ANDROID AND ITS BACKGROUND DEVELOPMENTS

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ABSTRACT

Android is basically for touch screen purpose in mobile phones. Google play store has lots and lots of apps that are being developed and updated day today. Apps that run in mobile phones are mostly developed using Android Studio or eclipse. Android Studio is Android's official Integrated Development Environment built on Jetbrains' intellj IDEA software. Android studio helps in building apps with highest quality. Android studio offers tools such as rich code editing, profiling tool, debugging and testing. The app developed can run either in virtual device such as emulator or any connected mobile phone while testing.

This paper gives you a familiarity on what is android, android studio, how to develop an application and run in mobile phone.

Keywords: android studio, debug, android runtime, activity, layout, virtual device.

INTRODUCTION

Android is open source mobile operating system originally developed by android Inc,butGoogle owned it on 2005.The initial release date of android is 23 September 2008.Google incorporate android's IDE android studio to develop android mobile application(app).The mobile application[1] can be developed using java language. Google-enabled java libraries help the code in java language to control mobile devices[2]. A platform is needed to develop mobile application. Therefore it is important to download the android SDK (Software development kit), that compile code. Secondly download JDK (Java development kit).JDK contain compiler, debugger, JDE (Java runtime environment) that includes java libraries, java virtual machine, components to run applet programming etc. To install the application in the mobile or any hardware device we should create android virtual device (AVD). APK (Android package kit) file contains all contents of android app[1].

STUDY

A)   Application Framework
Android application framework is a technique of developing an android application in java coding in the android platform with the help of tools and API libraries provided by android SDK[3].

Application framework supports various media and features such as video,audio, device emulator, debugging tool etc.

B)   Android Runtime
The functionalities of Java coding is available in the set of core libraries of android. Dalvik virtual machine allows android application to run on its own process. To optimize minimum memory Dalvik virtual machine[4] execute file in (.dex) Dalvik executable format. Some developments for mobile devices can be made with DVM which is a register virtual machine.

c) Android Operating System
Based on the Linux kernel platform the mobile operating system android[5] was developed. For mobile devices android is a free downloadable open source software stack.The most used and convenient operating system is android. The applications developed using android OS has different delivering methods and computing platform. With the market share of 48% android is the most used operating system.
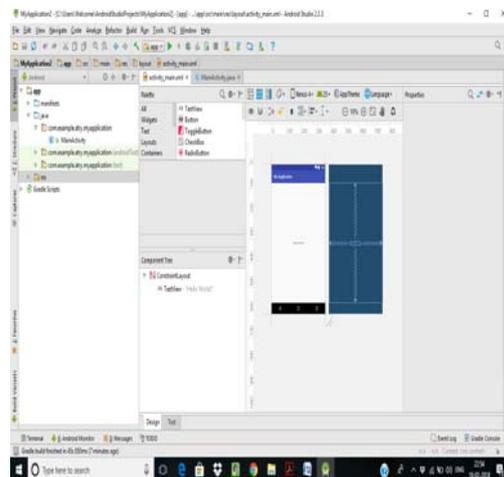
D)   Android platform overview
The major components of android platform are system apps(such as Dialer, Calendar, Camera, Email,….), Java API framework->content provider-View system- Managers(such as activity, location, package, notification, resource, telephony, window,….),Native C/C++ libraries(Web kit, OpenMax AL, Media framework,….)Android runtime(Android runtime(ART) , Core libraries),Hardware abstraction layer(Audio, Bluetooth, Camera, Sensor,..),Linux kernel(drivers-Audio, Binder, Display, Keypad, Bluetooth, Camera, Shared memory, USB, wifi) and power management.
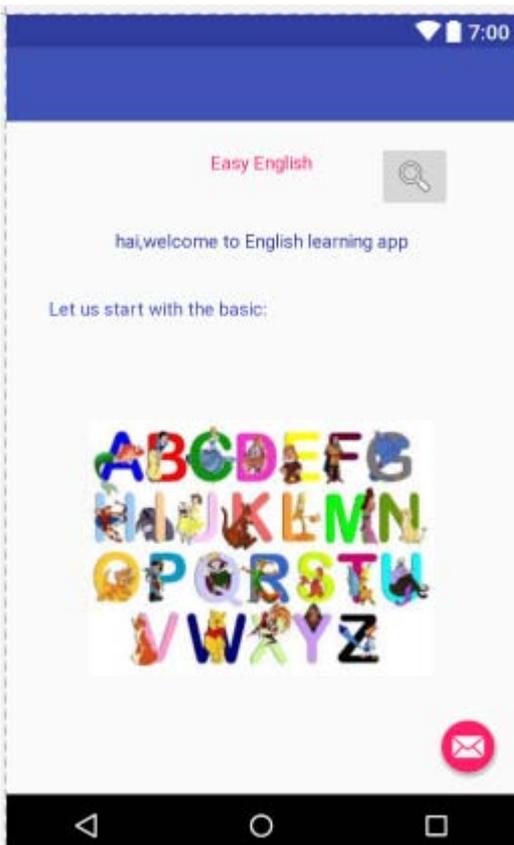
DEVELOPMENT OF AN APP

