



# Android Basics

**COM S 309 Recitation**

**IOWA STATE UNIVERSITY**

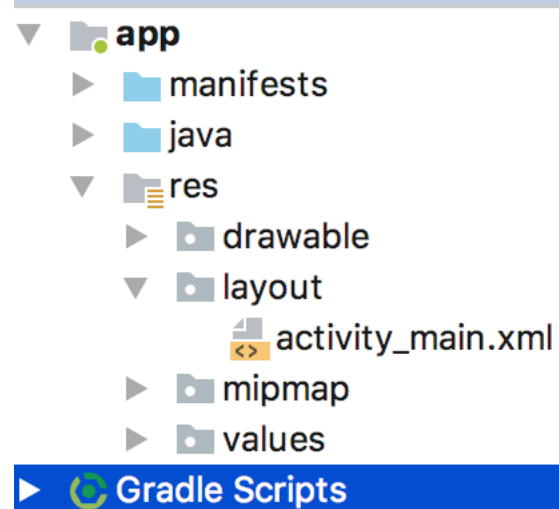
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# Tasks

- Basics
  - Create two buttons.
  - Associate one button with an `OnClickListener()` to move from the `main_activity` to a new activity.
  - Display some toast message on clicking the second button.
- Permissions and Intent
  - Create an application to send SMS.

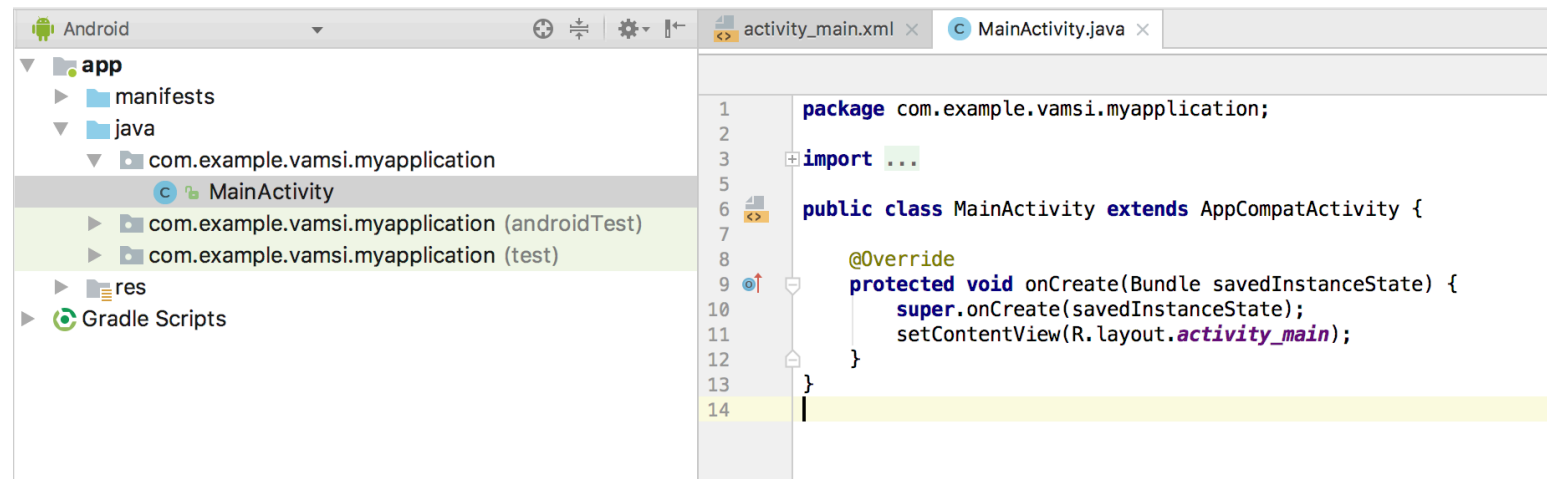
# Android Structure

- In android the UI and the application logic are separated.
- The UI files are located under the res -> layout.
- The UI files will have an xml extension.



