PRACTICAL 1

Aim: Introduction to Android, Introduction to Android Studio IDE, Application Fundamentals: Creating a Project, Android Components, Activities, Services, Content Providers, Broadcast Receivers, Interface overview, Creating Android Virtual device, USB debugging mode, Android Application Overview. Simple "Hello World" program.
Code:

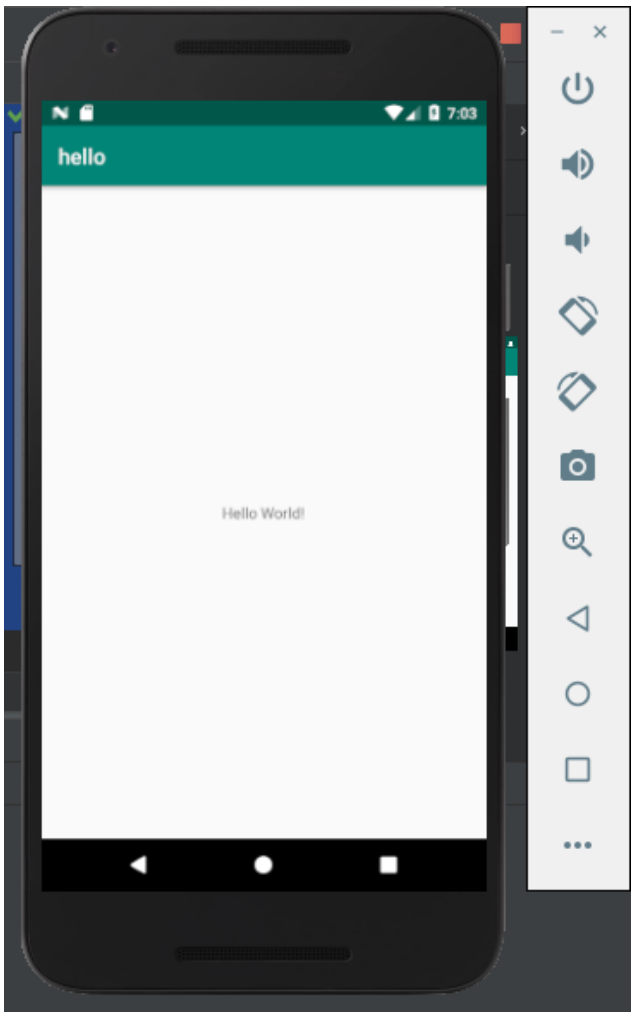
Activity_Main.Kt

```
package com.rohit.hello

import android.support.v7.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {

   override fun onCreate(savedInstanceState: Bundle?) {
      super.onCreate(savedInstanceState)
      setContentView(R.layout.activity_main)
   }
}
```

Activity_Main.xml

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

   <TextView
         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.support.constraint.ConstraintLayout>
```

Output:



PRACTICAL 2

Aim: Programming Resources
Android Resources: (Color, Theme, String, Drawable, Dimension, Image).
Color:

Color.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="colorPrimary">#008577</color>
    <color name="colorPrimaryDark">#00574B</color>
    <color name="colorAccent">#D81B60</color>
</resources>
```

Theme:
Style.xml

```
<resources>

    <!-- Base application theme. -->
    <style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
        <!-- Customize your theme here. -->
        <item name="colorPrimary">@color/colorPrimary</item>
        <item name="colorPrimaryDark">@color/colorPrimaryDark</item>
        <item name="colorAccent">@color/colorAccent</item>
    </style>

</resources>
```

String:

String.xml:

```
<resources>
    <string name="app_name">hello</string>
    <string name="numbers">
        <item>1</item>
        <item>2</item>
        <item>3</item>
        </item>
    </string>
</resources>
```

Dimension, Image:
Main_Activity.kt:

```
package com.rohit.drwable

import android.support.v7.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}
```

activity_main.xml:

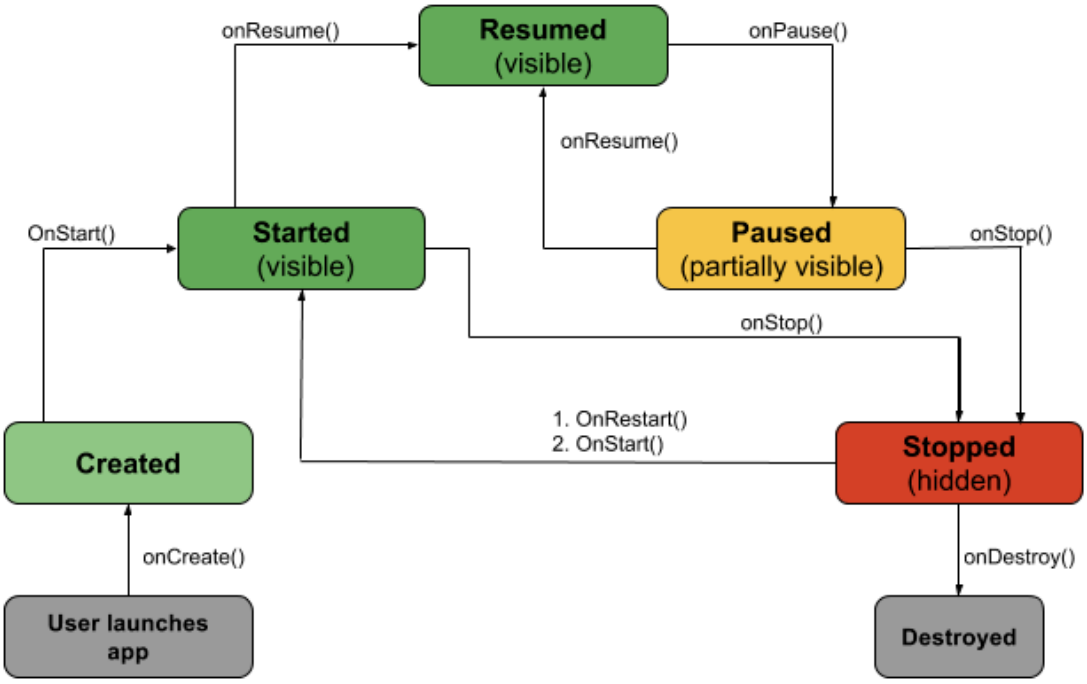
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
        xmlns:android="http://schemas.android.com/apk/res/android"
        xmlns:tools="http://schemas.android.com/tools"
        xmlns:app="http://schemas.android.com/apk/res-auto"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:context=".MainActivity"
        android:background="@drawable/one">

    <TextView
            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"/>

</LinearLayout>
```

Output:

PRACTICAL 3

Aim: Programming Activities and fragments
Activity Life Cycle, Activity methods, Multiple Activities, Life Cycle of fragments and multiple fragments.

Activity Lifecycle:



Main_Activity.kt:

```
import android.os.Bundle
import android.support.design.widget.Snackbar
import android.support.v7.app.AppCompatActivity
import android.view.Menu
import android.view.MenuItem
import android.util.Log
import kotlinx.android.synthetic.main.activity_state_change.*
class StateChangeActivity : AppCompatActivity() {

    val TAG = "StateChange"

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_state_change)
        setSupportActionBar(toolbar)

        fab.setOnClickListener { view ->
            Snackbar.make(view, "Replace with your own action",
                Snackbar.LENGTH_LONG)
                .setAction("Action", null).show()
        }
        Log.i(TAG, "onCreate")
    }
}
override fun onStart() {
    super.onStart()
    Log.i(TAG, "onStart")
}

override fun onResume() {
```

```
    super.onResume()
    Log.i(TAG, "onResume")
}

override fun onPause() {
    super.onPause()
    Log.i(TAG, "onPause")
}

override fun onStop() {
    super.onStop()
    Log.i(TAG, "onStop")
}

override fun onRestart() {
    super.onRestart()
    Log.i(TAG, "onRestart")
}

override fun onDestroy() {
    super.onDestroy()
    Log.i(TAG, "onDestroy")
}

override fun onSaveInstanceState(outState: Bundle?) {
    super.onSaveInstanceState(outState)
    Log.i(TAG, "onSaveInstanceState")
}

override fun onRestoreInstanceState(savedInstanceState: Bundle?) {
    super.onRestoreInstanceState(savedInstanceState)
    Log.i(TAG, "onRestoreInstanceState")
}
```

Multiple Activities:

activity_first.xml code:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
xmlns:app="http://schemas.android.com/apk/res-auto"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context="ganeshannt.frist.FristActivity">

<Button
android:id="@+id/button2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:onClick="Ganesh"
android:text="click third activity"
android:textColor="@color/colorPrimary"
app:layout_constraintTop_toTopOf="parent"
tools:layout_editor_absoluteX="168dp"
android:layout_alignParentBottom="true"
android:layout_toEndOf="@+id/text"
android:layout_marginBottom="196dp" />

<TextView
```

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="This s my first app!"
android:id="@+id/text"
tools:layout_editor_absoluteY="8dp"
tools:layout_editor_absoluteX="8dp" />
<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/button"
android:text="click second activity"
android:textColor="@color/colorPrimary"
android:onClick="Ganesh"
tools:layout_editor_absoluteX="168dp"
app:layout_constraintTop_toTopOf="parent"
android:layout_above="@+id/button2"
android:layout_alignStart="@+id/button2"
android:layout_marginBottom="40dp" />

</RelativeLayout>
```

activity_second.xml code:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:orientation="vertical" android:layout_width="match_parent"
android:layout_height="match_parent">

<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_margin="20pt"
android:text="second acticity is working...."
android:textAllCaps="true"
android:textColor="@color/colorPrimaryDark"/>

</LinearLayout>
```

activity_third.xml code:

