Android Programming

This intensive, hands-on five-day course teaches programmers how to develop activities, services, content providers, and broadcast receivers for the Android platform. Students will first learn how to create activities using views, layouts, dialogs, and menus. Next, they will learn about intents, broadcast receivers, and services. Coverage of data storage is next with chapters on preferences, files, SQLite, data adapters, and content providers. Finally, the course ends with coverage of location-based services and application publishing. This course is current to Android 2.3, Gingerbread.

Course Objectives:

- Create an Android application.
- Create an activity and manage its lifecycle.
- Access resources programmatically to enable maintenance and localization.
- Create full-featured graphical user interfaces with widgets, dialogs, menus, and event handlers.
- Control the organization of your screen with layouts.
- Communicate between applications in a loosely-coupled way with intents.
- Listen for notifications from broadcast receivers.
- Create a service to handle background tasks and use notifications to indicate the status of those tasks.
- Persist application state using preferences, files, and SQLLite.
- Use both ArrayAdapter and CursorAdapter to bind data to widgets.
- Share data with other applications with content providers.
- Determine the current location and leverage Google Maps.
- Publish an application to an Android device.

Audience: Programmers with zero to six months developing applications for the Android platform.

Prerequisites: Introduction to Java or equivalent experience is required. Basic understanding of Java threads, Java inner classes and XML is recommended.

Number of Days: 5 days

1 Course Introduction
- Course Objectives
- Course Overview
- Using the Workbook
- Suggested References

2 Getting Started
- Android Overview
- Android Architecture
- The Dalvik VM
- Android Components
- Android SDK and Platform-tools
- Configuring and Using Eclipse for Android
- A Simple Android Application
- The Android Emulator
- User Interface Layouts
- Android Event Handlers
- LogCat

3 Activities
- Creating an Activity
- Activity Lifecycle
- Callback Methods
- Resource Conservation
- Intents
- AndroidManifest.xml
- Packaging

4 Resources
- Alternative Resources

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R.java
String Resources
StringArrays
Boolean and Integer Resources
Color and Dimension Resources
Image Resouces
System Resources
Localization
Format Strings

5 Views and Event Handlers
Views and ViewGroups
Common Properties
Text View
Edit Text
TextChanged Events
Button
Check Box and Toggle Button
Radio Group and Radio Buttons
DatePicker
ProgressBar and RatingBar
Threads and Handlers
AsyncTask

6 Layouts
Inflation
Linear Layout
FrameLayout
RelativeLayout
TableLayout
CombiningLayouts
Scrolling
Screen Orientation Changes
Graphical Layout Tool

7 Dialogs
Toast
Custom Toast
Dialogs
Dismissing a Dialog
AlertDialog
AlertDialog Buttons
AlertDialog Items
Custom Dialogs
ProgressDialog
DatePickerDialog

8 Menus
Menus and Menu Items
OptionsMenu
Reacting to Menu Item Selections
ContextMenu
Submenus
CheckBoxes and Radio Buttons in Menu Items

9 Intents and Broadcast Receivers
Android Components
Explicit Intents
Passing Extra Data to an Intent
Activities with Results
Implicit Intents
Intent Filters
Intent Filter Actions and Categories
Intent Filter Data
Broadcast Receivers
Registering Broadcast Receivers Programmatically
Registering Broadcast Receivers via the Manifest
Broadcasting Intents

10 Services
What is a Service?
Defining a Service: Extend IntentService
Defining a Service: Extend Service
Registering and Starting a Service
Stopping a Service
Creating a Bound Service
Binding to a Service
Remote Bound Services
Call a Remote Service
Service Lifecycle

11 Notifications
Notifications
Notification
Pending Intents
NotificationManager
Updating a Notification
Notification Fields

12 Data Storage: Preferences and Files
The Android File System
Preferences
Creating Preferences
Reading Preferences
Updating and Deleting Preferences
Using PreferenceScreen

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Manage Preferences with PreferenceActivity
Working with Files
openFileInput() and openFileOutput()
The cache Directory
ExternalStorage
RawResource Files
13 Data Storage: SQLite Database
SQLite
Android SQLite Classes
Executing SQL Statements
The raw query() and query Methods
Cursors
Managed Cursors
Encapsulate Data Access with an Adapter
Using SQLiteOpenHelper
Managing Database Upgrades
Inserting and Updating Data
Deleting Data
Transactions
14 Data Adapter Widgets
Data-Driven Adapter Controls
Adapters
ArrayAdapter
CursorAdapter
Simple Cursor Adapter
ListView
ListActivity
AdapterView Events
Spinner
AutoCompleteTextView
Gallery and GridView
The ViewHolder Pattern
15 Implementing a Content Provider
Content Providers
Content URIs and MIME Types
Implement the ContentProvider Interface
Sharing Your Data
Registering your Content Provider and Permissions
16 Accessing Contacts and Other Android Providers
Built-In Content Providers
Accessing Content Providers
Content URIs
Settings
Browser and Call Log
MediaStore
Contacts
Using ContactsContract
17 Location-Based Services
Location-Based Services
LocationManager and LocationListener
Registering a LocationListener
Location
Permissions
Determining Distance and Bearing
Geocoding and Reverse Geocoding
Proximity Alerts
Using Google's Map Service
Google Maps Android API
Displaying a Google Map withMapFragment
GoogleMap Gestures and Events
LatLng and the GoogleMap Camera
Markers and BitmapDescriptors
Polylines and Polygons
18 Publishing an Application
Publishing
Packaging and Signing
Distribution
Updates

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