# Android Structure(cont)

- The Logic/Application code is place under java-> your package name.
- Create folders and add your java classes for better maintainability.



The screenshot displays the Android Studio interface. On the left, the 'Project' view shows the directory structure: 'app' contains 'manifests', 'java', 'res', and 'Gradle Scripts'. The 'java' directory is expanded, showing the package 'com.example.vamsi.myapplication' with a sub-package 'com.example.vamsi.myapplication' containing 'MainActivity'. The 'MainActivity.java' file is open in the editor. The code defines the package, imports necessary classes, and implements the 'onCreate' method by extending 'AppCompatActivity'.

```
1 package com.example.vamsi.myapplication;
2
3 import ...
4
5
6 public class MainActivity extends AppCompatActivity {
7
8     @Override
9     protected void onCreate(Bundle savedInstanceState) {
10         super.onCreate(savedInstanceState);
11         setContentView(R.layout.activity_main);
12     }
13 }
14
```

# Manifest File

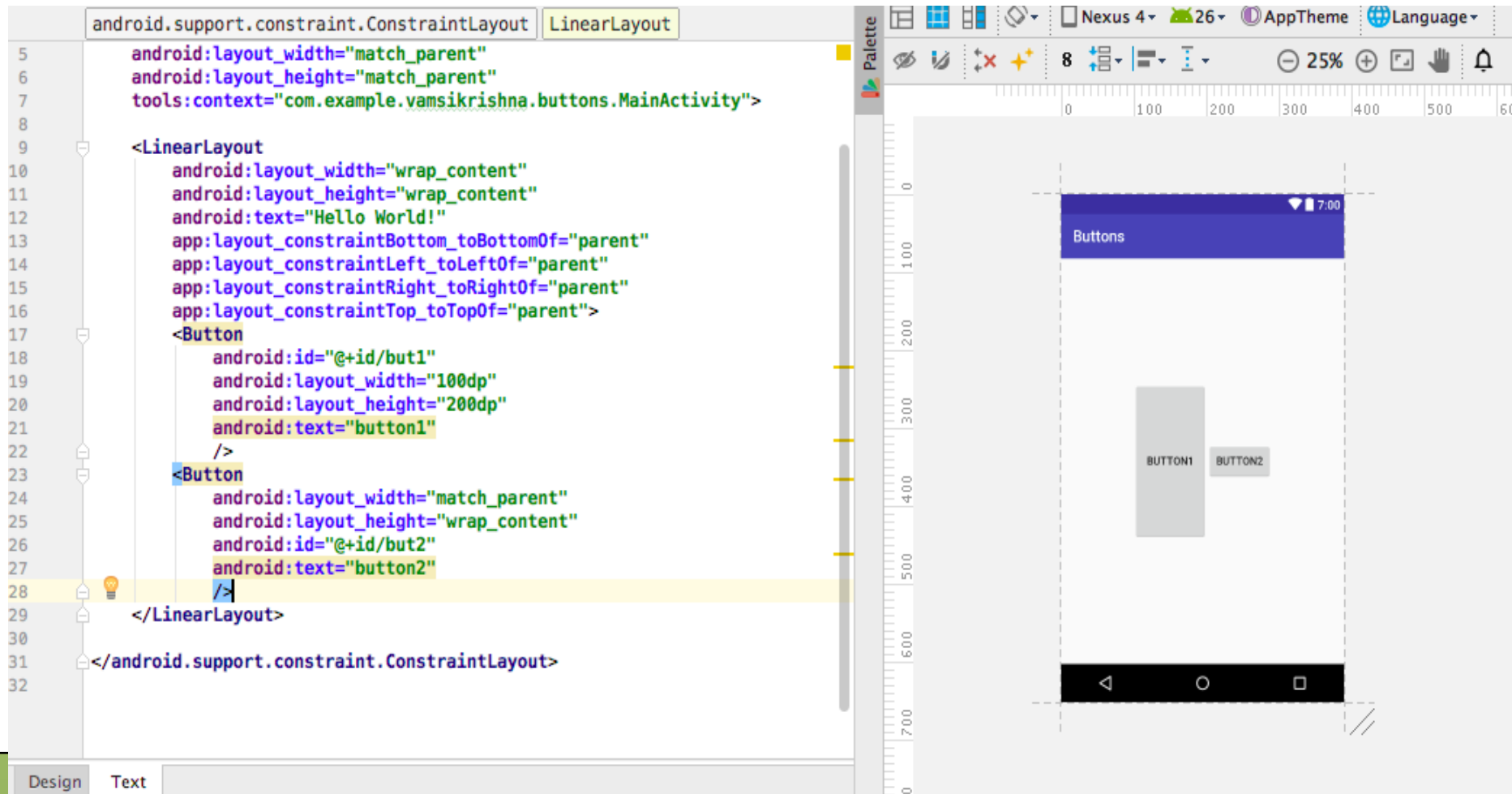
- Every Android Project must have a manifest file.
- Manifest File has all the information about your app.
- Eg. It contains the permissions, build tools.
- Please refer this link  
<https://developer.android.com/guide/topics/manifest/manifest-intro>.