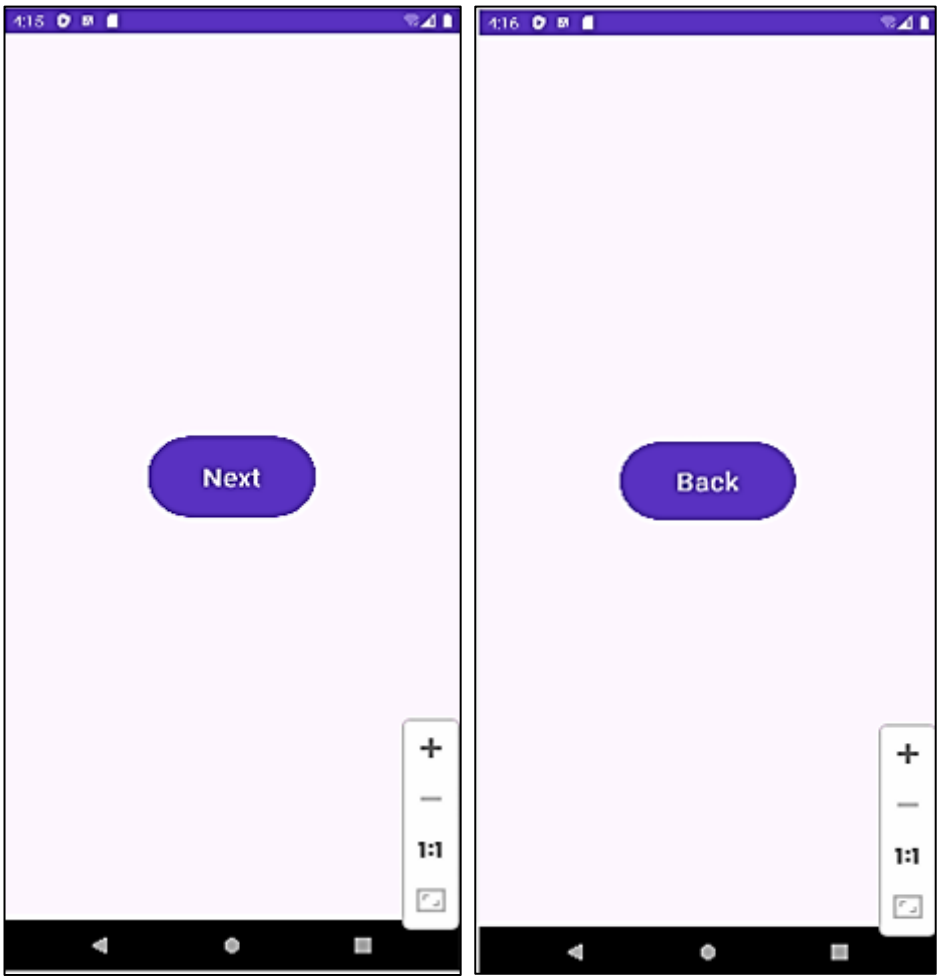
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:orientation="vertical" android:layout_width="match_parent"
android:layout_height="match_parent">

<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_margin="20pt"
android:text="Third activity is working ....."
android:textAllCaps="true"
android:textColor="@color/colorPrimary"
/>

</LinearLayout>
```

Activity_first.kt

```
package rohit.technobeat
import android.content.Intent
import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import kotlinx.android.synthetic.main.activity_login.*
```

```
import kotlinx.android.synthetic.main.activity_main.*
import kotlinx.android.synthetic.main.activity_register.*
import rohit.technobeat.R.id.login
import rohit.technobeat.R.id.newaccount

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        second.setOnClickListener {
            val intent = Intent(this, Activity_second::class.java)
            // start your next activity
            startActivity(intent)
        }

        third.setOnClickListener {
            val intent = Intent(this, Activity_third::class.java)
            // start your next activity
            startActivity(intent)
        }


    }
}
```

Output:



PRACTICAL 4

Aim: Programs related to different Layouts

Coordinate, Linear, Relative, Table, Absolute, Frame, List View, Grid View.

1. linear layout:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="fill_parent"
android:layout_height="fill_parent"
android:orientation="vertical" >

<Button android:id="@+id/btnStartService"
android:layout_width="270dp"
android:layout_height="wrap_content"
android:text="start_service"/>

<Button android:id="@+id/btnPauseService"
android:layout_width="270dp"
android:layout_height="wrap_content"
android:text="pause_service"/>

<Button android:id="@+id/btnStopService"
android:layout_width="270dp"
android:layout_height="wrap_content"
android:text="stop_service"/>

</LinearLayout>
```

2. Relative:

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="fill_parent"
android:layout_height="fill_parent"
android:paddingLeft="16dp"
android:paddingRight="16dp" >

<EditText
android:id="@+id/name"
android:layout_width="fill_parent"
android:layout_height="wrap_content"
android:hint="@string/reminder" />

<LinearLayout
android:orientation="vertical"
android:layout_width="fill_parent"
android:layout_height="fill_parent"
android:layout_alignParentStart="true"
android:layout_below="@+id/name">

<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="New Button"
android:id="@+id/button" />

<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="New Button"
android:id="@+id/button2" />
```

```
</LinearLayout>

</RelativeLayout>
```

3. Table:

Activity_main.xml

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

    <TableLayout android:layout_width="wrap_content"
        android:layout_height="wrap_content"
    android:layout_marginLeft="50dp"
    android:layout_marginTop="150dp">
      <TableRow>
        <Button
        android:id="@+id/btn1"
        android:text="1"
        android:layout_gravity="center"
        />
        <Button
            android:id="@+id/btn2"
            android:text="2"
            android:layout_gravity="center"
        />
        <Button
          android:id="@+id/btn3"
          android:text="3"
          android:layout_gravity="center"
        />
      </TableRow>
      <TableRow>
        <Button
            android:id="@+id/btn4"
            android:text="4"
            android:layout_gravity="center"
        />
        <Button
            android:id="@+id/btn5"
            android:text="5"
            android:layout_gravity="center"
        /><Button
          android:id="@+id/btn6"
          android:text="6"
          android:layout_gravity="center"
      />
      </TableRow>
      <TableRow>
        <Button
            android:id="@+id/btn7"
            android:text="7"
            android:layout_gravity="center"
        />
        <Button
            android:id="@+id/btn8"
```

```
                android:text="8"
                android:layout_gravity="center"
            /><Button
                android:id="@+id/btn9"
                android:text="9"
                android:layout_gravity="center"
        />
        </TableRow>
    </TableLayout>
</LinearLayout>
```

Main_Activity.kt:

```
package com.r.table_view
import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import kotlinx.android.synthetic.main.activity_main.*
import org.jetbrains.anko.toast

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        btn1.setOnClickListener {
            toast("1")
        }
        btn2.setOnClickListener {
            toast("2")
        }
        btn3.setOnClickListener {
            toast("3")
        }
        btn4.setOnClickListener {
            toast("4")
        }
        btn5.setOnClickListener {
            toast("5")
        }
        btn6.setOnClickListener {
            toast("6")
        }
        btn7.setOnClickListener {
            toast("7")
        }
        btn8.setOnClickListener {
            toast("8")
        }
        btn9.setOnClickListener {
            toast("9")
        }


    }
}
```

Output:

4. **Frame**:

Activity_main.xml

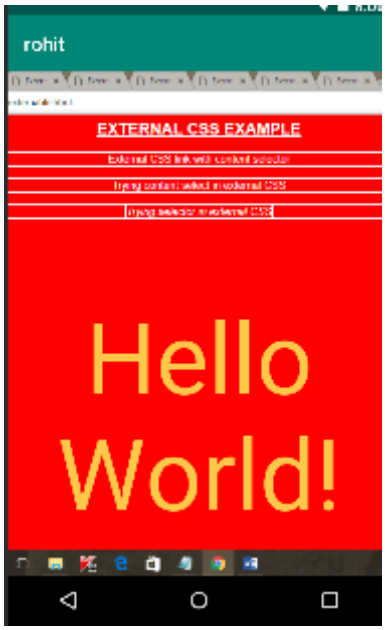
```
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout
        xmlns:android="http://schemas.android.com/apk/res/android"
        xmlns:tools="http://schemas.android.com/tools"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:context=".MainActivity">

    <ImageView android:layout_width="match_parent"
             android:layout_height="match_parent"
             android:src="@drawable/red"
             android:scaleType="centerCrop"/>
    <TextView
            android:textSize="100dp"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Hello World!"
            android:gravity="center"
            android:textColor="@color/rohit"
            android:layout_marginTop="220dp"
            />

</FrameLayout>
```

Activity_main.kt

```
package com.rohit.frame_layout
import android.support.v7.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
```

```
        setContentView(R.layout.activity_main)
    }
}
```

output:



5. List View:

Activity_main.xml

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

   <Button android:layout_width="wrap_content"
          android:layout_height="wrap_content"
           android:id="@+id/btn"
           android:text="Click me to view list"
           android:layout_marginTop="200dp"
           android:layout_marginLeft="90dp"/>
</LinearLayout>
```

String.xml

```
<resources>
    <string name="app_name">list</string>
    <array name="insert_list">
        <item>one</item>
        <item>two</item>
        <item>three</item>
        <item>four</item>
        <item>five</item>
        <item>six</item>
        <item>seven</item>
        <item>eight</item>
        <item>nine</item>
        <item>ten</item>
```

```
    </array>
</resources>
```

Activity_list_view.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<ListView
        xmlns:android="http://schemas.android.com/apk/res/android"
        xmlns:tools="http://schemas.android.com/tools"
        xmlns:app="http://schemas.android.com/apk/res-auto"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:context=".list_view" android:entries="@array/insert_list">

</ListView>
```

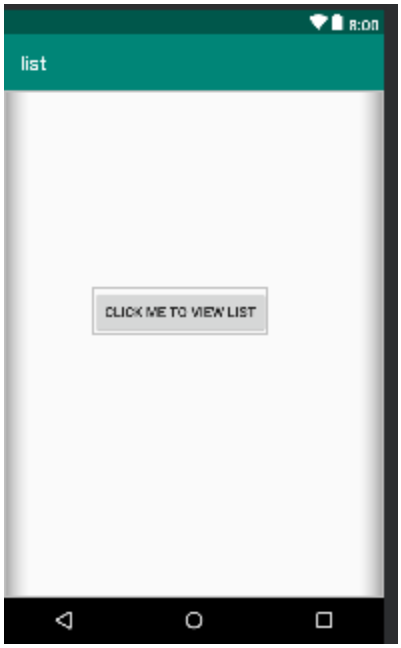
List_view.kt:

```
package com.rohit.list

import android.support.v7.app.AppCompatActivity
import android.os.Bundle

class list_view : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_list_view)
    }
}
```

main_Activity.kt

```
package com.rohit.list
import android.content.Intent
import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import kotlinx.android.synthetic.main.activity_main.*
class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        btn.setOnClickListener {
            val intent =Intent(this, list_view::class.java)
            startActivity(intent)
        }

    }
}
```

Output:



6. Grid layout:

```
<?xml version="1.0" encoding="utf-8"?>
<GridLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:rowCount="3"
    android:columnCount="3"
    android:padding="20dp">

  <Button
      android:layout_width="110dp"
      android:layout_height="100dp"
      android:text="1"/>

  <Button
      android:layout_width="110dp"
      android:layout_height="100dp"
      android:text="2"/>
  <Button
      android:layout_width="110dp"
      android:layout_height="100dp"
      android:text="3"/>
  <Button
      android:layout_width="110dp"
      android:layout_height="100dp"
      android:text="4"/>

  <Button
      android:layout_width="110dp"
      android:layout_height="100dp"
      android:text="5"/>
  <Button
      android:layout_width="110dp"
```

```
        android:layout_height="100dp"
        android:text="6"/>
    <Button
        android:layout_width="110dp"
        android:layout_height="100dp"
        android:text="7"/>

    <Button
        android:layout_width="110dp"
        android:layout_height="100dp"
        android:text="8"/>
    <Button
        android:layout_width="110dp"
        android:layout_height="100dp"
        android:text="9"/>

</GridLayout>
```

mainActvity.kt:

```
package com.rohit.grid_layout

import android.support.v7.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}
```

output:

