical contributions of DjDSL: Chapter 3 (“Variable Language Models”) explains how to design and implement the abstract syntax of a DSL in a variable manner. Chapter 4 (“Variable Context Conditions”) then provides the means to refine an abstract syntax (language model) by using composable context conditions (invariants). Next, Chapter 5 (“Variable Textual Syntaxes”) details solutions to implementing variable textual syntaxes for different types of DSL. In closing, Chapter 6 (“A Story of a DSL Family”) shows how to develop a mixed DSL in a step-by-step manner, demonstrating how the previously introduced techniques can be employed in an advanced example of developing a DSL family. The book is intended for readers interested in language-oriented as well as model-driven software development, including software-engineering researchers and advanced software developers alike. An understanding of software-engineering basics (architecture, design, implementation, testing) and software patterns is essential. Readers should especially be familiar with the basics of object-oriented modelling (UML, MOF, Ecore) and programming (e.g., Java). Software practitioners are rapidly discovering the immense value of Domain-Specific Languages (DSLs) in solving problems within clearly definable problem domains. Developers are applying DSLs to improve productivity and quality in a wide range of areas, such as finance, combat simulation, macro scripting, image generation, and more. But until now, there have been few practical resources that explain how DSLs work and how to construct them for optimal use. Software Language Engineering fills that need. Written by expert DSL consultant Anneke Kleppe, this is the first comprehensive guide to successful DSL design. Kleppe systematically introduces and explains every ingredient of an effective language specification, including its description of concepts, how those concepts are denoted, and what those concepts mean in relation to the problem domain. Kleppe carefully illuminates good design strategy, showing how to maximize the flexibility of the languages you create. She also demonstrates powerful techniques for creating new DSLs that cooperate well with general-purpose languages and leverage their power. Completely tool-independent, this book can serve as the primary resource for readers using Microsoft DSL tools, the Eclipse Modeling Framework, openArchitectureWare, or any other DSL toolset. It contains multiple examples, an illustrative running case study, and insights and background information drawn from Kleppe’s leading-edge work as a DSL researcher. Specific topics covered include Discovering the types of problems that DSLs can solve, and when to use them Comparing DSLs with general-purpose languages, frameworks, APIs, and other approaches Understanding the roles and tools available to language users and engineers Creating each component of a DSL specification Modeling both concrete and abstract syntax Understanding and describing language semantics Defining textual and visual languages based on object-oriented metamodeling and graph transformations Using metamodels and associated tools to generate grammars Integrating object-oriented modeling with graph theory Building code generators for new languages Supporting multilanguage models and programs This book provides software engineers with all the guidance they need to create DSLs that solve real problems more rapidly, and with higher-quality code. The development of modern complex software-intensive systems often involves the use of multiple DSMLs that capture different system aspects. Supporting coordinated use of DSMLs leads to what we call the globalization of modeling languages, that is, the use of multiple modeling languages to support coordinated development of diverse aspects of a system. In this book, a number of articles describe the vision and the way globalized DSMLs currently assist integrated DSML support teams working on systems that span many domains and concerns to determine how their work on a particular aspect influences work on other aspects. Globalized DSMLs offer support for communicating relevant information, and for coordinating development activities and associated technologies within and across teams, in addition to providing support for imposing control over development artifacts produced by multiple teams. DSMLs can be used to support socio-technical coordination by providing the means for stakeholders to bridge the gap between how they perceive a problem and its solution, and the programming technologies used to implement a solution. They also support coordination of work across multiple teams. DSMLs developed in an independent manner to meet the specific needs of domain experts have an associated framework that regulates interactions needed to support collaboration and work coordination across different system domains. The articles in the book describe how multiple heterogeneous modeling languages (or DSMLs) can be related to determine how different aspects of a system influence each other. The book includes a research roadmap that broadens the current DSML research focus beyond the development of independent DSMLs to one that provides support for globalized DSMLs. Explores the direct relation of

