Lab Experiment No 1 : Developing a "Hello World" Android Application

**Objective:**

To introduce students to Android app development by guiding them through the process of creating a simple "Hello World" application. This lab will cover setting up the development environment, creating a new project, designing a basic user interface, and running the application on an emulator or physical device.

**Pre-requisites:**

* Basic understanding of Java or Kotlin programming language.
* Installed Android Studio IDE.
* Android SDK and Emulator setup.

1. **Setting Up the Development Environment**

**1. Install Android Studio:**

- Download and install Android Studio from the official website: [Android Studio](https://developer.android.com/studio).

**2. Set Up Android SDK:**

- During installation, Android Studio will prompt you to install the Android SDK. Ensure it is installed, as it contains the necessary tools and libraries.

**3. Create an Emulator (Optional):**

- Open Android Studio.

- Go to `AVD Manager` (Android Virtual Device Manager).

- Click on `Create Virtual Device` and follow the prompts to set up a new emulator.

1. **Creating a New Android Project**

**1. Launch Android Studio:**

- Open Android Studio and click on `Start a new Android Studio project`.

**2. Configure Your Project:**

- Project Name: HelloWorld

- Package Name: com.example.helloworld

- Save Location: Choose your preferred directory.

- Language: Choose Java or Kotlin.

- Minimum API Level: Select the appropriate API level (e.g., API 21: Android 5.0 (Lollipop)).

**3. Select Project Template:**

- Choose `Empty Activity` and click `Finish`.

1. **Designing the User Interface**

1. Open `activity\_main.xml`:

- Navigate to `res/layout/activity\_main.xml` in the project explorer.

2. Modify the Layout:

3. Customize UI Elements:

- Change the `TextView` properties such as text size, color, and style as needed.

- Set a background color for the `LinearLayout` using `android:background`.

**4. Adding Functionality (Optional)**

1. Adding a Button:

- Add a `Button` below the `TextView` in `activity\_main.xml`.

2. Implementing OnClickListener:

- In `MainActivity.java` or `MainActivity.kt`, set up an `OnClickListener` for the button.

**5. Running the Application**

1. Run on Emulator:

- Click on the green `Run` button or press `Shift + F10`.

- Choose the emulator you created and click `OK`.

2. Run on Physical Device:

- Enable Developer Options and USB Debugging on your Android device.

- Connect your device via USB.

- Select your device in the target device dropdown and click `Run`.

**6. Debugging and Testing**

- Test the application by running it on different devices or emulators with varying screen sizes and Android versions.

- Use Logcat in Android Studio to monitor the application’s behavior and troubleshoot any issues.

7. Submission Guidelines

- Project Files: Submit the entire project folder in a zip file.

- Screenshots: Include screenshots showing the application running with the "Hello World" text and any additional features implemented.

- Documentation: Provide a brief report explaining the steps followed, any challenges faced, and how they were resolved.

8. Evaluation Criteria

- Correctness: The application correctly displays "Hello World" and meets any additional requirements.

- UI Design: The user interface is clean, well-designed, and functional.

- Code Quality: The code is well-organized, commented, and follows best practices.

- Creativity: Additional features and customizations beyond the basic requirements.

\*\*\*