PRACTICAL 5

Aim: Programming UI elements
Design App With UI:
mainActivity.kt:

```
package rohit.technobeat
import android.content.Intent
import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import kotlinx.android.synthetic.main.activity_login.*
import kotlinx.android.synthetic.main.activity_main.*
import kotlinx.android.synthetic.main.activity_register.*
import rohit.technobeat.R.id.login
import rohit.technobeat.R.id.newaccount
class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        login.setOnClickListener {
            val intent = Intent(this, LoginActivity::class.java)
            // start your next activity
            startActivity(intent)
        }

        newaccount.setOnClickListener {
            val intent = Intent(this, RegisterActivity::class.java)
            // start your next activity
            startActivity(intent)
        }

    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center_horizontal"
    android:orientation="vertical"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    android:background="@drawable/home"
    tools:context=".MainActivity">

    <ScrollView
        android:id="@+id/login_form"
        android:layout_width="match_parent"
        android:layout_height="match_parent">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="vertical"
            android:gravity="center">


            <android.support.v7.widget.AppCompatTextView
```

```
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginTop="210dp"
            android:alpha="0.7"
            android:text="TECHNOBEAT"
            android:textColor="#000000"
            android:textSize="33dp"
            android:textStyle="bold"
            tools:layout_marginLeft="85dp" />


        <Button
            android:id="@+id/login"
            style="?android:textAppearanceSmall"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="16dp"
            android:text="Login"
            android:background="@drawable/round_button"
            android:alpha="0.8"
            android:textStyle="bold" />
        <Button
            android:id="@+id/newaccount"
            style="?android:textAppearanceSmall"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="16dp"
            android:text="REGISTER"
            android:background="@drawable/round_button"
            android:alpha="0.8"
            android:textStyle="bold" />

    </LinearLayout>
  </ScrollView>
</LinearLayout>
```

Output:

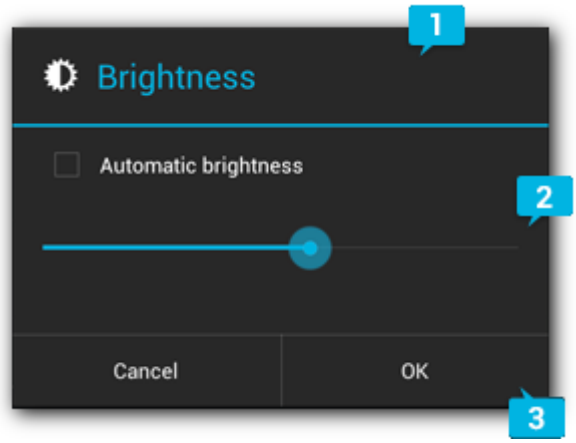
PRACTICAL 6

Aim: Programming menus, dialog, dialog fragments

Alert:

```
val alertDialog: AlertDialog? = activity?.let {
    val builder = AlertDialog.Builder(it)
    builder.apply {
        setPositiveButton(R.string.ok,
            DialogInterface.OnClickListener { dialog, id ->
                // User clicked OK button
            })
        setNegativeButton(R.string.cancel,
            DialogInterface.OnClickListener { dialog, id ->
                // User cancelled the dialog
            })
    }
    // Set other dialog properties
    ...

    // Create the AlertDialog
    builder.create()
}
```

output:



Menu:

menu.xml:

```
<?xml version=”1.0″ encoding=”utf-8″?>
<menu xmlns:android=”http://schemas.android.com/apk/res/android&#8221;
xmlns:app=”http://schemas.android.com/apk/res-auto”&gt;

<item
android:id=”@+id/menu_1″
android:icon=”@drawable/ic_menu_1″
android:title=”Menu 1″
app:showAsAction=”always” />

<item
android:id=”@+id/menu_2″
android:icon=”@drawable/ic_menu_2″
android:title=”Menu 2″ />

<item
android:id=”@+id/menu_3″
android:icon=”@drawable/ic_menu_3″
android:title=”Menu 3″ />
```

```
<item
android:id=”@+id/menu_4″
android:icon=”@drawable/ic_menu_4″
android:title=”Menu 4″ />

</menu>
```

MainActivity.kt:

```
package rohit.com

import android.os.Bundle
import android.support.v7.app.AppCompatActivity
import android.view.Menu
import android.view.MenuItem
import android.widget.Toast
class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }

    override fun onCreateOptionsMenu(menu: Menu): Boolean {
        menuInflater.inflate(R.menu.main, menu)
        return true
    }

    override fun onOptionsItemSelected(item: MenuItem): Boolean {
        when (item.itemId) {
            R.id.menu_1 -> {
                Toast.makeText(this, “Menu 1 is selected”, Toast.LENGTH_SHORT).show()
                return true
            }
            R.id.menu_2 -> {
                Toast.makeText(this, “Menu 2 is selected”, Toast.LENGTH_SHORT).show()
                return true
            }
            R.id.menu_3 -> {
                Toast.makeText(this, “Menu 3 is selected”, Toast.LENGTH_SHORT).show()
                return true
            }
            R.id.menu_4 -> {
                Toast.makeText(this, “Menu 4 is selected”, Toast.LENGTH_SHORT).show()
                return true
            }
            else -> return super.onOptionsItemSelected(item)
        }
    }
}
```

Output:

PRACTICAL 7

Aim: Programs on Intents, Events Listeners and Adapters

Code:

MainActivity

```
package com.example.a249747_practical4
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        val b2=findViewById<Button>(R.id.b1)
        val name=findViewById<EditText>(R.id.e1)
        val email=findViewById<EditText>(R.id.e2)
        val age=findViewById<EditText>(R.id.e3)
        b2.setOnClickListener {
            val userName=name.text.toString()
            val userEmail=email.text.toString()
            val userAge=age.text.toString()
            val intent= Intent(this,MainActivity2::class.java)
            intent.putExtra("user_name",userName

            )
            intent.putExtra("user_email",userEmail

            )
            intent.putExtra("user_age",userAge

            )

            startActivity(intent)
        }

    }
}
```

MainActivity2

```
package com.example.a249747_practical4
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.widget.TextView
class MainActivity2 : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main2)
        val b2=findViewById<Button>(R.id.b2)
        val result1 =findViewById<TextView>(R.id.t1)
        val result2 =findViewById<TextView>(R.id.t2)
        val result3 =findViewById<TextView>(R.id.t3)
```

```
        val userName=intent.getStringExtra("user_name")
        val userEmail=intent.getStringExtra("user_email")
        val userAge=intent.getStringExtra("user_age")
        result1.text="Hello, $userName"
        result2.text="Your Email: $userEmail"
        result3.text="Your Age: $userAge"
        b2.setOnClickListener {
            val intent=Intent(this,MainActivity::class.java)
            startActivity(intent)
        }
    }
}
```

activity_main

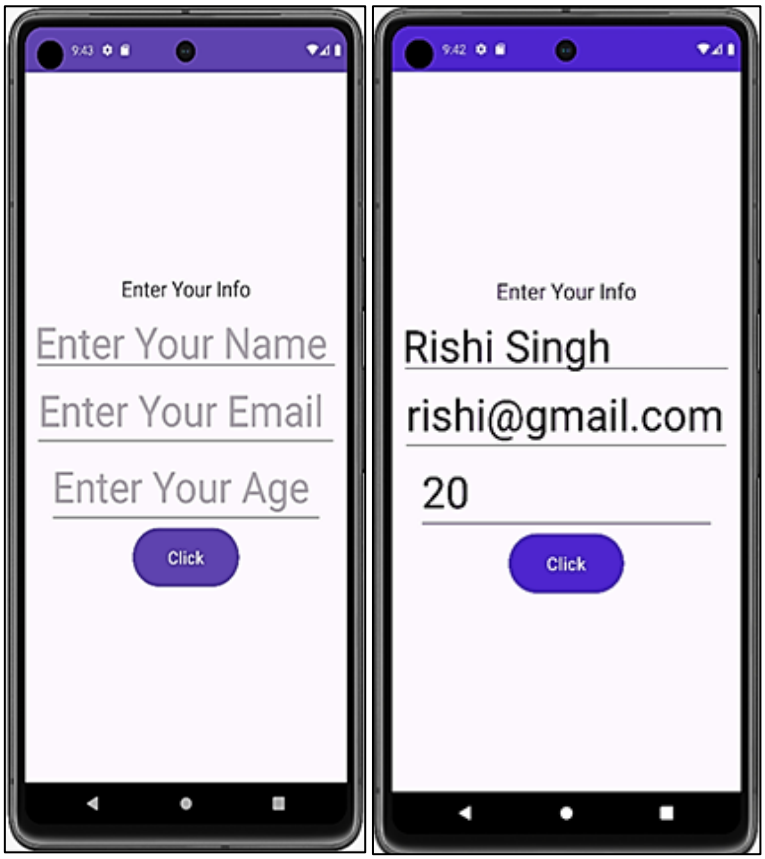
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:orientation="vertical"
    android:gravity="center" >
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:padding="10dp"
        android:text="Enter Your Info"
        android:textSize="25dp">

    </TextView>

    <EditText
        android:id="@+id/e1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:hint="Enter Your Name "
        android:inputType="text"
        android:textSize="50dp"
        android:padding="1dp"/>
    <EditText
        android:id="@+id/e2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:hint="Enter Your Email "
        android:textSize="50dp"
        android:inputType="text"
        />
    <EditText
        android:id="@+id/e3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:hint="Enter Your Age "
        android:textSize="50dp"
        android:inputType="text"
```

```
    />
  <Button
    android:id="@+id/b1"
    android:layout_width="136dp"
    android:layout_height="75dp"
    android:gravity="center"
    android:padding="20dp"
    android:text="Click"
    android:textSize="20dp" />
</LinearLayout>
```

activity_main2

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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=".MainActivity2"
  android:orientation="vertical"
  android:padding="20dp"
  android:gravity="center"

  >
  <TextView
    android:id="@+id/t1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="40dp"  >
  </TextView>
  <TextView
    android:id="@+id/t2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="40dp" >
  </TextView>
  <TextView
    android:id="@+id/t3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="40dp" >
  </TextView>
  <Button
    android:padding="20dp"
    android:id="@+id/b2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Back To Home"
    android:textSize="20dp"/>
</LinearLayout>
```

Output:


Enter Your Info
Enter Your Name
Enter Your Email
Enter Your Age
Click
Enter Your Info
Rishi Singh
rishi@gmail.com
20
Click

PRACTICAL 8

Aim: Programs on Services, notification and broadcast receivers

Code

MyReceiver.kt:

```
package `in`.eyehunt.androidbroadcasts

import android.content.BroadcastReceiver
import android.content.Context
import android.content.Intent
import android.widget.Toast

class MyReceiver : BroadcastReceiver() {

    override fun onReceive(context: Context, intent: Intent) {
        // TODO: This method is called when the BroadcastReceiver is receiving
        // an Intent broadcast.
        Toast.makeText(context, "Broadcast : Flight mode changed.",
                Toast.LENGTH_LONG).show()
    }
}
```