modern CALL (Computer-Assisted Language Learning) to aspects of natural language processing for theoretical and practical applications, and worldwide demand for formal language education and training that focuses on restricted or specialized professional domains. Unique in its broad-based, state-of-the-art, coverage of current knowledge and research in the interrelated fields of computer-based learning and teaching and processing of specialized linguistic domains. The articles in this book offer insights on or analyses of the current state and future directions of many recent key concepts regarding the application of computers to natural languages, such as: authenticity, personalization, normalization, evaluation. Other articles present fundamental research on major techniques, strategies and methodologies that are currently the focus of international language research projects, both of a theoretical and an applied nature. Teaching World Languages for Specific Purposes provides learner-centered strategies, models, and resources for the development of WLSP curricula. This guide bridges theory and practice, inviting scholars, educators, and professionals of all areas of world language specialization to create new opportunities for their students. An entirely new follow-up volume providing a detailed account of numerous additional issues, methods, and results that characterize current work in historical linguistics. This brand-new, second volume of The Handbook of Historical Linguistics is a complement to the well-established first volume first published in 2003. It includes extended content allowing uniquely comprehensive coverage of the study of language(s) over time. Though it adds fresh perspectives on several topics previously treated in the first volume, this Handbook focuses on extensions of diachronic linguistics beyond those key issues. This Handbook provides readers with studies of language change whose perspectives range from comparisons of large open vs. small closed corpora, via creolistics and linguistic contact in general, to obsolescence and endangerment of languages. Written by leading scholars in their respective fields, new chapters are offered on matters such as the origin of language, evidence from language for reconstructing human prehistory, invocations of language present in studies of language past, benefits of linguistic fieldwork for historical investigation, ways in which not only biological evolution but also field biology can serve as heuristics for research into the rise and spread of linguistic innovations, and more. Moreover, it: offers novel and broadened content complementing the earlier volume so as to provide the fullest available overview of a wholly engrossing field includes 23 all-new contributed chapters, treating some familiar themes from fresh perspectives but mostly covering entirely new topics features expanded discussion of material from language families other than Indo-European provides a multiplicity of views from numerous specialists in linguistic diachrony. The Handbook of Historical Linguistics, Volume II is an ideal book for undergraduate and graduate students in linguistics, researchers and professional linguists, as well as all those interested in the history of particular languages and the history of language more generally. This work summarizes and synthesizes the substantial crime prevention literature to provide an approachable and comprehensive text for students. It sets out a critical analysis in the context of the politics of criminal justice policy. Learn to build configuration file readers, data readers, model-driven code generators, source-to-source translators, source analyzers, and interpreters. You don't need a background in computer science--ANTLR creator Terence Parr demystifies language implementation by breaking it down into the most common design patterns. Pattern by pattern, you'll learn the key skills you need to implement your own computer languages. Knowing how to create domain-specific languages (DSLs) can give you a huge productivity boost. Instead of writing code in a general-purpose programming language, you can first build a custom language tailored to make you efficient in a particular domain. The key is understanding the common patterns found across language implementations. Language Design Patterns identifies and condenses the most common design patterns, providing sample implementations of each. The pattern implementations use Java, but the patterns themselves are completely general. Some of the implementations use the well-known ANTLR parser generator, so readers will find this book an excellent source of ANTLR examples as well. But this book will benefit anyone interested in implementing languages, regardless of their tool of choice. Other language implementation books focus on compilers, which you rarely need in your daily life. Instead, Language Design Patterns shows you patterns you can use for all kinds of language applications. You'll learn to create configuration file readers, data readers, model-driven code generators, source-to-source translators, source analyzers, and interpreters. Each chapter groups related design patterns and, in each pattern, you'll get hands-on experience by building a complete sample implementation. By the time you finish the book, you'll know how to solve most common language implementation problems. The main idea behind this book is to encourage readers to approach mathematical domains from a functional programming perspective: to identify the main functions and types involved and, when necessary, to introduce new abstractions; to give calculational proofs; to pay attention to the syntax