
Learn to Develop Android Apps in Java

This course covers all the concepts of Android in detail from simple image rendering to complex cloud based applications. After completing this course the student will have the knowledge to start working on his own app idea and publish it to the play store. The student will also be in a position to dive deep into advanced Android.

Program Syllabus

1. Hello Android

A. Introduction to Android Studio

- Project file structure
 - /assets folder
 - /java folder
 - /res folder
 - What's in drawable folder
 - What's in layout folder
 - What's in mipmap folder
 - What's in values folder
 - Use of dimen.xml
 - Use of strings.xml
 - Use of colors.xml
 - /androidTest folder
 - /test folder
- What's in AndroidManifest.xml ?
 - What are user permissions and how to include them ?
 - What type of tag elements can be used ?
- What's build.gradle ?
 - App level build.gradle file
 - Project level build.gradle file
- Creating a Android Virtual Device (AVD)
- What is Android SDK Manager ?
 - What's in Android's Software Development Kit (SDK) ?

- The ADB shell commands
- Uses of Android Monitor
 - Checking network usages
 - Managing your app's memory
 - Using LogCat
 - Verbose
 - Debug
 - Info
 - Warn
 - Error
- Dalvik Debug Monitor Server (DDMS)
 - Android Device Monitor and its components
 - Using DDMS
 - Finding memory leaks in objects
 - Exploring device's file system
 - Eclipse Memory Analyzer (MAT)

B. Android User Interface Components

- What are Views in Android ?
 - Views included in the SDK package
 - TextView
 - EditText
 - Button
 - ImageView
 - View Attributes
 - Use of the ID attribute
 - The layout_ prefix
- What are ViewGroups in Android ?

- The xmlns:android namespace
- The xmlns:tools namespace
- The match_parent constant
- The wrap_content constant
- Layouts included in the SDK package
 - ConstraintLayout
 - What are constraints
 - Parent Positioning
 - Order Positioning
 - Baseline Alignment
 - Guideline
 - Creating a constraint layout chain
 - Spread
 - Spread Inside
 - Packed
 - Weighted
 - LinearLayout
 - Orientation
 - Layout Weight
 - RelativeLayout
 - Positioning Views
- Write the XML
- Theming and Styling
 - Applying theme to the entire app
 - Styling the UI using drawable
 - Selecting the desired parent theme for your app
 - Inheriting style from the parent

- Supporting different screen sizes
 - Density Independent Pixels (DP)
 - Scale Independent Pixels (SP)

C. Final Project

- Design and implement a simple app which shows text and image on the screen.



2. Android App components

A. The concept of Activities

- Configuring the AndroidManifest file
- Managing the activity lifecycle
 - The onCreate() callback
 - The onStart() callback
 - The onResume() callback
 - The onPause() callback
 - The onStop() callback
 - The onRestart() callback
 - The onDestroy() callback
 - Handling configuration changes
- The Intent message object
 - Opening another activity
 - Intent types
 - Implicit Intents
 - Explicit Intents
 - Building an Intent
 - Component name
 - Action
 - Category
 - Data
 - Pending Intent
 - With XML
- Passing data between activities
 - Using extras
 - Using Parcelable implementation

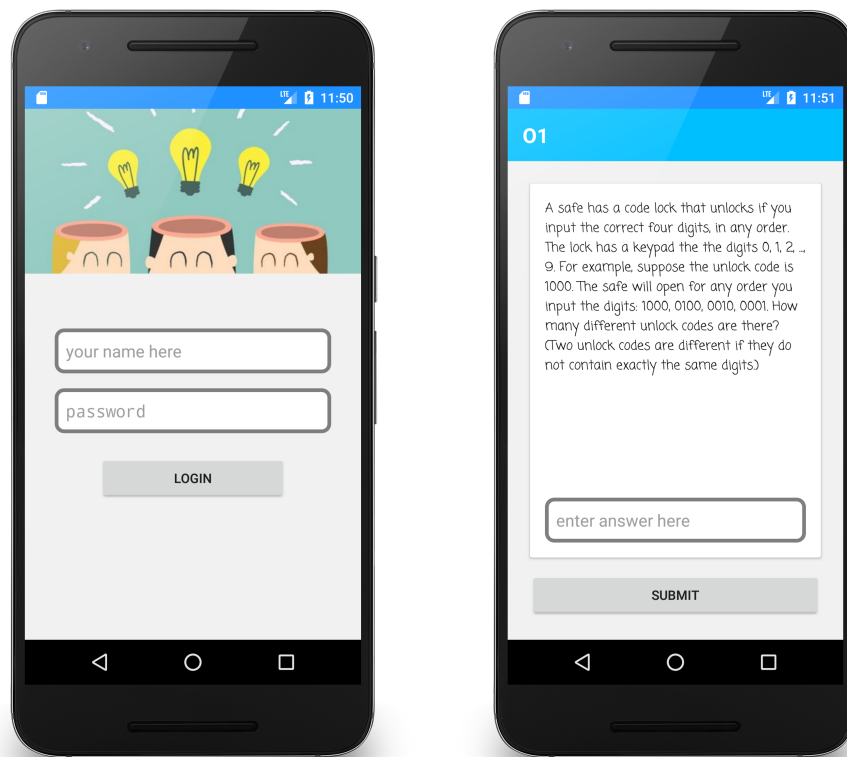
- Saving the activity's state
- Tasks and Back Stack
 - LIFO (last in first out) stack
 - Managing Tasks