AndroidManifest.xml:

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

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

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

<receiver
android:name=".MyReceiver"
android:enabled="true"
android:exported="true">
<intent-filter>
<action android:name="android.intent.action.AIRPLANE_MODE"/>
</intent-filter>
</receiver>
</application>

</manifest>
```

MainActivity.kt:

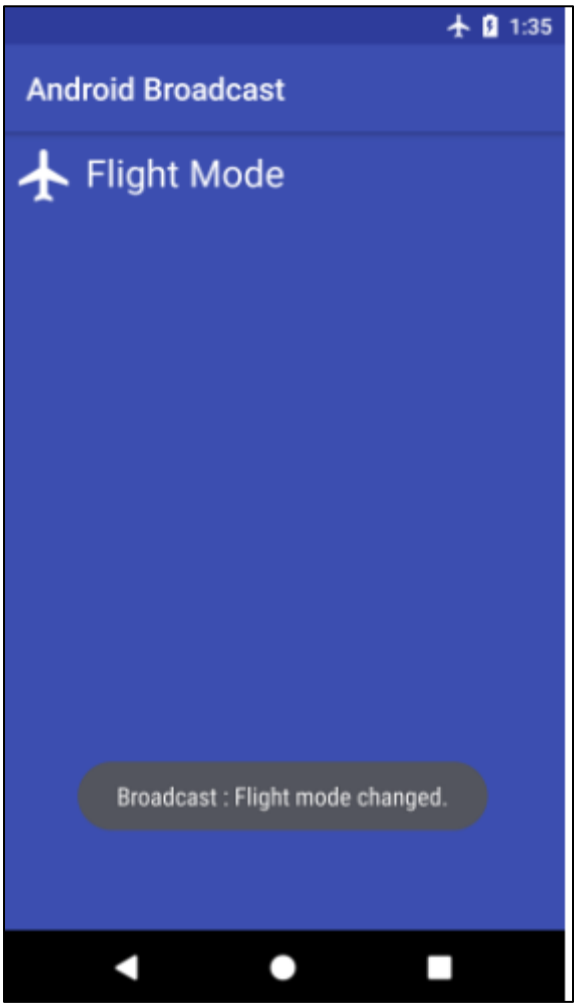
```
package `in`.eyehunt.androidbroadcasts
```

```
import android.support.v7.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}
```

main_activity.xml:

```
<?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"
android:background="@color/colorPrimary"
tools:context="in.eyehunt.androidbroadcasts.MainActivity">

<ImageView
android:id="@+id/imageView"
android:layout_width="40dp"
android:layout_height="40dp"
android:layout_margin="8dp"
android:layout_marginTop="16dp"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:srcCompat="@mipmap/baseline_airplanemode_active_white_24" />

<TextView
android:id="@+id/textView"
android:layout_width="300dp"
android:layout_height="36dp"
android:layout_marginEnd="8dp"
android:layout_marginStart="8dp"
android:gravity="center_vertical"
android:text="Flight Mode"
android:textColor="@color/colorWhite"
android:textSize="24dp"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toEndOf="@+id/imageView"
app:layout_constraintTop_toTopOf="@+id/imageView" />
</android.support.constraint.ConstraintLayout>
```

Output:


1:35
Android Broadcast
Flight Mode
Broadcast : Flight mode changed.

PRACTICAL 9

Aim: a.Database Programming with SQLite
Code:
activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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="wrap_content"
android:orientation="vertical"
android:gravity="center"
tools:context="com.tutorialkart.sqlitetutorial.MainActivity">

<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="SQLite Tutorial - User Management"
android:textSize="20dp"
android:padding="10dp" />

<LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:orientation="vertical">
<EditText
android:id="@+id/edittext_userid"
android:hint="User ID"
android:gravity="center"
android:layout_width="match_parent"
android:layout_height="wrap_content" />
<EditText
android:id="@+id/edittext_name"
android:hint="User Name"
android:gravity="center"
android:layout_width="match_parent"
android:layout_height="wrap_content" />
<EditText
android:id="@+id/edittext_age"
android:hint="User Age"
android:gravity="center"
android:layout_width="match_parent"
android:layout_height="wrap_content" />
</LinearLayout>

<LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:orientation="horizontal">
<Button
android:id="@+id/button_add_user"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_weight="1"
android:onClick="addUser"
android:text="Add" />

<Button
android:id="@+id/button_delete_user"
```

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_weight="1"
android:onClick="deleteUser"
android:text="Delete" />

<Button
android:id="@+id/button_show_all"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_weight="1"
android:onClick="showAllUsers"
android:text="Show All" />
</LinearLayout>
<TextView
android:id="@+id/textview_result"
android:layout_width="match_parent"
android:layout_height="wrap_content" />
<LinearLayout
android:id="@+id/ll_entries"
android:padding="15dp"
android:orientation="vertical"
android:layout_width="match_parent"
android:layout_height="wrap_content"></LinearLayout>
</LinearLayout>
```

UserModel.kt:

```
package com.tutorialkart.sqlitetutorial
class UserModel(val userid: String, val name: String, val age: String)
```

DBContract.kt

```
package com.tutorialkart.sqlitetutorial
import android.provider.BaseColumns
object DBContract {
    /* Inner class that defines the table contents */
    class UserEntry : BaseColumns {
        companion object {
            val TABLE_NAME = "users"
            val COLUMN_USER_ID = "userid"
            val COLUMN_NAME = "name"
            val COLUMN_AGE = "age"
        }
    }
}
```

UserDBHelper.kt:

```
package com.tutorialkart.sqlitetutorial
import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteConstraintException
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteException
import android.database.sqlite.SQLiteOpenHelper
import java.util.ArrayList
class UsersDBHelper(context: Context) : SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {
    override fun onCreate(db: SQLiteDatabase) {
        db.execSQL(SQL_CREATE_ENTRIES)
    }
```

```
    override fun onUpgrade(db: SQLiteDatabase, oldVersion: Int, newVersion: Int) {
        // This database is only a cache for online data, so its upgrade policy is
        // to simply to discard the data and start over
        db.execSQL(SQL_DELETE_ENTRIES)
        onCreate(db)
    }

    override fun onDowngrade(db: SQLiteDatabase, oldVersion: Int, newVersion: Int) {
        onUpgrade(db, oldVersion, newVersion)
    }

    @Throws(SQLiteConstraintException::class)
    fun insertUser(user: UserModel): Boolean {
        // Gets the data repository in write mode
        val db = writableDatabase

        // Create a new map of values, where column names are the keys
        val values = ContentValues()
        values.put(DBContract.UserEntry.COLUMN_USER_ID, user.userid)
        values.put(DBContract.UserEntry.COLUMN_NAME, user.name)
        values.put(DBContract.UserEntry.COLUMN_AGE, user.age)

        // Insert the new row, returning the primary key value of the new row
        val newRowId = db.insert(DBContract.UserEntry.TABLE_NAME, null, values)

        return true
    }

    @Throws(SQLiteConstraintException::class)
    fun deleteUser(userid: String): Boolean {
        // Gets the data repository in write mode
        val db = writableDatabase
        // Define 'where' part of query.
        val selection = DBContract.UserEntry.COLUMN_USER_ID + " LIKE ?"
        // Specify arguments in placeholder order.
        val selectionArgs = arrayOf(userid)
        // Issue SQL statement.
        db.delete(DBContract.UserEntry.TABLE_NAME, selection, selectionArgs)

        return true
    }

    fun readUser(userid: String): ArrayList<UserModel> {
        val users = ArrayList<UserModel>()
        val db = writableDatabase
        var cursor: Cursor? = null
        try {
            cursor = db.rawQuery("select * from " + DBContract.UserEntry.TABLE_NAME + " WHERE " +
DBContract.UserEntry.COLUMN_USER_ID + "='" + userid + "'", null)
        } catch (e: SQLiteException) {
            // if table not yet present, create it
            db.execSQL(SQL_CREATE_ENTRIES)
            return ArrayList()
        }

        var name: String
        var age: String
        if (cursor!!.moveToFirst()) {
            while (cursor.isAfterLast == false) {
```

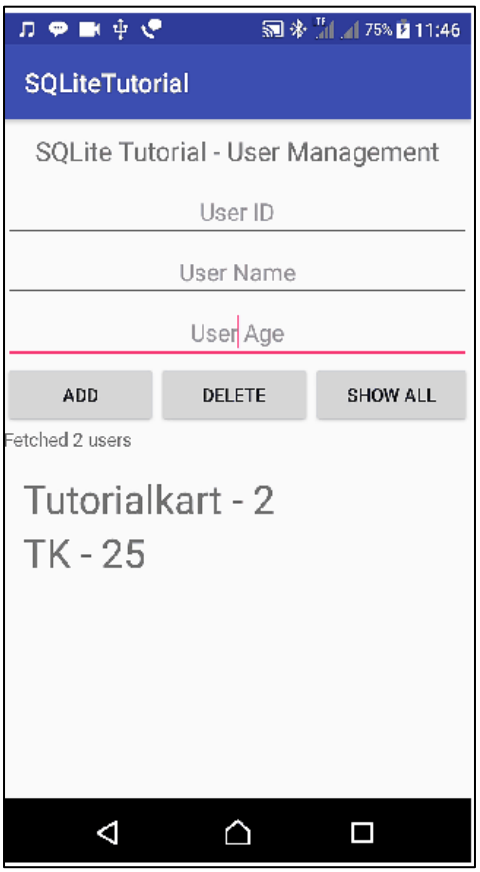
```
            name = cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_NAME))
            age = cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_AGE))

            users.add(UserModel(userid, name, age))
            cursor.moveToNext()
        }
    }
    return users
}

fun readAllUsers(): ArrayList<UserModel> {
    val users = ArrayList<UserModel>()
    val db = writableDatabase
    var cursor: Cursor? = null
    try {
        cursor = db.rawQuery("select * from " + DBContract.UserEntry.TABLE_NAME, null)
    } catch (e: SQLiteException) {
        db.execSQL(SQL_CREATE_ENTRIES)
        return ArrayList()
    }

    var userid: String
    var name: String
    var age: String
    if (cursor!!.moveToFirst()) {
        while (cursor.isAfterLast == false) {
            userid = cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_USER_ID))
            name = cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_NAME))
            age = cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_AGE))

            users.add(UserModel(userid, name, age))
            cursor.moveToNext()
        }
    }
    return users
}

companion object {
    // If you change the database schema, you must increment the database version.
    val DATABASE_VERSION = 1
    val DATABASE_NAME = "FeedReader.db"

    private val SQL_CREATE_ENTRIES =
        "CREATE TABLE " + DBContract.UserEntry.TABLE_NAME + " (" +
                DBContract.UserEntry.COLUMN_USER_ID + " TEXT PRIMARY KEY," +
                DBContract.UserEntry.COLUMN_NAME + " TEXT," +
                DBContract.UserEntry.COLUMN_AGE + " TEXT)"

    private val SQL_DELETE_ENTRIES = "DROP TABLE IF EXISTS " + DBContract.UserEntry.TABLE_NAME
}