of the mathematical expressions; and, finally, to organize the resulting functions and types in domain-specific languages. The book is recommended for developers who are learning mathematics and would like to use Haskell to make sense of definitions and theorems. It is also a book for the mathematically interested who wants to explore functional programming and domain-specific languages. The book helps put into perspective the domains of Mathematics and Functional Programming and shows how Computer Science and Mathematics are usefully taught together. Generic Tools, Specific Languages (GTSL) is an approach for developing tools and applications in a way that supports easier and more meaningful adaptation to specific domains. To achieve this goal, GTSL generalizes programming language IDEs to domains traditionally not addressed by languages and IDEs. At its core, GTSL represents applications as documents/programs/models expressed with suitable languages. Application functionality is provided through an IDE that is aware of the languages and their semantics. The IDE provides editing support, and also directly integrates domain-specific analyses and execution services. Applications and their languages can be adapted to increasingly specific domains using language engineering; this includes developing incremental extensions to existing languages or creating additional, tightly integrated languages. Language workbenches act as the foundation on which such applications are built. mbeddr is an extensible set of integrated languages for embedded software development built using the Generic Tools, Specific Languages approach. A guide to language implementation covers such topics as data readers, model-driven code generators, source-to-source translators, and source analyzers. The classic book on the development of human language by the world’s leading expert on language and the mind. In this classic, the world's expert on language and mind lucidly explains everything you always wanted to know about language: how it works, how children learn it, how it changes, how the brain computes it, and how it evolved. With deft use of examples of humor and wordplay, Steven Pinker weaves our vast knowledge of language into a compelling story: language is a human instinct, wired into our brains by evolution. The Language Instinct received the William James Book Prize from the American Psychological Association and the Public Interest Award from the Linguistics Society of America. This edition includes an update on advances in the science of language since The Language Instinct was first published. A masterpiece of linguistics scholarship, at once erudite and entertaining, confronts the thorny question of how—and whether—culture shapes language and language, culture Linguistics has long shied away from claiming any link between a language and the culture of its speakers: too much simplistic (even bigoted) chatter about the romance of Italian and the goose-stepping orderliness of German has made serious thinkers wary of the entire subject. But now, acclaimed linguist Guy Deutscher has dared to reopen the issue. Can culture influence language—and vice versa? Can different languages lead their speakers to different thoughts? Could our experience of the world depend on whether our language has a word for "blue"? Challenging the consensus that the fundaments of language are hard-wired in our genes and thus universal, Deutscher argues that the answer to all these questions is—yes. In thrilling fashion, he takes us from Homer to Darwin, from Yale to the Amazon, from how to name the rainbow to why Russian water—a "she"—becomes a "he" once you dip a tea bag into her, demonstrating that language does in fact reflect culture in ways that are anything but trivial. Audacious, delightful, and field-changing, Through the Language Glass is a classic of intellectual discovery. This volume investigates the linguistic development of children with regard to their knowledge of the verb and its grammar. The selection of papers brings to researchers and in particular psycholinguists empirical evidence from a wide variety of languages from Hebrew, through English to Estonian. The authors interpret their findings with a focus on cross-linguistic similarities and differences, without subscribing to either a UG-based or usage-based approach. This book presents twelve papers on the use of Languages for Specific Purposes (LSPs) throughout history. From Antiquity to the present time, contributors analyse how LSPs emerged both in Europe and in other parts of the world, such as Judea, North America, and China. The historical aspect of LSPs has generally not been studied in depth, despite being part of the global understanding of the phenomenon. All aspects of professional life are tackled in this book, including administration, commerce, diplomacy, medicine, legal studies, geography, sociology, mathematics and history. This volume will naturally appeal to historians but also to linguists, sociologists, and anyone interested in languages used in a professional context. It offers a better understanding of where LSPs come from, how they emerged and how they tend to become real specialties in the teaching of modern languages. This book constitutes the refereed proceedings of the 4th International Conference on Simulation, Modeling, and Programming for Autonomous Robots, SIMPAR 2014, held in Bergamo, Italy, in October 2014. The 49 revised full papers presented were carefully reviewed and selected from 62 submissions. The papers are organized in topical sections on simulation, modeling, programming, architectures, methods and tools, and systems and applications. Your success—and sanity—are closer at hand when you work at a higher level of abstraction, allowing your attention to be on the business problem rather than the details of the programming platform. Domain Specific Languages—"little languages" implemented on top of conventional programming languages—give you a way to do this because they model the domain of your business problem. DSLs in Action introduces the concepts and definitions a developer needs to build high-quality domain specific languages. It provides a solid foundation to the usage as well as implementation aspects of a DSL, focusing on the necessity of