B. What are Fragments ?

- Extending a fragment
- Lifecycle of a fragment
- Adding a fragment to an activity
 - With XML
 - With Fragment Transaction
- Communicating with Activity

C. Final Project

- Build an app to keep track of scores from various quiz questions.



3. Performing Network Operations

A. Creating Lists and Cards

- Creating Lists
 - What's RecyclerView ?
 - Use of LayoutManagers
 - Data binding using the RecyclerView.Adapter class
 - The ViewHolder pattern
- Creating Cards
 - Using the CardView class

B. Basics of Networking

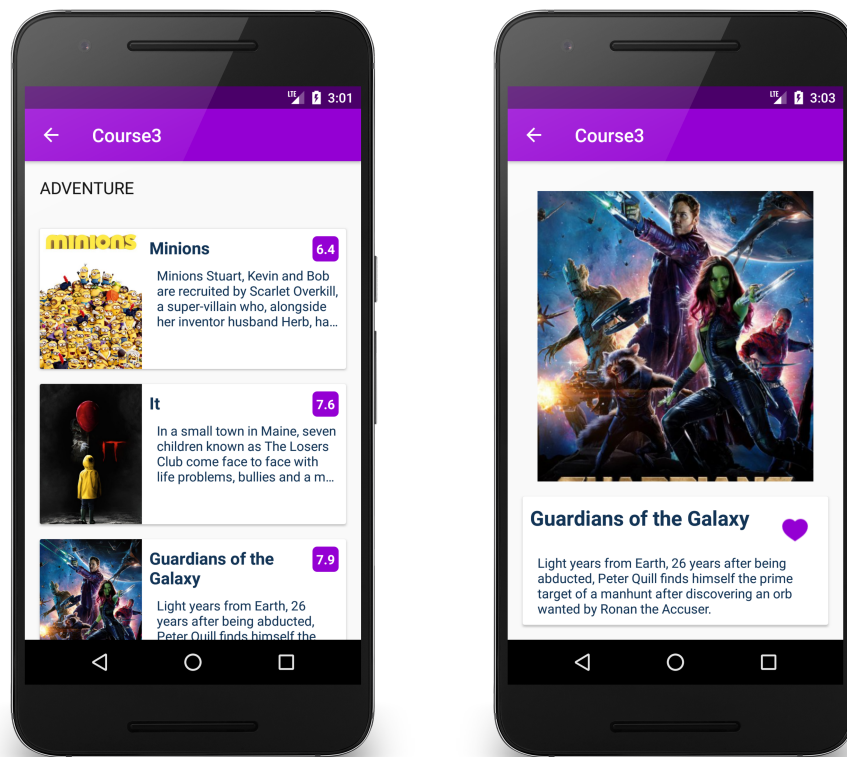
- The Client-Server model
 - What's a client ?
 - What's a server ?
- Basics of HTTP
 - The Hyper Text Transfer Protocol
 - The TCP/IP protocols
 - Methods in HTTP
 - GET
 - POST
 - PATCH
 - Javascript Object Notation (JSON) structure
 - Understanding JSON
 - Components of a URL
 - Scheme
 - Host
 - Path

C. Networking in Android

- Connecting to the Network
 - Concept of threading
 - Offloading work using AsyncTask
 - Communicating with callbacks
- The Modal View Presenter pattern
 - What is data Modal ?
 - Implementing presentation logic
 - Passing data from Presenter to Views
- Data parsing techniques
 - JSON parsing with GSON

D. Final Project

- Create an app to list favorite movies using the TMDb API.