}
```

MainActivity.kt:

```
package com.tutorialkart.sqlitetutorial

import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import android.view.View
import android.widget.TextView
```

```
import kotlinx.android.synthetic.main.activity_main.*

class MainActivity : AppCompatActivity() {

    lateinit var usersDBHelper : UsersDBHelper

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        usersDBHelper = UsersDBHelper(this)
    }

    fun addUser(v:View){
        var userid = this.edittext_userid.text.toString()
        var name = this.edittext_name.text.toString()
        var age = this.edittext_age.text.toString()
        var result = usersDBHelper.insertUser(UserModel(userid = userid,name = name,age = age))
        //clear all edittext s
        this.edittext_age.setText("")
        this.edittext_name.setText("")
        this.edittext_userid.setText("")
        this.textview_result.text = "Added user : "+result
        this.ll_entries.removeAllViews()
    }

    fun deleteUser(v:View){
        var userid = this.edittext_userid.text.toString()
        val result = usersDBHelper.deleteUser(userid)
        this.textview_result.text = "Deleted user : "+result
        this.ll_entries.removeAllViews()
    }

    fun showAllUsers(v:View){
        var users = usersDBHelper.readAllUsers()
        this.ll_entries.removeAllViews()
        users.forEach {
            var tv_user = TextView(this)
            tv_user.textSize = 30F
            tv_user.text = it.name.toString() + " - " + it.age.toString()
            this.ll_entries.addView(tv_user)
        }
        this.textview_result.text = "Fetched " + users.size + " users"
    }
}
```

Output:


11:46
SQLiteTutorial
SQLite Tutorial - User Management
User ID
User Name
User Age
ADD
DELETE
SHOW ALL
Fetched 2 users
Tutorialkart - 2
TK - 25

Aim: b.Programming Network Communications and Services (JSON)

Code:

Main Activity.java

```
package com.example.myapplication;
import android.os.AsyncTask;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.ListView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {
private static final String API_URL = "https://jsonplaceholder.typicode.com/users"; // Sample API
private ListView listView;
private ArrayList<String> userList;
private ArrayAdapter<String> adapter;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
listView = findViewById(R.id.list_view);
Button fetchButton = findViewById(R.id.btn_fetch);
userList = new ArrayList<>();
adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, userList);
listView.setAdapter(adapter);
fetchButton.setOnClickListener(v -> new FetchDataTask().execute(API_URL));
}
// AsyncTask to Fetch JSON Data
private class FetchDataTask extends AsyncTask<String, Void, String> {
@Override
protected String doInBackground(String... urls) {
StringBuilder result = new StringBuilder();
try {
URL url = new URL(urls[0]);
HttpURLConnection connection = (HttpURLConnection) url.openConnection();
connection.setRequestMethod("GET");
BufferedReader reader = new BufferedReader(new InputStreamReader(connection.getInputStream()));
String line;
while ((line = reader.readLine()) != null) {
result.append(line);
}
reader.close();
} catch (Exception e) {
Log.e("NetworkError", "Error fetching data", e);
```

```
return null;
}
return result.toString();
}
@Override
protected void onPostExecute(String json) {
if (json != null) {
parseJSON(json);
} else {
Toast.makeText(MainActivity.this, "Failed to fetch data", Toast.LENGTH_SHORT).show();
}
}
}
private void parseJSON(String json) {
userList.clear();
try {
JSONArray jsonArray = new JSONArray(json);
for (int i = 0; i < jsonArray.length(); i++) {
JSONObject user = jsonArray.getJSONObject(i);
String name = user.getString("name");
String email = user.getString("email");
userList.add(name + " - " + email); }
adapter.notifyDataSetChanged();
} catch (JSONException e) {
Log.e("JSONError", "Error parsing JSON", e);
Toast.makeText(this, "Error parsing JSON", Toast.LENGTH_SHORT).show();
}}}
```

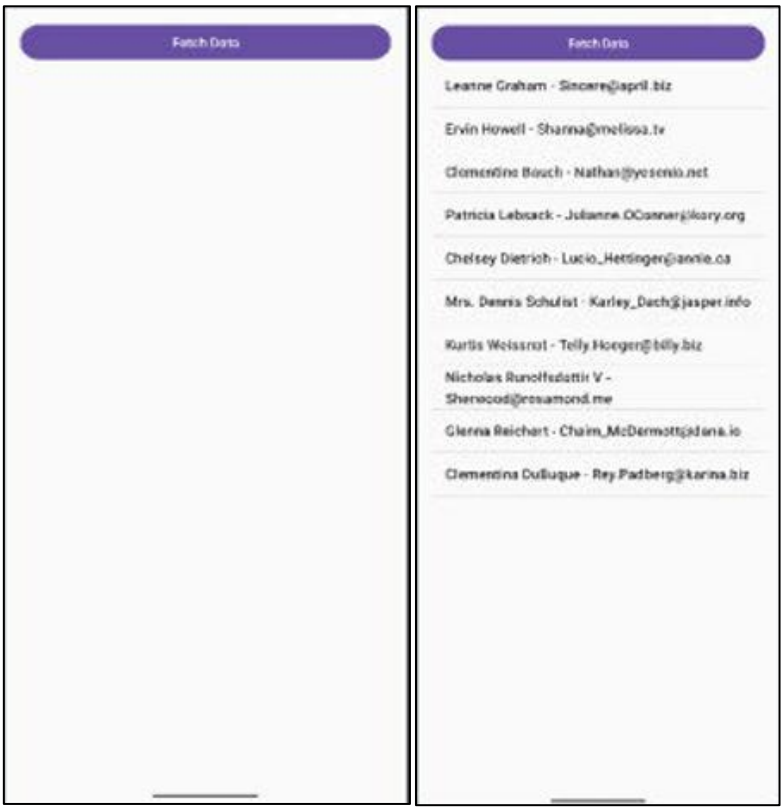
activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:orientation="vertical"
android:padding="16dp"
android:background="#FAFAFA">
<Button
android:id="@+id/btn_fetch"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="Fetch Data" />
<ListView
 android:id="@+id/list_view"
android:layout_width="match_parent"
android:layout_height="match_parent" />
</LinearLayout>
```

AndroidManifest.xml

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

Output:


Fetch Data
Fetch Data
Leanne Graham - Sincere@april.biz
Ervin Howell - Shanna@melissa.tv
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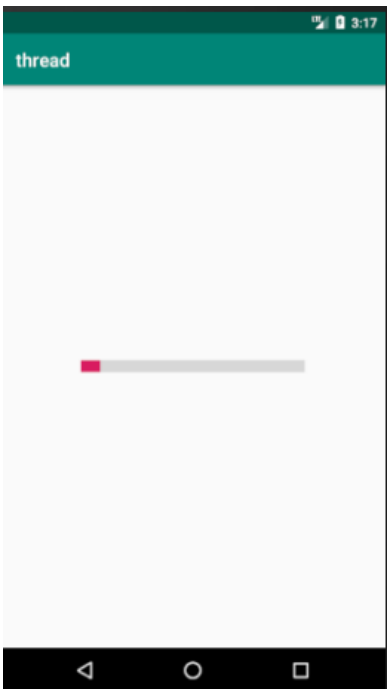
PRACTICAL 10

Aim: Programming threads, handles and asynchronized programs Threads and Handers

Code:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android" xmlns:tools="http://schemas.android.com/tools"

xmlns:app="http://schemas.android.com/apk/res-auto" android:layout_width="match_parent"

android:layout_height="match_parent" tools:context=".MainActivity">

<ProgressBar
android:layout_width="wrap_content"
android:layout_height="wrap_content" style="?android:attr/progressBarStyleHorizontal"

android:layout_centerInParent="true" android:max="50"

android:maxWidth="100dp" android:scaleX="5" android:scaleY="3" android:id="@+id/progressBar"/>

</RelativeLayout>
Mainactivity.kt
package com.example.thread

import android.support.v7.app.AppCompatActivity import android.os.Bundle

import android.os.Handler
import kotlinx.android.synthetic.main.activity_main.* import java.lang.Exception


class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState)

    setContentView(R.layout.activity_main)

var currpos=0
var handler=Handler()
var thread=Thread(object :Runnable { override fun run() {

for ( i in 1..50)
{
currpos=i try {

Thread.sleep(1000)
}
catch (e:Exception)
{

}
handler.post(object :Runnable{ override fun run() {

progressBar.progress = currpos }})}}})
thread.start()
}}
```

Output:



Asynchronized Programs

Activitymain.xml

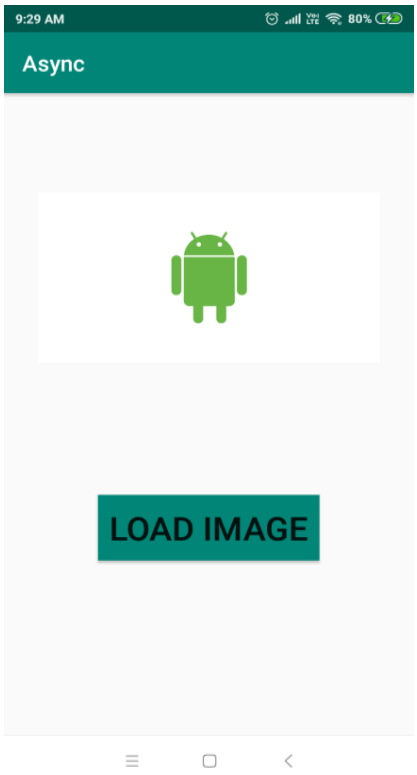
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android" xmlns:tools="http://schemas.android.com/tools"

xmlns:app="http://schemas.android.com/apk/res-auto" android:layout_width="match_parent"

android:layout_height="match_parent" tools:context=".MainActivity">

<ImageView
android:layout_width="300dp" android:layout_height="300dp" android:id="@+id/img"

android:layout_marginTop="20dp" android:layout_alignParentTop="true" android:layout_centerHorizontal="true"

/>
<Button
android:id="@+id/btn" android:layout_width="wrap_content" android:layout_height="wrap_content"

android:layout_below="@+id/img" android:layout_marginTop="50dp" android:layout_centerInParent="true"

android:background="@color/colorPrimary" android:text="Load Image" android:padding="10dp"

android:textSize="30dp" android:onClick="download"

/>
</RelativeLayout>
```