# Gradle

- It's toolkit used by android to enhance and manage the build process.
- It contains all the necessary build configurations.
- Eg. It contains the libraries used for this app, It contains the SDK versions for your app.
- Please refer to this <https://developer.android.com/studio/build/>.

# Task 1

- Assuming you have created an empty project(Please Refer to Android linking with GIT tutorial).
- Step 1: create two buttons.



# Step 2: Add listeners

```
package com.example.vamsikrishna.buttons;

import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    Button b1,b2;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        b1=(Button)findViewById(R.id.but1);
        b2=(Button)findViewById(R.id.but2);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent i=new Intent(MainActivity.this,home.class);
                startActivity(i);
            }
        });
        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Toast.makeText(getApplicationContext(),"hello button2",Toast.LENGTH_LONG).show();
            }
        });
    }
}
```



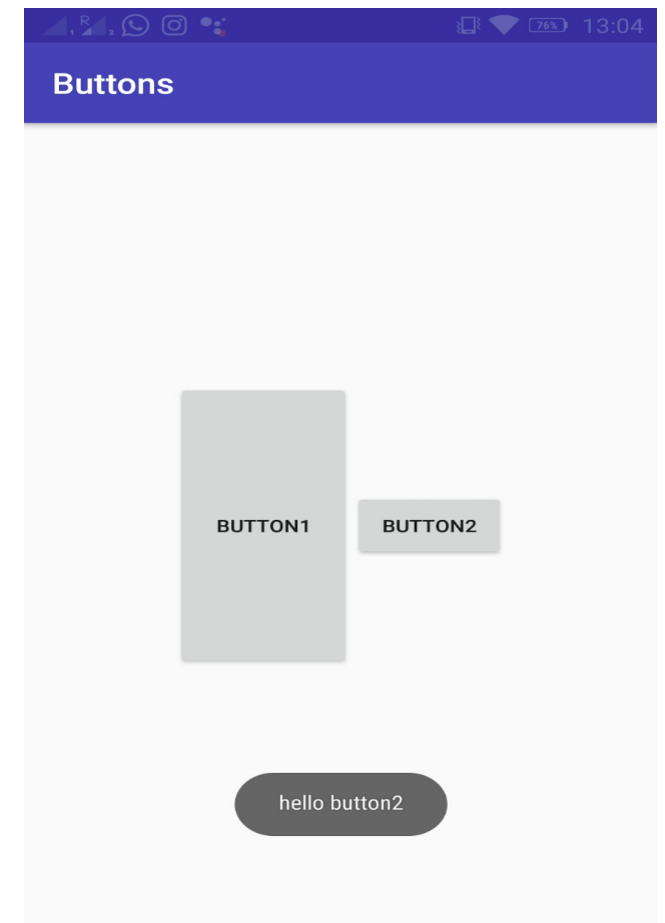
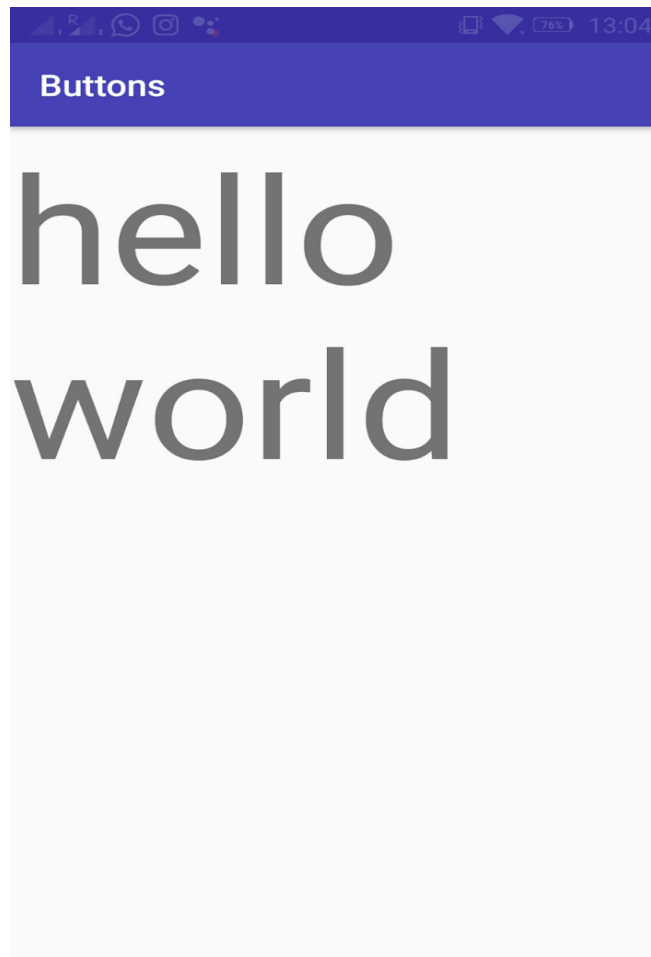
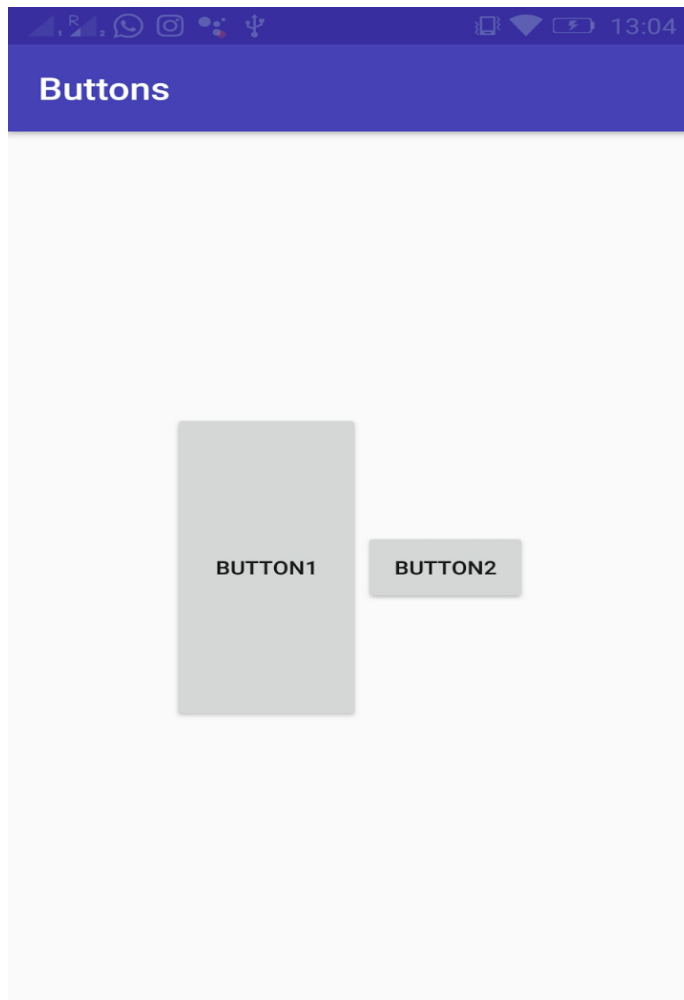
## Step 3: Create new activity named home

