3-Month Internship Program

(12 Weeks): Android Development Training

Week 1: Introduction to Android Development

- **Topics:**
  - Overview of Android platform and its architecture.
  - Setting up the Android development environment (Android Studio, SDK).
  - Understanding Android components: Activities, Services, Broadcast Receivers, Content Providers.
  - Introduction to Java and Kotlin programming languages.
- **Assignment:**
  - Install Android Studio and create a "Hello World" Android application.

Week 2: User Interface (UI) and Layouts

- **Topics:**
  - Android UI components: TextView, Button, EditText, ImageView.
  - Working with layouts: LinearLayout, RelativeLayout, ConstraintLayout.
  - Understanding UI design principles and best practices.
  - Introduction to Material Design and Android's design guidelines.
- **Assignment:**
  - Design and implement a simple login screen using different layouts.

Week 3: Working with Intents and Activities

- **Topics:**
  - Understanding intents: Explicit and implicit intents.
  - Starting new activities and passing data between activities using intents.
  - Activity lifecycle: onCreate, onStart, onResume, onPause, onStop, onDestroy.
  - Managing activity states and handling configuration changes.
- **Assignment:**
  - Create an app with multiple activities and implement data passing between them using intents.

Week 4: Android Views and Event Handling

- **Topics:**
  - Exploring various view components: ListView, RecyclerView, ScrollView, GridView.
  - Handling user events: onClick, onTouch, onLongClick, and gestures.
  - Adapter classes and binding data to views.
  - Implementing event listeners for user interactions.
- **Assignment:**
  - Create a simple app with a RecyclerView to display a list of items and handle user interactions.

Week 5: Storing Data in Android (SharedPreferences, SQLite, and Room Database)

- **Topics:**
  - Introduction to storing data in Android: SharedPreferences, internal and external storage.
  - Working with SQLite database in Android.
  - Introduction to Room database: setting up, creating entities, DAOs, and migrations.
  - Performing CRUD operations on SQLite and Room databases.
- **Assignment:**
  - Develop an app to store user preferences using SharedPreferences and perform CRUD operations using Room.

Week 6: Networking and APIs

- **Topics:**
  - Introduction to RESTful APIs and HTTP requests.
  - Working with JSON data and parsing it using Gson or Moshi.
  - Using Retrofit or Volley libraries for network operations.
  - Handling background tasks with AsyncTask, Retrofit, or Kotlin Coroutines.
- **Assignment:**
  - Create an app that fetches data from an API and displays it in a RecyclerView.

Week 7: Android Services and Background Tasks

- Topics:
  - Introduction to Android services: foreground and background services.
  - Working with background tasks using WorkManager, AsyncTask, and Services.
  - Scheduling tasks with AlarmManager and JobScheduler.
  - Understanding lifecycle and memory management for background tasks.
- Assignment:
  - Create an app that uses a background service to update data periodically.

Week 8: User Authentication and Firebase

- Topics:
  - Introduction to Firebase and its features for Android development.
  - Firebase Authentication: email/password login, social login (Google, Facebook).
  - Setting up Firebase in an Android project and managing users.
  - Firebase Realtime Database and Firestore for storing user data.
- Assignment:
  - Implement Firebase Authentication in an app, allowing users to log in with Google or Facebook.

Week 9: Multimedia and Camera Integration

- Topics:
  - Accessing device camera and media storage.
  - Capturing photos and videos using Camera API or CameraX.
  - Working with audio and video playback.
  - Understanding Android's permissions model for multimedia.
- Assignment:
  - Develop an app that allows users to take a photo and display it on the screen.

Week 10: Location Services and Maps

- **Topics:**
  - Introduction to location services in Android.
  - Using GPS and Google Maps SDK to track user location.
  - Displaying maps and markers on Android using Google Maps API.
  - Geofencing and location-based notifications.
- **Assignment:**
  - Create an app that shows the user's current location on a map and tracks movement.

Week 11: Publishing and Monetizing Android Apps

- **Topics:**
  - Preparing your app for release: signing, versioning, and generating APK or AAB.
  - Publishing an app on Google Play Store: creating a developer account, uploading APK/AAB, writing descriptions.
  - Understanding Android monetization options: ads, in-app purchases, subscriptions.
  - Best practices for app marketing and optimization for app stores (ASO).
- **Assignment:**
  - Prepare an app for release and publish it on Google Play Store (simulated process).

Week 12: Final Project and Review

- **Topics:**
  - Bringing together all the Android development skills learned during the program.
  - Working on a final Android project (either individually or as a team).
  - Testing the app for bugs and optimizing performance.
  - Final project presentation and code review.
- **Assignment:**
  - Develop a complete Android application with a focus on user interface, data storage, networking, and background services.

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