Mainactivty.kt

```
package com.example.user.async
import android.graphics.Bitmap
import android.graphics.BitmapFactory import android.os.AsyncTask

import android.support.v7.app.AppCompatActivity import android.os.Bundle

import android.view.View
import kotlinx.android.synthetic.main.activity_main.* import java.lang.Exception

import java.net.URL
class MainActivity : AppCompatActivity() { lateinit var url:String

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState)

    setContentView(R.layout.activity_main)

}
fun download(view: View){ url="https://www.android.com/static/2016/img/share/andy-lg.png" var

    a=downloadimage().execute(url)

}
inner class downloadimage:AsyncTask<String,Int,Bitmap>(){ override fun doInBackground(vararg params: String?):

    Bitmap? {

 var img:Bitmap?=null try {

var url = URL(params[0])
var inputStream = url.openStream()
img= BitmapFactory.decodeStream(inputStream)
}
catch (e:Exception){ e.printStackTrace()
```

```
}
return img
}
override fun onPostExecute(result: Bitmap?) { img.setImageBitmap(result) super.onPostExecute(result)

}}}
```

Output:



Practical No.11

Aim: a.Programming Media API and Telephone API

Programming Media API Code:

Activity_main.xml

```
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android" xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".MainActivity">
<Button
android:layout_width="wrap_content" android:layout_height="wrap_content" android:id="@+id/audio"
android:layout_alignParentTop="true" android:text="Audio" android:background="@color/colorPrimary"
android:layout_centerHorizontal="true" android:layout_marginTop="150dp" android:onClick="audio"
/>
<Button
android:layout_width="wrap_content" android:layout_height="wrap_content" android:id="@+id/video"
android:text="video" android:background="@color/colorPrimary" android:layout_centerHorizontal="true"
android:layout_below="@+id/audio" android:layout_marginTop="60dp" android:onClick="video"
/>
</RelativeLayout>
```

activity_audio.xml

```
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android" xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".Audio">
<SeekBar
android:layout_width="match_parent" android:layout_height="wrap_content" android:id="@+id/audiobar"
android:layout_alignParentTop="true" android:layout_marginTop="130dp"/>
<Button
android:id="@+id/play" android:layout_width="wrap_content" android:layout_height="wrap_content"
android:text="Play" android:background="@color/colorPrimary" android:layout_below="@id/audiobar"
android:layout_alignParentLeft="true" android:layout_marginLeft="40dp" android:layout_marginTop="150dp"
android:layout_marginRight="70dp" android:onClick="play"
/>
<Button
android:id="@+id/stop" android:layout_width="wrap_content" android:layout_height="wrap_content"
android:text="Stop" android:background="@color/colorPrimary" android:layout_below="@id/audiobar"
android:layout_alignParentRight="true" android:layout_toRightOf="@+id/play" android:layout_marginRight="40dp"
android:layout_marginLeft="70dp"
android:layout_marginTop="150dp" android:onClick="stop"
/>
<Button
android:id="@+id/back" android:layout_width="wrap_content" android:layout_height="wrap_content"
android:text="BACK" android:background="@color/colorPrimary" android:layout_below="@+id/play"
android:layout_marginTop="50dp" android:layout_centerHorizontal="true" android:onClick="back"
/>
</RelativeLayout>
```

Audio.kt

```
class Audio : AppCompatActivity() { lateinit var mediaPlayer: MediaPlayer lateinit var handler: Handler
lateinit var runnable: Runnable @RequiresApi(Build.VERSION_CODES.LOLLIPOP) override fun
onCreate(savedInstanceState: Bundle?) {
super.onCreate(savedInstanceState) setContentView(R.layout.activity_audio)
mediaPlayer = MediaPlayer.create(applicationContext, R.raw.audioringtone) var attributes =
AudioAttributes.Builder()
.setContentType(AudioAttributes.CONTENT_TYPE_MUSIC)
    .build() mediaPlayer.setAudioAttributes(attributes) handler = Handler()
mediaPlayer.setOnPreparedListener(object : MediaPlayer.OnPreparedListener { override fun onPrepared(mp:
    MediaPlayer?) {
audiobar.max = mediaPlayer.duration changeprogress()
mediaPlayer.start()

} })
        audiobar.setOnSeekBarChangeListener(object : SeekBar.OnSeekBarChangeListener {
            override fun onProgressChanged(seekBar: SeekBar?, progress: Int, input: Boolean) {
// Toast.makeText(applicationContext,progress.toString(),Toast.LENGTH_SHORT).show ()
if (input) { mediaPlayer.seekTo(progress)
}
}
override fun onStartTrackingTouch(seekBar: SeekBar?) {
}
override fun onStopTrackingTouch(seekBar: SeekBar?) {
}
}) }
fun changeprogress() {
audiobar.progress = mediaPlayer.currentPosition if (mediaPlayer.isPlaying) {
runnable = Runnable { changeprogress()
}
handler.postDelayed(runnable,  1000) }
}
fun play(view: View) {
audiobar.progress = mediaPlayer.currentPosition mediaPlayer.start()
}
fun stop(view: View) { mediaPlayer.pause()
}
fun back(view:View){ startActivity(Intent(this,MainActivity::class.java))
}

override fun onResume() { super.onResume() mediaPlayer.start()
audiobar.progress = mediaPlayer.currentPosition
}
override fun onPause() { super.onPause() mediaPlayer.pause()
}
override fun onDestroy() { super.onDestroy() mediaPlayer.release() handler.removeCallbacks(runnable)
}
```

}

activity_video.xml

```
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android" xmlns:tools="http://schemas.android.com/tools"
xmlns:app="http://schemas.android.com/apk/res-auto" android:layout_width="match_parent"
android:layout_height="match_parent"  tools:context=".video">

<VideoView
android:layout_width="match_parent" android:layout_height="match_parent" android:id="@+id/videoView"/>
</RelativeLayout>
```

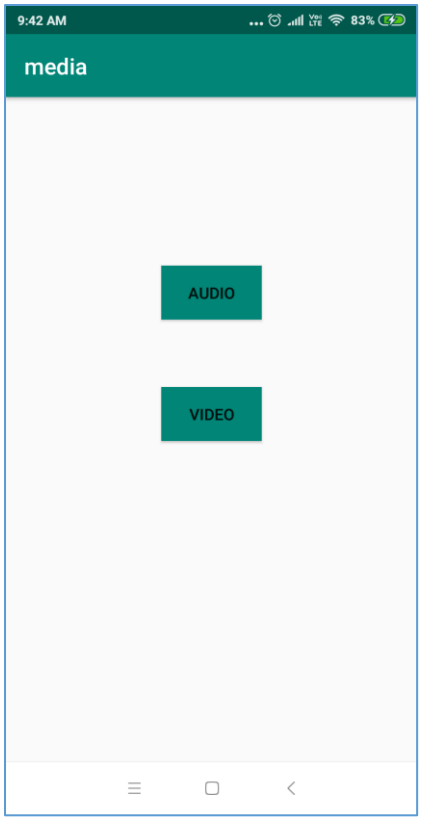
video.kt

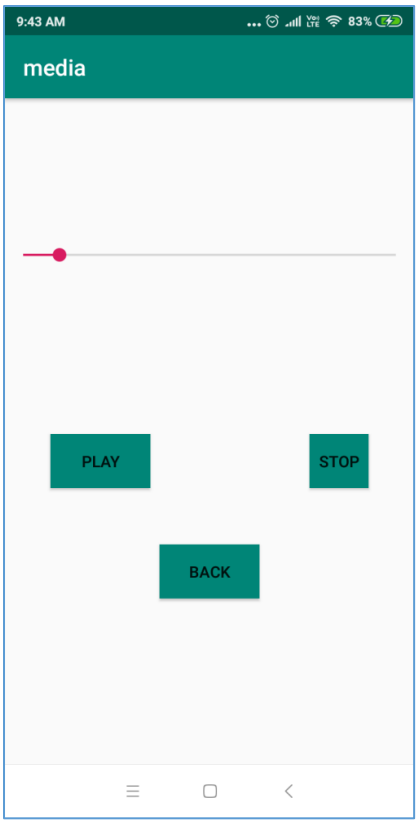
```
class video : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_video)
var mediaController=MediaController(this) var
path="android.resource://com.example.admin.asynchronousexample/${R.raw.videopla yback}"
var uri= Uri.parse(path) videoView.setVideoURI(uri) mediaController.setAnchorView(videoView)
videoView.setMediaController(mediaController) videoView.start()
}
}
```

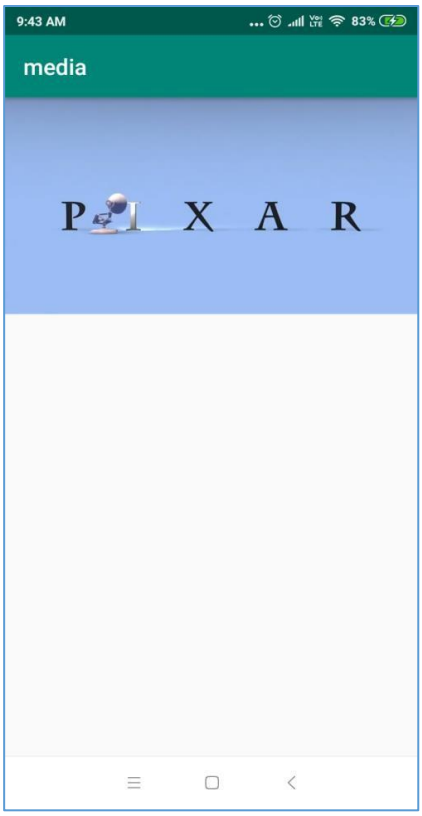
MainActivity.kt

```
class MainActivity : AppCompatActivity()
{
override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
}
fun audio(view: View){
var intent= Intent(this,Audio::class.java) startActivity(intent)
}
fun video(view:View){
var intent= Intent(this,video::class.java) startActivity(intent)
}
}
```

Output:


9:42 AM
83%
media
AUDIO
VIDEO


9:43 AM
83%
media
PLAY
STOP
BACK


9:43 AM
83%
media
PIXAR

Telephone API Code:

Add the follwing permissions in androidmanifest.xml file in the manifest tag

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

Activity_main.xml

```
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android" xmlns:tools="http://schemas.android.com/tools"
xmlns:app="http://schemas.android.com/apk/res-auto" android:layout_width="match_parent"
android:layout_height="match_parent" tools:context=".MainActivity">
<TextView
android:layout_width="match_parent" android:layout_height="wrap_content" android:id="@+id/title"
android:text="Click on number to make a call" android:textSize="25sp" android:textAlignment="center"
android:textStyle="bold"
/>
<ListView
android:id="@+id/contacts" android:layout_width="match_parent" android:layout_height="match_parent"
android:layout_below="@+id/title"
>
</ListView>
</RelativeLayout>
```

Create a new xml resource file for inflating in listadapter and rename it (contact_data.xml)

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android" android:orientation="vertical"
android:layout_width="match_parent" android:layout_height="match_parent">
<TextView
android:id="@+id/cdata" android:layout_width="match_parent" android:layout_height="wrap_content"
android:textSize="25sp"/>
</LinearLayout>
```

Create a model class from storing the contact details like name,phone number etc

contact.kt