applications speaking the language of the domain. After reading this book, a programmer will be able to design APIs that make better domain models. For experienced developers, the book addresses the intricacies of domain language design without the pain of writing parsers by hand. The book discusses DSL usage and implementations in the real world based on a suite of JVM languages like Java, Ruby, Scala, and Groovy. It contains code snippets that implement real world DSL designs and discusses the pros and cons of each implementation. Purchase of the print book comes with an offer of a free PDF, ePub, and Kindle eBook from Manning. Also available is all code from the book. What's Inside Tested, real-world examples How to find the right level of abstraction Using language features to build internal DSLs Designing parser/combinator-based little languages Gain an accelerated introduction to domain-specific languages in R, including coverage of regular expressions. This compact, in-depth book shows you how DSLs are programming languages specialized for a particular purpose, as opposed to general purpose programming languages. Along the way, you'll learn to specify tasks you want to do in a precise way and achieve programming goals within a domain-specific context. Domain-Specific Languages in R includes examples of DSLs including large data sets or matrix multiplication; pattern matching DSLs for application in computer vision; and DSLs for continuous time Markov chains and their applications in data science. After reading and using this book, you'll understand how to write DSLs in R and have skills you can extrapolate to other programming languages. What You'll Learn Program with domain-specific languages using R Discover the components of DSLs Carry out large matrix expressions and multiplications Implement metaprogramming with DSLs Parse and manipulate expressions Who This Book Is For Those with prior programming experience. R knowledge is helpful but not required. The language experience of children developing in linguistically diverse environments is subject to considerable variation both in terms of quantity and quality of language exposure. It is an open question how to investigate language exposure patterns and more important which factors are relevant for successful language learning. For example, children acquiring a minority language, including a signed language, are exposed to less variety of input than children acquiring a more global language. This is because they are living in a smaller linguistic community and with fewer occasions to use the language in everyday life. Despite this reduced input, most native signers are successful language learners. In contrast native language competence is not always achieved in signing deaf children with hearing parents or those with cochlear implants learning a spoken language. A similar outcome but with very different reasons has also been reported for hearing children with language impairment. In these populations acquisition of morphosyntactic aspects is developing atypically ending with an uncomplete linguistic repertoire. The circumstances of exposure during language development tend to differ in significant ways with respect to a large number of factors, such as, (i) length, quality and quantity of input, (ii) social status and attitudes toward the language, (iii) cognitive abilities required for language learning, and (iv) age of first exposure. Having early exposure to a range of different speakers is important in the acquisition of any language and may affect language proficiency. However, negative societal attitudes or a cognitive based disadvantage may create an unfavourable learning environment that prevents language learning from surfacing typically. This situation inevitably generates a different type of exposure for the child and consequently different language competence. In this Research Topic we intend to encourage the debate on social, linguistic and cognitive factors at play for designing an effective environment for language acquisition aiming at integrating linguistic variables coming from theoretical studies on language with environmental variables, such as, measures of language input or cognitive abilities on functions ancillary to language development. Children with specific language impairment (SLI) show a significant deficit in spoken language that cannot be attributed to neurological damage, hearing impairment, or intellectual disability. More prevalent than autism and at least as prevalent as dyslexia, SLI affects approximately seven percent of all children; it is longstanding, with adverse effects on academic, social, and (eventually) economic standing. The first edition of this work established Children with Specific Language Impairment as the landmark reference on this condition, considering not only the disorder's history, possible origins, and treatment but also what SLI might tell us about language organization and development in general. This second edition offers a complete update of the earlier volume. Much of the second edition is completely new, reflecting findings and interpretations based on the hundreds of studies that have appeared since the publication of the first edition in 1997. Topics include linguistic details (descriptive and theoretical), word and sentence processing findings, genetics, neurobiology, treatment, and comparisons to such conditions as autism spectrum disorders, ADHD, and dyslexia. The book covers SLI in children who speak a wide range of languages, and, although the emphasis is on children, it also includes studies of adults who were diagnosed with SLI as children or are the parents of children with SLI. Written by a leading scholar in the field, Children with Specific Language Impairment offers the most comprehensive, balanced, and unified treatment of SLI available. This book is intended as a systemic functional contribution to language typology both for those who would like to understand and describe particular languages against the background of generalizations about a wide range of languages and also for those who would like to develop typological accounts that are based on and embody descriptions of the systems of particular languages (rather than isolated constructions). The book is a unique contribution in at least two respects. On the one hand, it is the first book based on systemic functional theory that is specifically concerned with language typology. On the other hand, the book combines the particular with the general in the description of languages: it presents comparable sketches of particular languages while at the same time identifying generalizations based on the languages described here as well as on other languages. The volume explores eight languages, covering seven language families: French, German, Pitjantjatjara, Tagalog, Telugu, Vietnamese, Chinese, and Japanese. Testing language for specific purposes (LSP) refers to that branch of language testing in which the test content and test methods are derived from an analysis of a specific language use situation, such as Spanish for business, Japanese for tour guides, Italian for language teachers, or English for air traffic control. LSP tests are usually contrasted with general purpose language tests, in which purpose is more broadly defined, as in the Test of English as a Foreign Language. This book is the first to examine the issues surrounding the implementation of tests for specific purposes. It includes an in-depth discussion of the issues, an examination of the current exams, and a comprehensive overview of the literature. It will be a welcome addition to any language teaching professionals library. The definitive resource on domain-specific languages: based on years of real-world experience, relying on modern language workbenches and full of examples. Domain-Specific Languages are programming languages specialized for a particular application domain. By incorporating knowledge about that domain, DSLs can lead to more concise and more analyzable programs, better code quality and increased development speed. This book provides a thorough introduction to DSL, relying on today's state of the art language workbenches. The book has four parts: introduction, DSL design, DSL implementation as well as the role of DSLs in various aspects of software engineering. Part I Introduction: This part introduces DSLs in general and discusses their advantages and drawbacks. It also defines important terms and concepts and introduces the case studies used in the most of the remainder of the book. Part II DSL Design: This part discusses the design of DSLs - independent of implementation techniques. It reviews seven design dimensions, explains a number of reusable language paradigms and points out a number of process-related issues. Part III DSL Implementation: This part provides details about the implementation of DSLs with lots of code. It uses three state-of-the-art but quite different language workbenches: JetBrains MPS, Eclipse Xtext and TU Delft's Spoofax. Part IV DSLs and Software Engineering: This part discusses the use of DSLs for requirements, architecture, implementation and product line engineering, as well as their roles as a developer utility and for implementing business logic. The book is available as a printed version (the one your are looking at) and as a PDF. For details see the book's companion website at http: //dslbook.org Dijkstra once wrote that computer science is no more about computers than astronomy is about telescopes. Despite the many incredible advances in c- puter science from times that predate practical mechanical computing, there is still a myriad of fundamental questions in understanding the interface between computers and the rest of the world. Why is it still hard to mechanize many tasks that seem to be fundamentally routine, even as we see ever-increasing - pacity for raw mechanical computing? The disciplined study of domain-speci?c languages (DSLs) is an emerging area in computer science, and is one which has the potential to revolutionize the ?eld, and bring us closer to answering this