A) Working with layout and Activity
After opening the android studio,
-        Click File -> New -> New Project
-        Specify the application name, minimum SDK and type of activity.
-        Then customize the activity and click finish.
-        Once the gradle build is finished, go to res ->layout ->activity_main.xml ,in this we can design the layout.

Conference Paper: International Conference on *"Recent Advances in Computing and Communication"*
Organized by: Department of Computer Science, SSS Shasun Jain College for Women, Chennai, India

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- For creating code in java file for actions, in project file go to java folder and select the application package and click on the MainActivity.java and specify the java coding and link with the layout.xml


```
package com.example.welcome.easyenglish;

import ...

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```
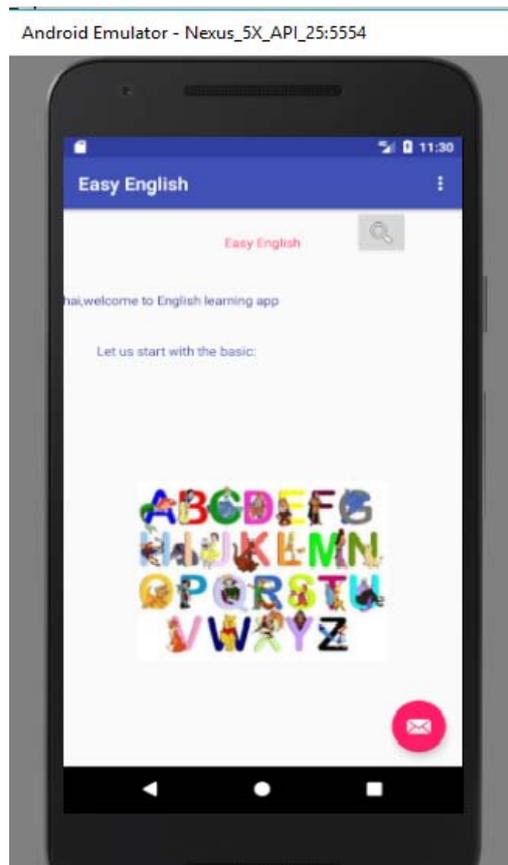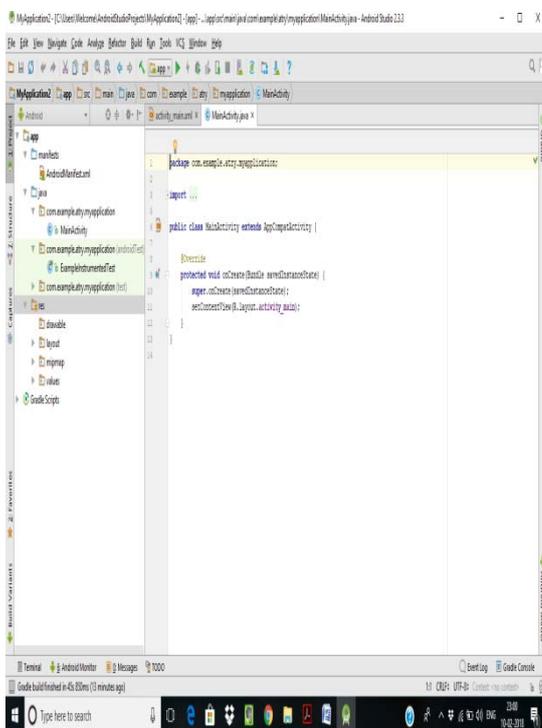
E)   Running of app

To run[6] the app in virtual machine or in mobile phone, first click the Run 'app' button or press Shift +F10.

Now from the select deployment target dialog box select the connected device or available virtual device or create a new virtual device and click ok.

When target device comes online, the activity is launched in the emulator as follow.

If error is generated in the coding, then the activity will not be launched in the emulator. We must debug the bug and then proceed with running the activity. The type of bug will be given at the bottom in order to resolve the error easily.

F)   Setting up android manifest

The icon of the application should be specified in the AndroidManifest.xml. The image that should be kept as icon is to be placed in mipmap folder. The activity that is launcher(default) is also specified in tAndroidManifest.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.welcome.easyenglish">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="Easy English"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity
            android:name=".Basics"
            android:label="Easy English"
            android:theme="@style/AppTheme.NoActionBar">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity android:name=".MainActivity"></activity>
    </application>

</manifest>
```