4. Data Persistence and Broadcasting messages

A. Storage Options

- Shared Preferences
- Internal Storage
- External Storage
- SQLite Database
 - CRUD Basics
 - SELECT statement
 - WHERE clause
 - ORDER BY clause
 - GROUP BY clause
 - HAVING clause
 - SQLite in Action
 - Creating tables
 - Contract classes
 - Querying a database
 - Cursors
 - Content Provider
 - What is a Content Provider ?
 - Extending a Provider
 - Querying, Inserting, Updating, Deleting data from provider
 - Retrieving data from the Provider
 - CursorLoader
 - Exporting data to other apps
 - Permissions

B. Broadcasts

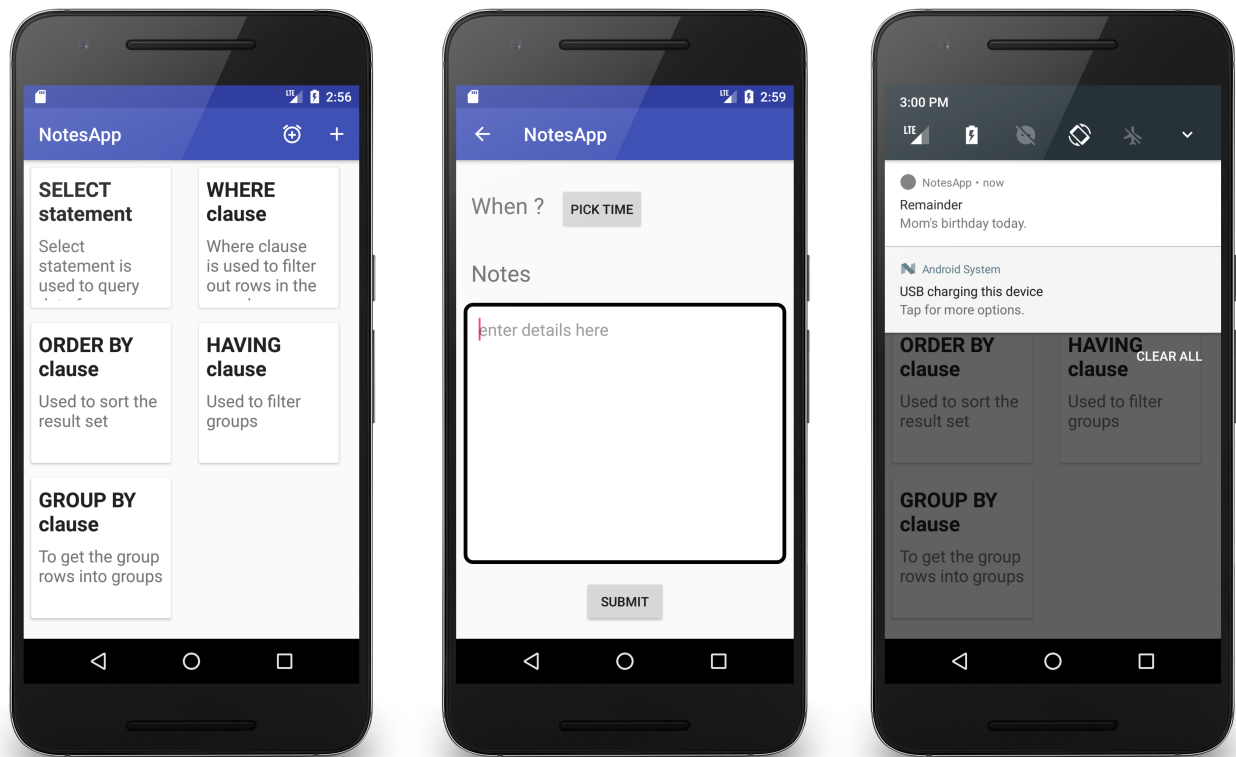
- Extending a BroadcastReceiver
 - Sending/Receiving Broadcasts
- Alarm Manager
 - Scheduling a Broadcast

C. App Notifications

- Creating a Notification
- Notification dots

D. Final Project

- Schedule and save reminders with the help of notes taking app.



5. Implement your own app

- A. Firebase Backend service for mobile apps
- B. Brainstorming ideas of students for developing own application.
- C. Design methodology
- D. Building an application
- E. Publishing to Google Play Store

Further Reading

1. Android Internals

Link: <https://www.youtube.com/watch?v=MlxiQNijniQ&list=PL03354C90699270BD>

2. Kotlin for Android

Book: Kotlin in Action by Dmitry Jemerov and Svetlana Isakova