```
class contact {
var pno:String?=null var name:String?=null fun getContact():String
{
return "$name \n$pno"
}
}
```

Create a listadapter class for storing the contact details in list

listadapter.kt

```
class listadapter(var activity:Activity, var contactlist:ArrayList<contact>):BaseAdapter(){ override fun
    getView(position: Int, convertView: View?, parent: ViewGroup?): View {
var inflater=LayoutInflater.from(activity)
var view=inflater.inflate(R.layout.contact_data,null) view.cdata.text=contactlist[position].getContact()
view.setOnClickListener {
var alertDialog=AlertDialog.Builder(activity) alertDialog.setTitle("Make a call")
```

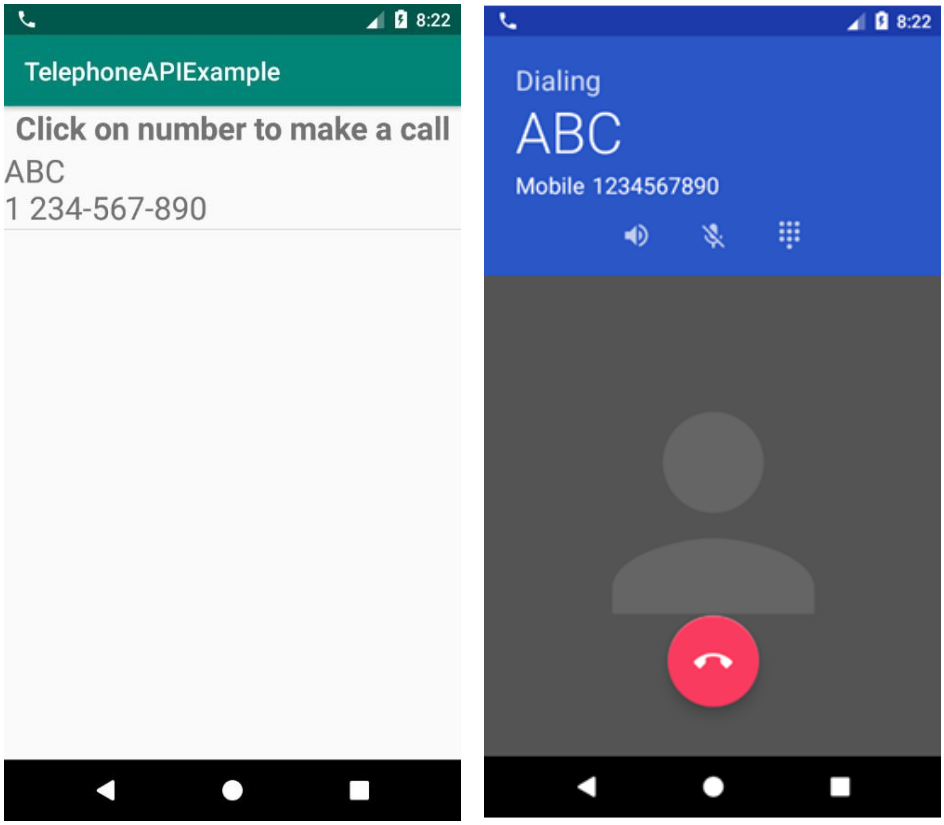
```
alertDialog.setMessage("to:${contactlist[position].name}\n${contactlist[position].pno}")

            alertDialog.setPositiveButton("Yes",DialogInterface.OnClickListener {

    dialog, which -> try {

var intent = Intent(Intent.ACTION_CALL)
intent.data = Uri.parse("tel:${contactlist[position].pno}") activity.startActivity(intent)

}
catch(e:Exception){
Toast.makeText(activity,"Please allow the permission" + "",Toast.LENGTH_SHORT).show()

}
})
            alertDialog.setNegativeButton("No",DialogInterface.OnClickListener { dialog, which ->
dialog.cancel()
})
alertDialog.create() alertDialog.show()

}
return view
}
override fun getItem(position: Int): Any { return contactlist[position]

}
override fun getItemId(position: Int): Long { return position.toLong()

}
override fun getCount(): Int { return contactlist.size

}
}
```

MainActivity.kt

```
class MainActivity : AppCompatActivity() { lateinit var adapter:listadapter lateinit var contactList:ArrayList<contact>

    var cursor: Cursor?=null

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState)

    setContentView(R.layout.activity_main)

        var permissionCode1= ContextCompat.checkSelfPermission(this, Manifest.permission.READ_CONTACTS)
        var permissionCode2= ContextCompat.checkSelfPermission(this, Manifest.permission.CALL_PHONE)
        if(permissionCode1==PackageManager.PERMISSION_GRANTED &&
permissionCode2==PackageManager.PERMISSION_GRANTED)
{
showContacts()
}
else{
            ActivityCompat.requestPermissions(this,
arrayOf(Manifest.permission.READ_CONTACTS,Manifest.permission.CALL_PHONE), 100)
}
adapter= listadapter(this,contactList) contacts.adapter=adapter
}
    override fun onRequestPermissionsResult(requestCode: Int, permissions: Array<out String>, grantResults:
IntArray) {
super.onRequestPermissionsResult(requestCode, permissions, grantResults) if(requestCode==100){
```

```
showContacts()
}
else{
        Toast.makeText(this,"Please Provide the Contact permission",Toast.LENGTH_SHORT).show()
}
}
private fun showContacts() {

cursor=contentResolver.query(ContactsContract.CommonDataKinds.Phone.CONTEN T_URI,
    null,null,null,ContactsContract.Contacts.SORT_KEY_PRIMARY ) contactList=ArrayList<contact>()

var number: String?
var lastnumber:String?=null while(cursor!!.moveToNext())

{
number=(cursor!!.getString(cursor!!.getColumnIndex(ContactsContract.CommonDataKi nds.Phone.NUMBER)))
if(number!=null ) { number=number.replace("\\s".toRegex(),"") if (!number!!.equals(lastnumber)) {

lastnumber = number
var contact = contact() contact.name =

cursor!!.getString(cursor!!.getColumnIndex(ContactsContract.CommonDataKinds.Phon e.DISPLAY_NAME))
            contact.pno = cursor!!.getString(cursor!!.getColumnIndex(ContactsContract.CommonDataKinds.Phon
e.NUMBER))
contactList.add(contact)
}
}
}
cursor!!.close()
}
}
```

Output:


8:22
TelephoneAPIExample
Click on number to make a call
ABC
1 234-567-890
8:22
Dialing
ABC
Mobile 1234567890

Aim: b.Programming Security and permissions
Code:
Extra Packages requied in ManagePermission.kt (Class File)

```
import android.app.Activity
import android.content.pm.PackageManager
import android.support.v4.app.ActivityCompat
import android.support.v4.content.ContextCompat
import android.support.v7.app.AlertDialog
```

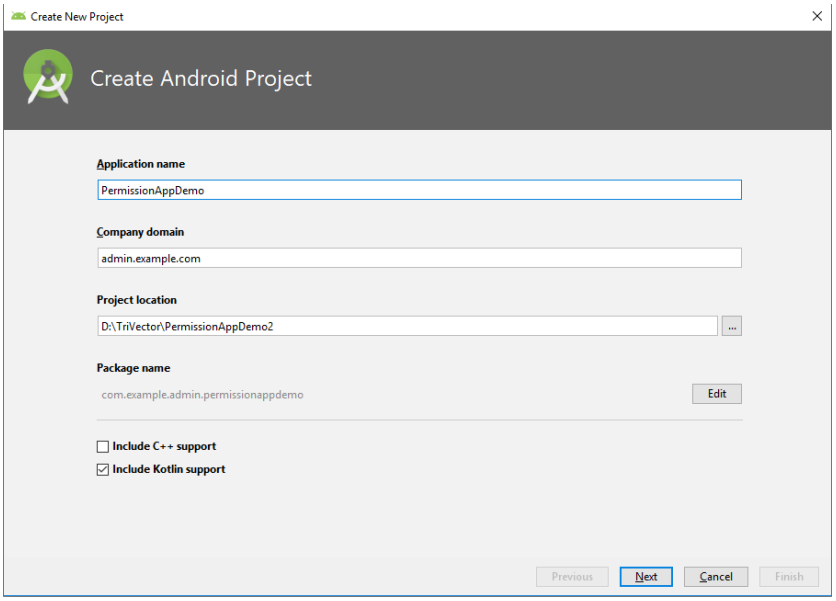
Extra Packages requied in MainActivity.kt

```
import android.Manifest
import android.content.Context
import android.os.Build
import android.widget.Toast
import kotlinx.android.synthetic.main.activity_main.*
```

For Multple Permission Access,need to add following line in class MainActivity

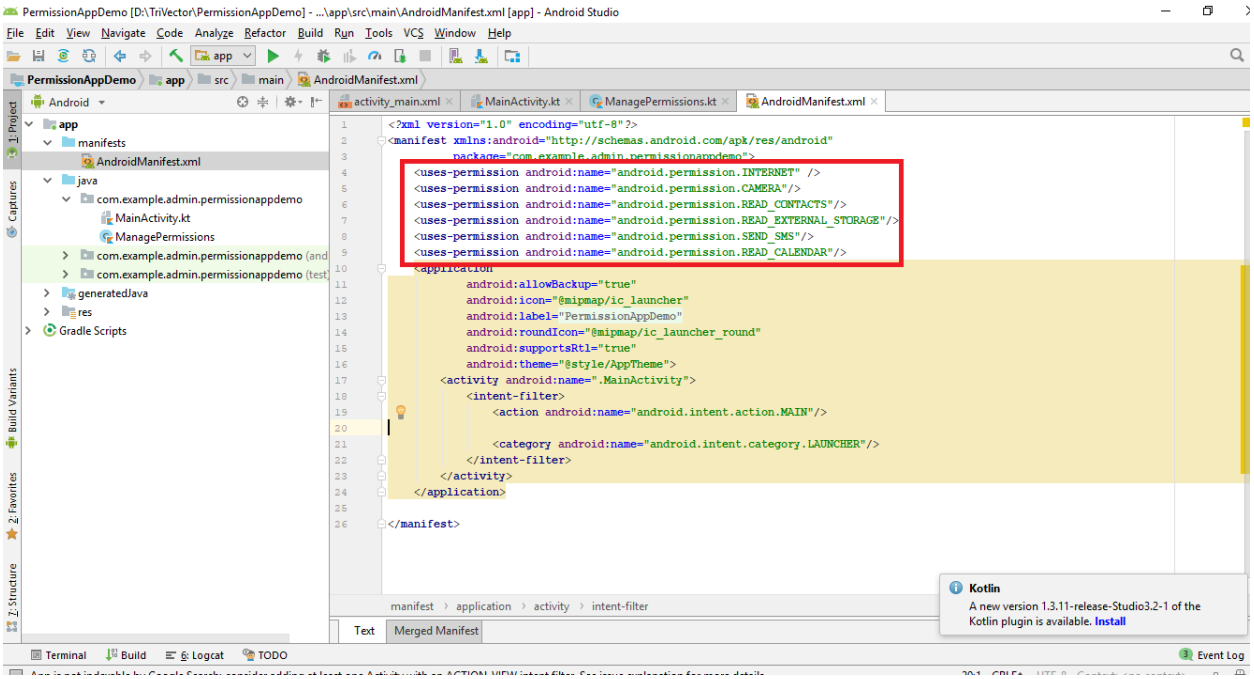
```
private val PermissionsRequestCode = 123
```

1. Create a new project in android studio



2. An app must publicize the permissions it requires by including <uses-permission> tags in the app manifest.