## LIFECYCLE OF ACTIVITY

A)   Activity states

There are four states of activity, they are:

- **Running:** The activity is visible to the user and interactive.

- **Paused:** The activity is partially hidden but still running visibly and can be killed by the system at any time.

- **Stopped:** Activity is invisible but running and might be killed at anytime by the system.

- **Killed:** By calling finish() method, the system terminates the activity.

B)   Lifecycle methods

When the following methods are called some operations are performed,

- **onCreate():** The activity is called

- **onResume():**The activity becomes   visible and starts to interact with the activity again

- **onPause():** The activity becomes invisible, leaving space to some other activity.

- **onStop():** Called when no longer the activity is visible.
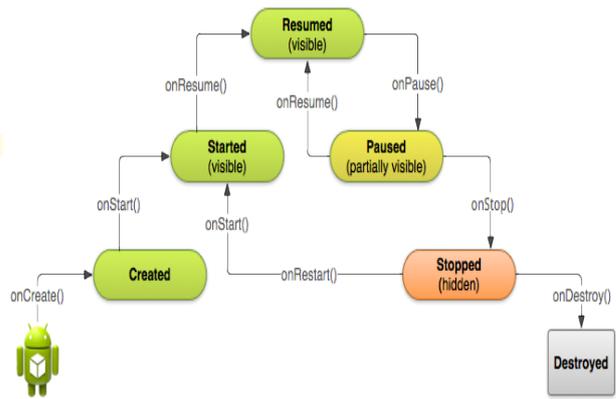
HISTORY OF ANDROID VERSIONS:

Code nameAPI level

	Code name	API level
✓	Alpha1	
✓	Beta	2

Internally known as
("Petit Four")

	Code name	API level
✓	Cupcake	3
✓	Donut	4
✓	Eclair	5-7
✓	Froyo	8
✓	Gingerbread	9-10
✓	Honeycomb	11-13
✓	Ice cream Sandwich	14-15
✓	Jellybean	16-18
✓	Kitkat	19-20
✓	Lollipop	21-22
✓	Marshmallow	23
✓	Nougat	24-25
✓	Oreo	26-27

SCOPE OF APP DEVELOPMET

Around the world mobile phones are used rapidly by huge crowd. Now-a-days it is impossible to imagine a world without mobile phones. With the mobile phones it is like all comforts are in our hand. There are lots of demands for advanced applications and updates.The mobile application development has just emerged so it has long way to vanish. It is a low cost app development platform so it has high scope. According to the global figure there are more than 85% smartphone running in android OS. Therefore there are advantage and scope in android development[4]. There are different OS[7](such as Apple, Windows 7) from which mobile application can be developed development. Till the utilization of mobile phones increase, the scope of android development increases.

CHALLENGES IN MOBILE APP DEVELOPMENT

All android applications packages are signed with certificate. The developer holds the private key of the certificate[5] since because it is authentic. The big challenge is that the app is not able to achieve high coverage. This is partial because it was designed for user input and cannot generate automatically such as login. Therefore the automated testing tool is unable to proceed. Another challenge is energy issue , since the state-of-the-art tool is not easily accessible to developers. The biggest challenge is that the app should be created on the demand in the in the market enterprise. The developer should look after whether the app have high performance, battery life, less memory utilizing, lack of transparency[5] by app store.

CONCLUSION

Development of android application has become very simple and easy. These applications are developed mainly to serve people with all the facilities in their hands and also to give entertainment by the means of gaming that includes lots of animations that interest them.Each and every day lots of apps are being created and updated. In future the demand in apps will be rapidly increasing and different advanced features will develop.Apps were created and will be created in an interactive manner since because artificial intelligence is also developing day by day rapidly. In future almost all mobile applications will have sensors, face recognization, etc. Though android application development has some challenges it has high scope and great market value. Developing android application is a easy task.

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