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Modern Asynchronous JavaScript

Tackle Complex Async Tasks with Less Code

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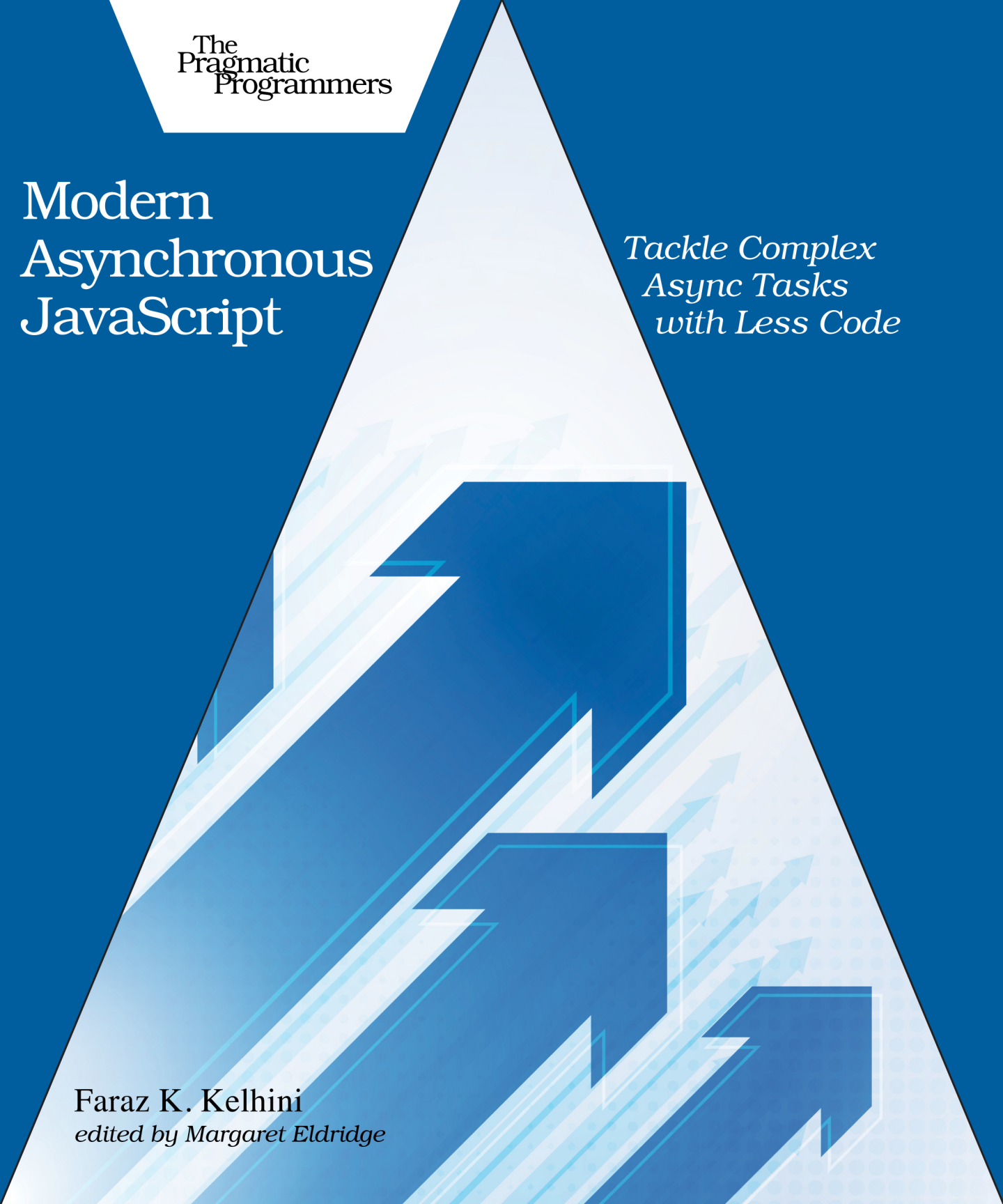

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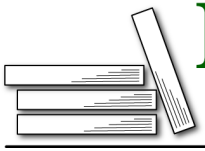

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Preface

Modern applications increasingly rely on asynchronous programming to perform multiple tasks at the same time, and JavaScript is quickly evolving to address this need. Many new features of JavaScript are designed to only work asynchronously. As a result, gaining the knowledge to perform async tasks effectively is a must for today's JavaScript programmers.

Designing responsive asynchronous programs might be challenging at first, but once you get the hang of it, the outcome is rewarding. This book is here to help you with that. You'll find multiple examples to help you write advanced programs using the new capabilities of JavaScript introduced in ES2020, ES2021, and ESNext. You'll also discover various techniques to manage and coordinate the asynchronous parts of your code efficiently.

Make sure you actually type and execute the code examples as you follow along in the book. Some examples may appear simple, but there's a big difference between reading the code and being able to write it on your own.

Who Is This Book For?

If you're an intermediate to advanced JavaScript programmer or web developer, this book is for you. We'll focus squarely on the practical aspects of asynchronous programming—that is, what each technique is designed to accomplish and how to use it in your program. If you've been using third-party libraries to manage asynchronous code and now want to switch to native JavaScript APIs, you'll benefit from this guide.

What You Should Know

To use this book, you should already know JavaScript and HTML. Use of HTML will be infrequent and fairly basic, and I'll explain each JavaScript example in detail. So even if your JavaScript or HTML is rusty, you'll be able to understand how the code is working.

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What's in This Book?

Modern Asynchronous JavaScript is deliberately succinct. You won't learn everything about asynchronous programming so that you can quickly pick up key tips and tricks. In each chapter, we'll dive straight into a different topic, so feel free to jump to any chapter in the book you want.

Chapter 1 shows you how to define or customize the iteration behavior of JavaScript objects using custom iterators.

Chapter 2 is where you learn to use a generator function as a shortcut to create iterators. Generators are useful when you don't need to manipulate the state-maintaining behavior of an iterator.

Chapter 3 introduces the `Promise.allSettled()` method and compares it to its older sibling `Promise.all()`. You'll use `Promise.allSettled()` to execute multiple async tasks simultaneously and process the outcome even if some of them fail.

Chapter 4 gives you tips to protect your app against server downtime while improving its performance with `Promise.any()` from ES2021.

Chapter 5 explains how to use the `Promise.race()` method to set a time limit for async tasks to avoid entering a state of prolonged or endless waiting.

Chapter 6 is all about the AbortController API. You'll learn to use this API to cancel pending async requests when the user clicks a cancel button.

Chapter 7 covers top-level `await` and how to make use of it to initialize resources, define dependency paths dynamically, and load dependencies with a fallback implementation.

Online Resources

To download the example code used in the book, please visit the Pragmatic Bookshelf website.[1] You can submit feedback and errata entries, get up-to-date information, and join in the discussions on the book's forum page. If you're reading the book in PDF format, you can view or download a specific example by clicking on the little gray box above the code.

Next up is the Introduction. If you're an experienced JavaScript programmer, most of the concepts in the Introduction will be familiar, whereas if you're more intermediate, you might find the discussion of callbacks and promises helpful.

1. https://www.pragprog.com/titles/fkajs