Android Development Lab Programs 📱🧪

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📚 Table of Contents

📍 Overview

A comprehensive collection of fundamental Android programming examples demonstrating essential concepts in mobile app development. 📚💻 These programs cover various UI components, data handling, and Android framework features. 🛠️🔧

📋 Programs List

1. Login Form Authentication 🔐

- 📐 LinearLayout implementation for a basic login form
- 👤 Username and password fields using EditText
- ✅ Validates credentials against hardcoded values (e.g., Admin/1234)
- 🍞 Toast messages for successful/failed login feedback

2. Activity Lifecycle Demo 🔄

- 🔁 Demonstrates Android activity lifecycle methods (`onCreate()`, `onStart()`, etc.)
- 🔔 Toast messages at each lifecycle stage to visualize state changes

3. Calculator Application 🧮

- ➕➖✖️➗ Implements basic arithmetic operations (Add, Subtract, Multiply, Divide)
- ✅ Input validation and error handling
- 🧹 Clear button functionality to reset inputs
- 📏 Organized using LinearLayout for UI

4. UI Control Validations ✔️

- 📧 Validates email format using `Patterns.EMAIL_ADDRESS`
- 🔒 Checks password length (minimum 6 characters)
- ⚡ Real-time error feedback in a TextView
- 🎯 Uses `TextUtils` to check for empty fields

5. User Registration System 📝

- 💾 Stores user registration details using SharedPreferences
- 📧 Input fields for name and email
- 🧭 Navigates between registration and welcome screens
- 👤 Displays stored user data on the welcome screen

6. Facebook-Style Layout 🎨

- 👥 Facebook-style page created using RelativeLayout
- 🔄 Includes fallback logic for app/web navigation

7. Image Toggle Application 🖼️

- 🖼️ Implements image toggle functionality using FrameLayout
- 👆 Handles image switching on click
- 🎨 Simple and interactive UI

8. Adapter & Exception Handling 🛡️

- 📊 Uses GridView with ArrayAdapter for grid display
- 🎣 Exception handling for index-related errors

- 🍞 Toast messages for grid item clicks

9. Multi-Activity Navigation 🚀

- 🔗 Demonstrates navigation between two activities using Intents
- 🔘 Buttons to switch between activities
- 🔄 Basic activity lifecycle management

10. ListView Implementation 📜

- 📋 Implements ListView using ArrayAdapter
- 👆 Handles item click events with Toast messages
- 🔄 Displays dynamic lists

11. Spinner Component 🔄

- ⬇️ Dropdown menu created using Spinner
- 📝 ArrayAdapter for populating spinner items
- 👂 Handles selection events and updates a TextView with the chosen item

12. SQLite Database Operations 🗄️

- ➕🔍 Performs basic SQLite CRUD operations (Insert, Select)
- 🖊️ User data entry form for database inputs
- 📊 Displays stored records in a TextView
- 🛠️ Proper implementation of a database helper class

🛠️ Technical Requirements

- 🏗️ Android Studio
- ☕ Java programming knowledge
- 🗃️ SQLite database understanding
- 🎨 XML layout design skills

🎓 Learning Outcomes

- 📱 Understanding Android UI components
- 💾 Implementing data persistence
- 🔄 Managing activity lifecycle
- 👆 Handling user interactions
- 🗄️ Database integration
- 🛡️ Exception handling
- 🎨 Layout design principles

📝 Notes

- 📄☕ All programs include both XML and Java implementation
- 🧠 Each program demonstrates specific Android concepts
- 💡 Code includes comments for better understanding
- ✅ Programs follow Android best practices

Last Updated: November 19, 2024 📅