Android Essentials with Kotlin

Course Overview

This seven-day course teaches development techniques and language principles for working with the Kotlin programming language to build new Android apps. In addition to learning basic principles for Android development, you will also learn how to migrate your existing Java Android apps to the new language.

Who should take this course

- Current Android developers who are interested in transitioning their projects to Kotlin.
- Developers of any language looking to become familiar with Android and explore the Kotlin language.
- Hobbyist developers looking to make the leap into professional Android app development.
- Developers who wish to see both object-oriented and functional programming paradigms implemented in a modern JVM language.

Syllabus

- Introduction
    - Meet the instructor and get familiar with the tools required to build programs

- Constants, Types and Variables
    - Understanding writable & read-only properties and an introduction to the basic type of the language

- Control Flow
    - Working with conditionals & control flow statements, and the additional support of control flow statements as assignable expressions

- Exceptions
    - Understand exceptions and how they may be handled safely

- Arrays and Collections
  - Learn how to represent series of data with Array, Mutable, List and Set

- Iteration
  - See how to work with data using for loops, while loops, break and continue

- Collection Types
  - Take a closer look at collections, including destructuring, type checking, smart casting, and type parameter constraints

- Functions
  - Learn about defining package and file level functions and specifying their return types

- Higher-Order Functions
  - Use the functional paradigms to clean up code, including map, flatMap, filter, and reduce, as well as how to define your own functional operators

- Classes
  - Working with object-oriented programming features

- Initialization
  - Learn about default and optional constructors, equality, and preconditions for object construction

- Representing Data with Objects
  - Learn how to use data classes and how to represent data statically

- Extension Functions
  - Understand the extension functions to safely addd behavior to classes you do not control

- Interoperability with Java
  - Learn how to interoperate with Java classes and support Java compatibility

- Reflection
  - Explore reflection features

- Extensions with Receivers
  - Use extensions with receivers to specify a domain-specific language

- Introduction to Android
  - Use Android Studio and the emulator.

- Android and Model-View-Controller
  - Create a simple Android Activity using basic view widgets.

- The Activity Lifecycle
  - Learn how Android deals with rotation and memory pressure, and create a special view for an application when the device is in landscape.

- Debugging Android Apps
  - Analyze stacktraces and use Android Studio to find and fix bugs in your application.

- Your Second Activity
  - Create a second activity and communicate between activities.

- Android SDK Versions and Compatibility
  - Learn how to support a variety of Android versions gracefully.

- UI Fragments and the Fragment Manager
  - Architect an Android app using fragments.

- Displaying Lists with RecyclerView
  - Use a RecyclerView with a custom layout to display a list of data

- Creating User Interfaces with Layouts and Widgets
  - Explore the Android measure and layout process while using the new ConstraintLayout tool.

- Using Fragment Arguments
  - Pass arguments to a fragment in a safe way.

- Using ViewPager
  - Swipe between fragments.

- Dialogs
  - Create and display a dialog with a custom view.

- The Toolbar
  - Use the AppCompat library to display and populate a Toolbar.

- SQLite Databases
  - Use a SQLite database to persist data.

- Implicit Intents
  - Open-ended wish fulfillment in Android.

- Taking Pictures with Intents
  - Use implicit intents to take and save a picture.

- Two-Pane Master-Detail Interfaces
  - Use fragments to create a responsive app optimized for phones and tablets.

- Localization
  - Update an application to support multiple languages while learning about the strengths and weaknesses of Android's localization framework.

- Accessibility
  - Improve an application's usability for a wider audience.

- Data Binding and MVVM
  - Use Android's new data binding tools as well as a model-view-viewmodel architecture to write elegant activities.

- Unit Testing and Audio Playback
  - Teach the tools to verify that your code functions as it should.

- Styles and Themes
  - Use the AppCompat library to bring material themes to an application.

- XML Drawables
  - Create shape, state-list and layer-list XML drawables.

- Intents and Tasks
  - Query the operating system to determine which activities can handle a certain action.

- HTTP & Background Tasks
    - Connect to the internet, use Flickr's REST API, parse JSON and move off the main thread with AsyncTask.

- Loopers, Handlers and HandlerThread
    - Learn about Android's main thread and download photos from Flickr.

- Search
    - Use a SearchView in the toolbar to search Flickr.

- Background Services
    - Work behind the scenes and use Android Notifications.

- Broadcast Intents
    - Subscribe to local and OS events.

- WebView
    - Use WebView to include web content.

- Custom Views and Touch Events
    - Perform custom drawing and manually interpret touch events.

- Property Animation
    - Animate views using property animations.

- Locations and Play Services
    - Use Google Play Services to determine the device's location.

- Maps
    - Google Maps API and map overlays.