question. DSLs are formalisms that have four general characteristics. – They relate to a well-de?ned domain of discourse, be it controlling tra?c lights or space ships. – They have well-de?ned notation, such as the ones that exist for prescribing music, dance routines, or strategy in a football game. – The informal or intuitive meaning of the notation is clear. This can easily be overlooked, especially since intuitive meaning can be expressed by many di?erent notations that may be received very di?erently by users. – The formal meaning is clear and mechanizable, as is, hopefully, the case for the instructions we give to our bank or to a merchant online. This book is intended to help language teachers to work effectively and successfully with students who have Specific Learning Differences (SpLDs). It enables teachers to gain a thorough understanding of the nature of SpLDs and how these affect both general learning processes and the mechanisms of second language acquisition. In addition, the book explores the particular inclusive methods and techniques of teaching and assessment that foster success in language learning. Language teaching is embedded in a wider social and educational context, and therefore the book also provides an in-depth discussion of general educational issues related to identifying and disclosing disabilities and to making transitions from one institution to the other. The content has been thoroughly updated and revised for the second edition, particularly in the areas of inclusive pedagogies, new evidence-based methods and tools for identifying SpLDs, and new conceptualisations of neurodiversity. The book also includes the latest research on assessment, transition and progression, and the impact of SpLDs on additional language learning. Extend and enhance your Java applications with domain-specific scripting in Groovy About This Book Build domain-specific mini languages in Groovy that integrate seamlessly with your

Java apps with this hands-on guide Increase stakeholder participation in the development process with domain-specific scripting in Groovy Get up to speed with the newest features in Groovy using this second edition and integrate Groovy-based DSLs into your existing Java applications. Who This Book Is For This book is for Java software developers who have an interest in building domain scripting into their Java applications. No knowledge of Groovy is required, although it will be helpful. This book does not teach Groovy, but quickly introduces the basic ideas of Groovy. An experienced Java developer should have no problems with these and move quickly on to the more involved aspects of creating DSLs with Groovy. No experience of creating a DSL is required. What You Will Learn Familiarize yourself with Groovy scripting and work with Groovy closures Use the meta-programming features in Groovy to build mini languages Employ Groovy mark-up and builders to simplify application development Familiarize yourself with Groovy mark-up and build your own Groovy builders Build effective DSLs with operator overloading, command chains, builders, and a host of other Groovy language features Integrate Groovy with your Java and JVM based applications In Detail The times when developing on the JVM meant you were a Java programmer have long passed. The JVM is now firmly established as a polyglot development environment with many projects opting for alternative development languages to Java such as Groovy, Scala, Clojure, and JRuby. In this pantheon of development languages, Groovy stands out for its excellent DSL enabling features which allows it to be manipulated to produce mini languages that are tailored to a project's needs. A comprehensive tutorial on designing and developing mini Groovy based Domain Specific Languages, this book will guide you through the development of several mini DSLs that will help you gain all the skills needed to develop your own Groovy based DSLs with confidence and ease. Starting with the bare basics, this book will focus on how Groovy can be used to construct domain specific mini languages, and will go through the more complex meta-programming features of Groovy, including using the Abstract Syntax Tree (AST). Practical examples are used throughout this book to de-mystify these seemingly complex language features and to show how they can be used to create simple and elegant DSLs. Packed with examples, including several fully worked DSLs, this book will serve as a springboard for developing your own DSLs. Style and approach This book is a hands-on guide that will walk you through examples for building DSLs with Groovy rather than just talking about "metaprogramming with Groovy". The examples in this book have been designed to help you gain a good working knowledge of the techniques involved and apply these to producing your own Groovy based DSLs. In this final volume in the series, the contributors attempt to "expand the contexts" in which child language has been examined crosslinguistically. The chapters build on themes that have been touched on, anticipated, and promised in earlier volumes in the series. The study of child language has been situated in the disciplines of psychology and linguistics, and has been most responsive to dominant issues in those fields such as nativism and learning, comprehension and production, errors, input, and universals of morphology and syntax. The context has primarily been that of the individual child, interacting with a parent, and