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# Programming Ecto

Build Database Apps in Elixir for Scalability and Performance

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for Scalability and Performance



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# Introduction

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For as long as there have been databases, there have been programmers writing libraries to access those databases in a more friendly way.

Which is a nice way of saying that they've been trying to avoid writing SQL.

SQL is powerful—there's a reason it's stuck around as long as it has—but generating it manually is tedious and error-prone. Developers have addressed this problem by creating libraries that wrap up the low-level vagaries of talking to a database into an API that's more harmonious with the language being used. In Java, we had Hibernate. In Python, SQLAlchemy. In Ruby, ActiveRecord and DataMapper. And now in Elixir, we have Ecto.

Ecto is a large library, and even with its excellent documentation, it can be hard to know where to start. This book will help you with that. Just as it's helpful to have a tour guide when visiting a new city, this book will help you find your way through Ecto. We'll take you through what we believe is the optimal path for learning the major components, and along the way you'll get expert advice and insight from one of Ecto's creators. At the end, you'll have a solid working knowledge of Ecto and you'll be ready to start integrating it into your own projects.

## Who This Book Is For

This book is for developers who want to access relational databases from their Elixir applications. This includes applications that use the Phoenix web development framework, but Ecto can work in any Elixir app, whether it uses Phoenix or not.

We're going to assume you have some basic knowledge of Elixir. You should be comfortable with creating and running Elixir applications, as well as the basic components of the language: modules, functions, pattern matching, working with the pipe operator, and so on. If you're brand new to the language, you might want to get some experience under your belt before diving into Ecto. [Programming Elixir ≥ 1.6 \[Tho18\]](#) is a great place to start.

We're also going to assume that you're comfortable working with relational databases and SQL. You don't need to be an expert, but you should be familiar with tables, columns, indexes, and how to write queries. Many online tutorials are available that can teach you the basics.

## What's In This Book

The book is divided into two parts. The first part will walk you through the main modules that form the core of Ecto's functionality. The second part will build on that knowledge and apply it to real-world use cases that often come up with database programming.

Throughout both parts, you'll be practicing what you learn by working on a sample app that's included with the book. We'll talk more about that in [Chapter 1, Getting Started with Repo, on page ?](#).

### Part I - Ecto Fundamentals

Part I is a tour of Ecto's API. We'll start at the ground level with the most basic features that Ecto provides, then work our way up, module-by-module, through all of the core features of the library. You'll be writing code every step of the way to help get Ecto into your fingers. At the end of Part I, you'll have a solid understanding of the API, and experience using it in working code.

### Part II - Ecto Applied

Part II will take the knowledge you picked up in Part I and put it to work. Each chapter covers a specific task or use case that you're likely to run into as you start integrating Ecto into your projects. You'll learn things like integrating Ecto with Phoenix, running tests asynchronously, working with custom types, streaming large datasets, and the like.

## How To Read This Book

You should start by reading Part I in order, from start to finish. Part I covers the most important features of Ecto and each chapter builds on the one before. Even if you've done some work with Ecto before, it's best not to skip around too much, as you might miss out on some key features you weren't aware of.

Part II is much less strict. You can read the chapters in any order, and you should feel free to focus your attention on the topics that are most interesting to you, and leave the rest for another time.

## Online Resources

You can download all the example source code for the book from the Pragmatic Bookshelf website for this book.<sup>1</sup> You can also provide feedback by submitting errata entries.

If you're reading the book in PDF form, you can click the link above a code listing to view or download the specific examples.

Ready to dive in? Open a terminal window and your favorite editor, and let's get started.

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1. <https://pragprog.com/book/wmecto/programming-ecto>