



# Swift Data Structure and Algorithms

*Erik Azar, Mario Eguiluz Alebicto*

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**Master the most common algorithms and data structures, and learn how to implement them efficiently using the most up-to-date features of Swift 3**

## About This Book

- Develop a deep understanding of the collections in the Swift Standard Library with this step-by-step guide
- Develop native Swift data structures and algorithms for use in mobile, desktop, and server-based applications
- Learn about performance efficiency between different data structures and algorithms

## Who This Book Is For

This book is for developers who want to learn how to implement and use common data structures and algorithms natively in Swift. Whether you are a self-taught developer without a formal technical background or you have a degree in Computer Science, this book will provide with the knowledge you need to develop advanced data structures and algorithms in Swift using the latest language features.

## What You Will Learn

- Get to know about the basic data structures and how to use the Swift REPL
- Use the Swift Standard Library collections bridging to Objective-C collections, and find out about protocol-oriented programming
- Find out about Swift generators and sequences, and see how to use them to implement advanced data structures such as Stack, StackList, Queue, and LinkedList
- Implement sorting algorithms such as Insertion Sort, Merge Sort, and Quick Sort and understand the performance trade-offs between them
- See how to implement various binary trees, B-Tree, and Splay Trees
- Perform advanced searching methods using Red-Black trees, AVL trees, and Trie trees, and take a look at several substring search algorithms
- Get to know about the data structures used in graphs and how to implement graphs such as depth-first search, breadth-first search, directed graphs, spanning tree, and shortest path
- Explore algorithm efficiency and see how to measure it

## In Detail

Apple's Swift language has expressive features that are familiar to those working with modern functional languages, but also provides backward support for Objective-C and Apple's legacy frameworks. These features are attracting many new developers to start creating applications for OS X and iOS using Swift.

Designing an application to scale while processing large amounts of data or provide fast and efficient searching can be complex, especially running on mobile devices with limited memory and bandwidth.

Learning about best practices and knowing how to select the best data structure and algorithm in Swift is crucial to the success of your application and will help ensure your application is a success. That's what this book will teach you.

Starting at the beginning, this book will cover the basic data structures and Swift types, and introduce asymptotic analysis. You'll learn about the standard library collections and bridging between Swift and Objective-C collections. You will see how to implement advanced data structures, sort algorithms, work with trees, advanced searching methods, use graphs, and performance and algorithm efficiency. You'll also see how to choose the perfect algorithm for your problem.

## Style and approach

This easy-to-follow yet comprehensive guide can either be read from beginning to end, or depending on your current knowledge level, you can jump to the specific chapter that interests you. Each chapter topic starts with an introduction to the topic and algorithm before moving on to the hands-on implementation and analysis.

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