deciphering the linguistic code. The code has been generally treated in these volumes as a system of morphology and syntax, with little attention to phonology and prosody. Attention has been paid occasionally to the facts that the child is acquiring language in a sociocultural setting and that language is used in contexts of semantic and pragmatic communication. In addition, there has been a degree of attention paid to the interactions between language and cognition in the process of development. As for individual differences between children, they have been discussed in those studies where they could not be avoided, but such variation has rarely been the focus of systematic attention. Differences between individual languages have been of great interest, but these differences have not often been placed in a framework of systematic typological variation. And although languages and their grammars change over time, the focus of attention on the individual child learner has generally led to neglect of explanatory principles that are best found on the level of linguistic diachrony, rather than the level of innate ideas or patterns of learning and cognition in the individual child. The chapter authors seek to explore these neglected contexts in more depth. This book covers several topics related to domain-specific language (DSL) engineering in general and how they can be handled by means of the JetBrains Meta Programming System (MPS), an open source language workbench developed by JetBrains over the last 15 years. The book begins with an overview of the domain of language workbenches, which provides perspectives and motivations underpinning the creation of MPS. Moreover, technical details of the language underneath MPS together with the definition of the tool’s main features are discussed. The remaining ten chapters are then organized in three parts, each dedicated to a specific aspect of the topic. Part I “MPS in Industrial Applications” deals with the challenges and inadequacies of general-purpose languages used in companies, as opposed to the reasons why DSLs are essential, together with their benefits and efficiency, and summarizes lessons learnt by using MPS. Part II about “MPS in Research Projects” covers the benefits of text-based languages, the design and development of gamification applications, and research fields with generally low expertise in language engineering. Eventually, Part III focuses on “Teaching and Learning with MPS” by discussing the organization of both commercial and academic courses on MPS. MPS is used to implement languages for real-world use. Its distinguishing feature is projectional editing, which supports practically unlimited language extension and composition possibilities as well as a flexible mix of a wide range of textual, tabular, mathematical and graphical notations. The number and diversity of the presented use-cases demonstrate the strength and malleability of the DSLs defined using MPS. The selected contributions represent the current state of the art and practice in using JetBrains MPS to implement languages for real-world applications. 2nd International Workshop on Real World Domain Specific Languages Feb 04, 2017-Feb 04, 2017 Austin, USA. You can view more information about this proceeding and all of ACM•s other published conference proceedings from the ACM Digital Library: http://www.acm.org/dl. This series of HANDBOOKS OF LINGUISTICS AND COMMUNICATION SCIENCE is designed to illuminate a field which not only includes general linguistics and the study of linguistics as applied to specific languages, but also covers those more recent areas which have developed from the increasing body of research into the manifold forms of communicative action and interaction. For "classic" linguistics there appears to be a need for a review of the state of the art which will provide a reference base for the rapid advances in research undertaken from a variety of theoretical standpoints, while in the more recent branches of communication science the handbooks will give researchers both an verview and orientation. To attain these objectives, the series will aim for a standard comparable to that of the leading handbooks in other disciplines, and to this end will strive for comprehensiveness, theoretical explicitness, reliable documentation of data and findings, and up-to-date methodology. The editors, both of the series and of the individual volumes, and the individual contributors, are committed to this aim. The languages of publication are English, German, and French. The main aim of the series is to provide an appropriate account of the state of the art in the various areas of linguistics and communication science covered by each of the various handbooks; however no inflexible pre-set limits will be imposed on the scope of each volume. The series is open-ended, and can thus take account of further developments in the field. This conception, coupled with the necessity of allowing adequate time for each volume to be prepared with the necessary care, means that there is no set time-table for the publication of the whole series. Each volume will be a self-contained work, complete in itself. The order in which the handbooks are published does not imply any rank ordering, but is determined by the way in which the series is organized; the editor of the whole series enlist a competent editor for each individual volume. Once the principal editor for a volume has been found, he or she then