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.example.vamsikrishna.buttons.home">
    <TextView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:text="hello world"
        android:textSize="100dp"
    />
</android.support.constraint.ConstraintLayout>
```

## Step 4

Build it and run using virtual machine or your android device

# Step 5: Output



## TASK 2 (Sending Message Using Intent/SMS Manager)

- Step 1: add permission in AndroidManifest.xml

```
<uses-permission android:name="android.permission.SEND_SMS" />
```

# Step 2: Create UI for Sending Message

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.example.vamsikrishna.message.MainActivity">

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:orientation="vertical"
    >
    <TextView
        android:id="@+id/text"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Complete the fields to send a sms"
        android:textAppearance="?android:attr/textAppearanceMedium" />

    <EditText
        android:id="@+id/phoneNumber"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="ex: 1234567890"
        android:inputType="phone" />

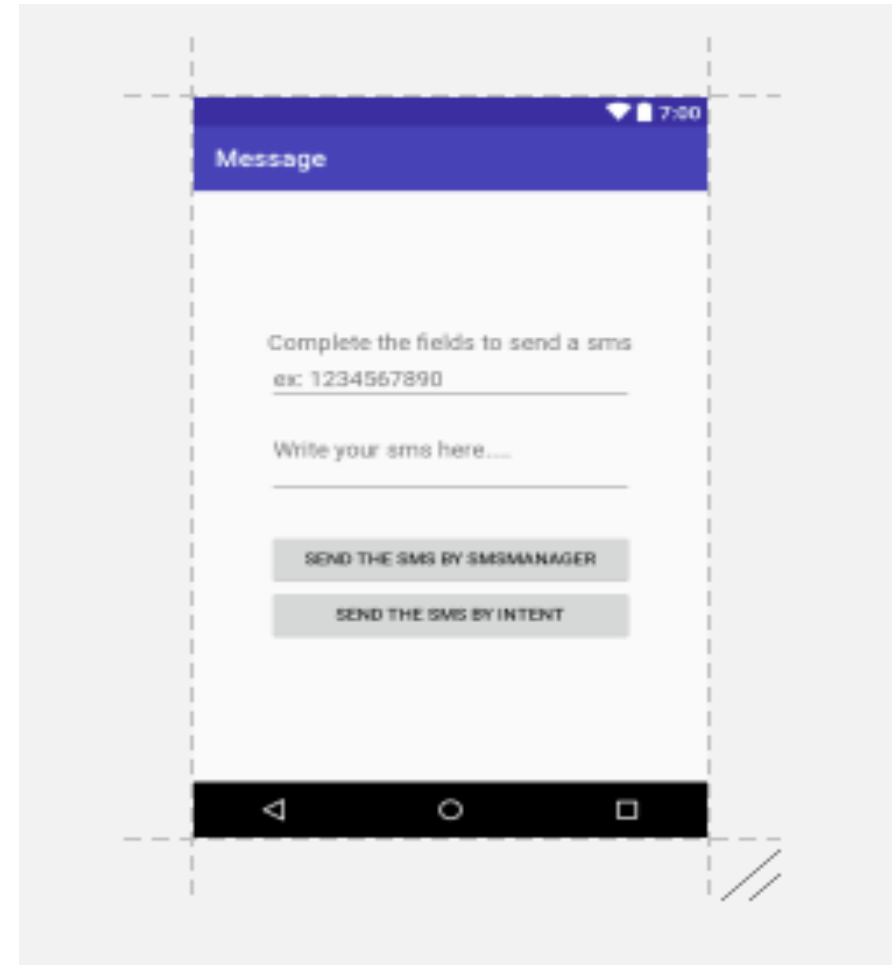
    <EditText
        android:id="@+id/smsBody"
        android:layout_width="fill_parent"
        android:layout_height="80dp"
        android:layout_marginBottom="30dp"
        android:hint="Write your sms here...." />

    <Button
        android:id="@+id/smsManager"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Send the sms by SmsManager" />

    <Button
        android:id="@+id/smsSIntent"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Send the sms by intent" />

</LinearLayout>

</android.support.constraint.ConstraintLayout>
```



