



FOURTH EDITION



Professional

Android[®]

Reto Meier and Ian Lake

PROFESSIONAL ANDROID®, FOURTH EDITION

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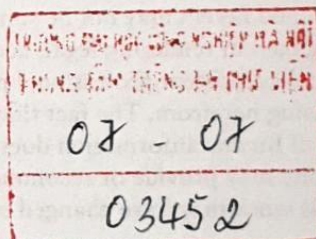
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Fourth Edition

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INTRODUCTION

For many people, smartphones have become an extension of themselves. Now running on over 2 billion monthly-active devices, Android is the most common smartphone operating system in use world-wide, with users installing an average of 50 apps each, resulting in over 94 billion apps downloaded from the Play app store in 2017 alone.

Ubiquitous and indispensable, smartphones are so advanced and personal that studies have shown people become anxious if they misplace their device, lose connectivity, or run low on battery.

In the 10 years since launching in 2008, Android has expanded beyond mobile phones to become a development platform for a wide range of hardware, with 24,000 devices from over 1,300 brands, including everything from tablets to televisions, watches, cars, and Internet of Things (IoT) devices. Over the same period, there have been 28 platform and SDK releases.

These innovations, combined with the size of the ecosystem, provide unparalleled opportunities for developers to create innovative new applications for a global audience of users.

Android offers an open platform for mobile application development. Without artificial barriers, Android developers are free to write apps that take full advantage of an incredible range of devices. Using Google Play for distribution, developers can distribute free and paid applications to compatible Android devices globally.

This book is a hands-on guide to building Android applications for all Android devices. It's written based on version 8.1 of the Android SDK, using Android Studio 3.1. Chapter by chapter, it takes you through a series of sample projects, each introducing new features and techniques to get the most out of Android. It covers all the basic functionality to get started, as well as the information for experienced mobile developers to take full advantage of the features of Android, to enhance existing products or create innovative new ones.

The Android team releases a new major platform every year, a new version of Android Studio every few months, and incremental changes to Jetpack, such as the support library and Android Architecture Components, many times each year. With such rapid release cycles, there are regular changes, additions, and improvements to the tools, platform APIs, and development libraries you'll use—and which are described in this book. To minimize the impact of these changes, the Android engineering team works hard to ensure backward compatibility.

However, future releases will date some of the information provided in this book, and not all active Android devices will be running the latest platform release. To mitigate this, wherever possible, we have used backward-compatible support libraries, and included details on which platform releases support the functionality described—and which alternatives may exist to provide support for users of devices running earlier platforms.

Further, the explanations and examples included will give you the grounding and knowledge needed to write compelling mobile applications using the current SDK, along with the flexibility to quickly adapt to future enhancements.

WHO THIS BOOK IS FOR

This book is for anyone interested in creating applications for the Android platform. It includes information that will be valuable, whether you're an experienced mobile developer on other platforms, making your first foray into writing mobile apps, and if you have some Android development experience.

It will help if you've used a smartphone (particularly an Android device), but it's not necessary, nor is prior experience in mobile application development.

It's expected that you'll have experience in software development and be familiar with basic object-oriented paradigms. An understanding of Java syntax is expected, though not a strict necessity.

Chapters 1 and 2 introduce mobile development and the Android development platform, and contain instructions to get you started. Beyond that, there's no requirement to read the chapters in order, although a good understanding of the core components described in Chapters 3–7 is important before you venture into the remaining chapters. Chapter 11 covers important details on how to ensure your apps are responsive and efficient, while Chapters 12–14 describe how to provide a rich and consistent user experience. The remaining chapters cover a variety of functionality whose relevance will vary based on your application, and can be read in whatever order interest or need dictates.

WHAT THIS BOOK COVERS

Chapter 1 introduces Android, including what it is and how it fits into the mobile development ecosystem. What Android offers as a development platform and why it's an exciting opportunity for creating mobile phone applications are then examined in greater detail.

Chapter 2 covers some best practices for mobile development and explains how to download and install Android Studio and the Android SDK. It then introduces some of the tools and features included with Android Studio, and demonstrates how they can be used to create and debug new applications.

Chapters 3–7 take an in-depth look at the fundamental Android application components—starting by examining the components that make up an Android application, and then moving on to “Activities” and “Fragments,” and their associated lifetimes and lifecycles.

You'll then be introduced to the application manifest and the Gradle build system, before learning more about the external resource framework used to support devices used in different countries, with different languages, and in a variety of shapes and sizes.

You'll learn how to create basic user interfaces with layouts, Views, and Fragments, before being introduced to the Intent and Broadcast Receiver mechanisms used to perform actions and send messages between application components. Accessing Internet resources is then covered, followed by a detailed look at data storage, retrieval, and sharing. You'll start with the preference-saving