has a completely free hand in the choice of co-editors and contributors. The editors plan each volume independently of the others, being governed only by general formal principles. The series editor only intervene where questions of delineation between individual volumes are concerned. It is felt that this (modus operandi) is best suited to achieving the objectives of the series, namely to give a competent account of the present state of knowledge and of the perception of the problems in the area covered by each volume. Language ability is not only universal, but of vast potential, and related to numerous other cognitive and social functions. This book explores individual language process development and how it proceeds in a very predictable manner, parallel to specific areas of brain development. The authors' acquaint the reader with the current debate on the prevalence of oral and written linguistic difficulties as a precursor of Specific Learning Difficulties (SLD). The difficulties in verb/action processing found in patients with Parkinson's disease are discussed as well. The inferential abilities of children with Specific Language Impairments (SLI) are also reviewed. Traumatic brain injury (TBI) and its effects on communication are explored in Chapter 6. The authors' findings suggest that communication difficulty persist for years after injury, independent from other cognitive abilities. In later chapters, the authors examine atypical language development and psychopathological risk. The remaining chapters review nonverbal behavior and its importance in objectifying and verifying the diagnosis of mental disorders, if any; the communication challenges for the deaf (and applications that can help impaired people in some aspects of their life); and finally, the importance of segmental duration -- a very important component of a text-to-speech (TTS) system in order to produce high quality synthetic speech which sounds natural. When carefully selected and used, Domain-Specific Languages (DSLs) may simplify complex code, promote effective communication with customers, improve productivity, and unclog development bottlenecks. In Domain-Specific Languages, noted software development expert Martin Fowler first provides the information software professionals need to decide if and when to utilize DSLs. Then, where DSLs prove suitable, Fowler presents effective techniques for building them, and guides software engineers in choosing the right approaches for their applications. This book’s techniques may be utilized with most modern object-oriented languages; the author provides numerous examples in Java and C#, as well as selected examples in Ruby. Wherever possible, chapters are organized to be self-standing, and most reference topics are presented in a familiar patterns format. Armed with this wide-ranging book, developers will have the knowledge they need to make important decisions about DSLs—and, where appropriate, gain the significant technical and business benefits they offer. The

topics covered include: How DSLs compare to frameworks and libraries, and when those alternatives are sufficient Using parsers and parser generators, and parsing external DSLs Understanding, comparing, and choosing DSL language constructs Determining whether to use code generation, and comparing code generation strategies Previewing new language workbench tools for creating DSLs Enhance your existing Clojure know-how with this example-packed tutorial on building custom languages. It will help you unlock the potential of Clojure in a way you probably never thought possible. Explore DSL concepts from existing Clojure DSLs and libraries Bring Clojure into your Java applications as Clojure can be hosted on a Java platform A tutorial-based guide to develop custom domain-specific languages In Detail Clojure is a very new and rapidly growing language that runs on top of the JVM. The language being hosted on the Java platform allows for Clojure applications to use existing Java components. Although there are objects in Clojure, the language is not object oriented. "Clojure for Domain-specific Languages" is an example-oriented guide to building custom languages. Many of the core components of Clojure are covered to help you understand your options when making a domain-specific language. By the end of this book, you should be able to make an internal DSL. Starting with a comparison of existing DSLs, this book will move on to guide you through general programming, Clojure editing, and project management. The chapters after that are code oriented. "Clojure for Domain-specific Languages" tries to expose you to as much Clojure code as possible. Many of the examples are executed in a Read-Evaluate-Print-Loop environment, so the reader can also follow along on their own machine. This book uses Leiningen, but no prior knowledge of it is required. "Clojure for Domain-Specific Languages" aims to make you familiar with the Clojure language and help you learn the tools to make your own language. 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.This book is for programmers who want to learn about Xtext and how to use it to implement a DSL (or a programming language) together with Eclipse IDE tooling. It assumes that the user is familiar with Eclipse and its functionality. Existing basic knowledge of a compiler implementation would be useful, though not strictly required, since the book will explain all the stages of the development of a DSL.