# STEP 3 : Define the listeners using manager and intent

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.example.vamsikrishna.message.MainActivity">
```

```
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Hello World!"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    android:orientation="vertical"
    >
```

```
<TextView
    android:id="@+id/text"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Complete the fields to send a sms"
    android:textAppearance="?android:attr/textAppearanceMedium" />
```

```
<EditText
    android:id="@+id/phoneNumber"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:ems="10"
    android:hint="ex: 1234567890"
    android:inputType="phone" />
```

```
<EditText
    android:id="@+id/smsBody"
    android:layout_width="fill_parent"
    android:layout_height="80dp"
    android:layout_marginBottom="30dp"
    android:hint="Write your sms here...." />
```

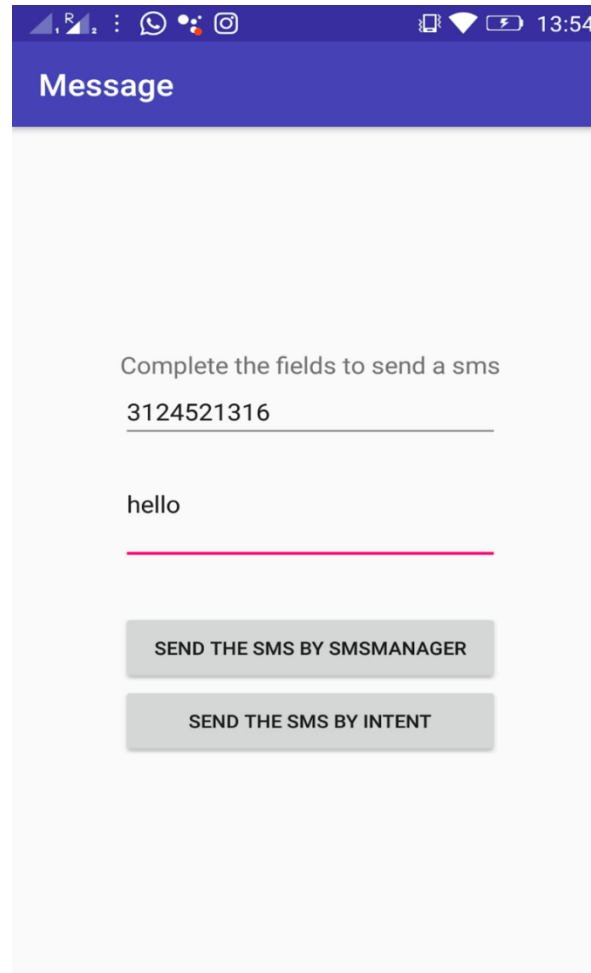
```
<Button
    android:id="@+id/smsManager"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Send the sms by SmsManager" />
```

```
<Button
    android:id="@+id/smsSIntent"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Send the sms by intent" />
```

```
</LinearLayout>
```

# Step 4: Build and Run the .apk

- Output



The screenshot shows an Android application window titled "Message". The status bar at the top displays various icons and the time 13:54. The app's main content area has a light gray background. It contains a text input field with the placeholder text "Complete the fields to send a sms" and the value "3124521316". Below this is another text input field with the value "hello". At the bottom, there are two gray buttons: "SEND THE SMS BY SMSMANAGER" and "SEND THE SMS BY INTENT".

Code Courtesy:  
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(vamsi@iastate.edu)



# More References

- <https://developer.android.com/training/index.html>
- <http://www.appinventor.org/>
- <https://www.tutorialspoint.com/android/index.htm>
- <https://www.youtube.com/user/androiddevelopers>
- <https://www.androidhive.info/>