```
<uses-permission android:name="android.permission.INTERNET" />
<uses-permission android:name="android.permission.CAMERA"/>
<uses-permission android:name="android.permission.READ_CONTACTS"/>
<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>
<uses-permission android:name="android.permission.SEND_SMS"/>
<uses-permission android:name="android.permission.READ_CALENDAR"/>
```



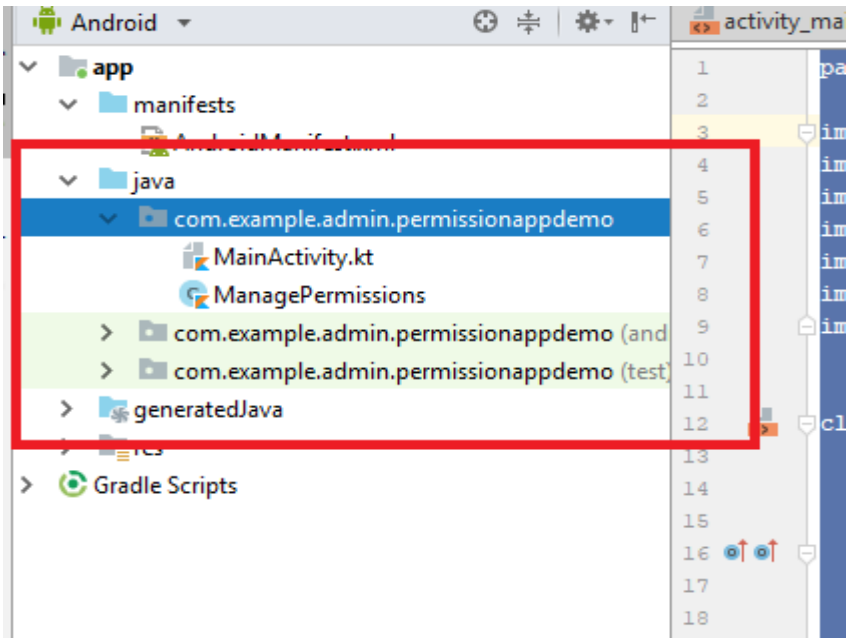
3. MainActivity.kt

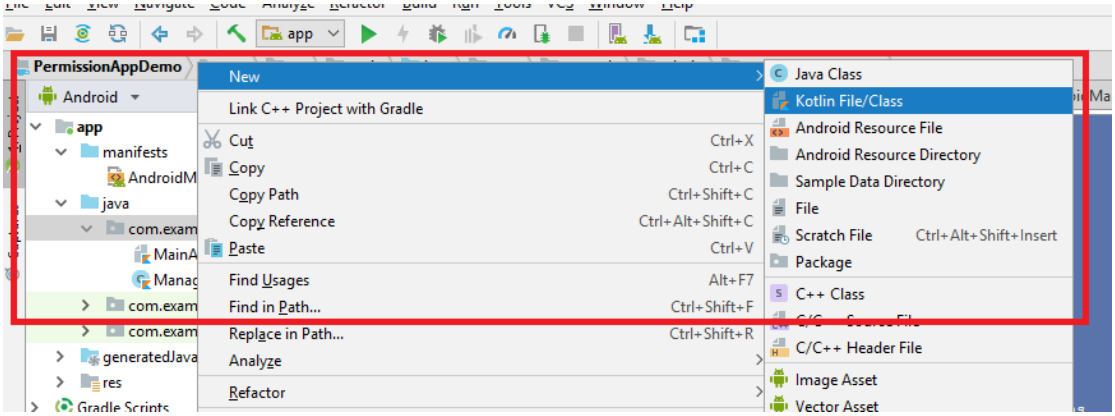
```
package com.example.admin.permissionappdemo

import android.Manifest
import android.content.Context
import android.os.Build
import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import android.widget.Toast
import kotlinx.android.synthetic.main.activity_main.*


class MainActivity : AppCompatActivity() {
    private val PermissionsRequestCode = 123
    private lateinit var managePermissions: ManagePermissions

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Initialize a list of required permissions to request runtime
        val list = listOf<String>(
            Manifest.permission.CAMERA,
            Manifest.permission.READ_CONTACTS,
            Manifest.permission.READ_EXTERNAL_STORAGE,
            Manifest.permission.SEND_SMS,
            Manifest.permission.READ_CALENDAR
        )

        // Initialize a new instance of ManagePermissions class
        managePermissions = ManagePermissions(this,list,PermissionsRequestCode)

        // Button to check permissions states
        button.setOnClickListener{
            if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.M)
                managePermissions.checkPermissions()
        }
    }   // Receive the permissions request result
```

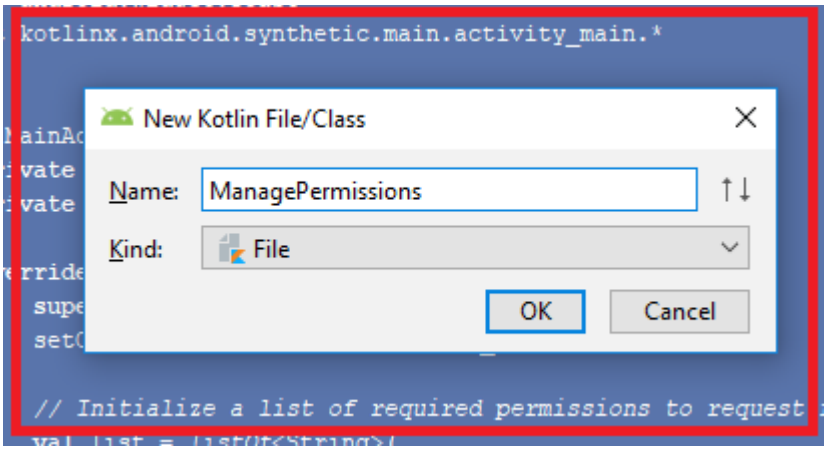
```
    override fun onRequestPermissionsResult(requestCode: Int, permissions: Array<String>,
                                            grantResults: IntArray) {
        when (requestCode) {
            PermissionsRequestCode ->{
                val isPermissionsGranted = managePermissions
                    .processPermissionsResult(requestCode,permissions,grantResults)

                if(isPermissionsGranted){
                    // Do the task now
                    toast("Permissions granted.")
                }else{
                    toast("Permissions denied.")
                }
                return
            }
        }
    }
}


// Extension function to show toast message
fun Context.toast(message: String) {
    Toast.makeText(this, message, Toast.LENGTH_SHORT).show()
}
```

4. Create a New Kotlin Class

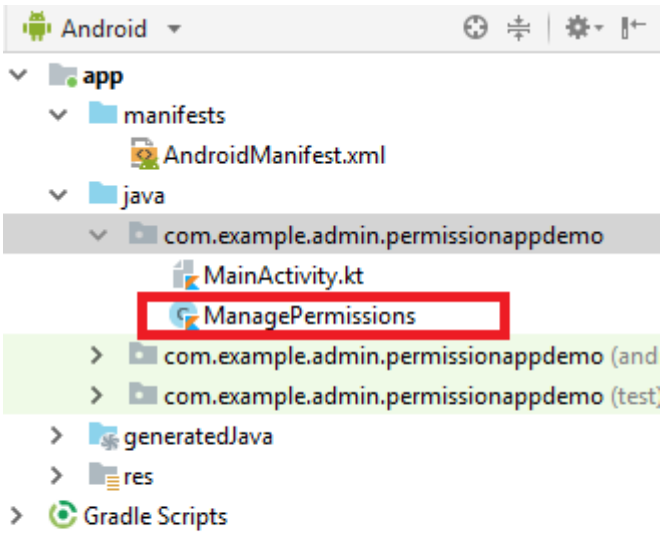
app->src->main->java->com.example.admin.permissionappdemo







Class file is generated

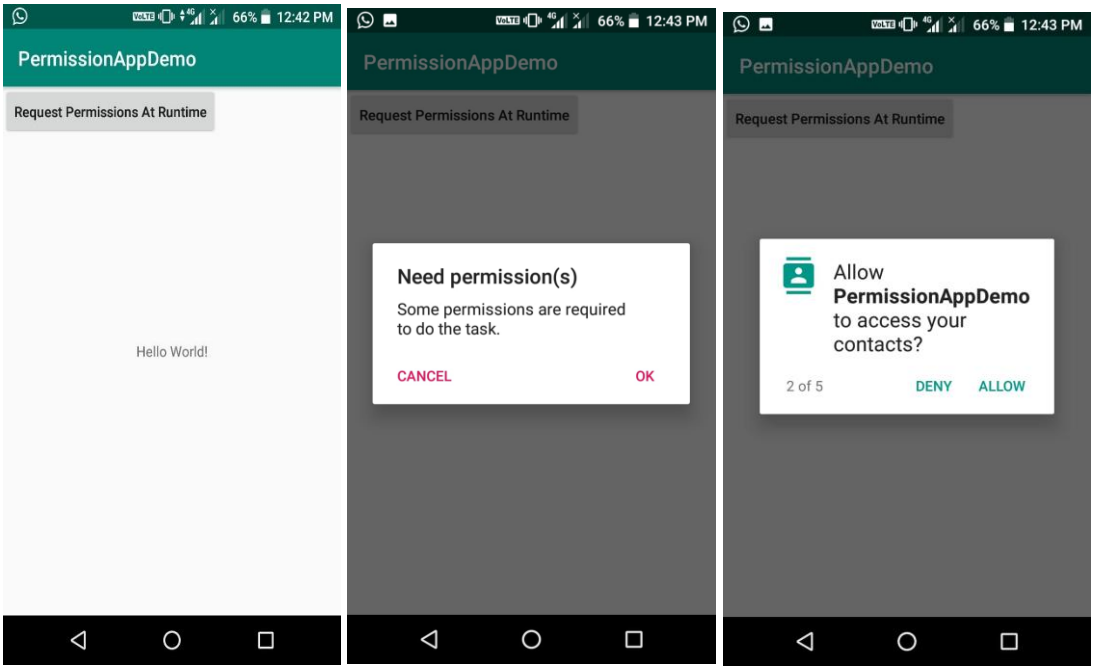


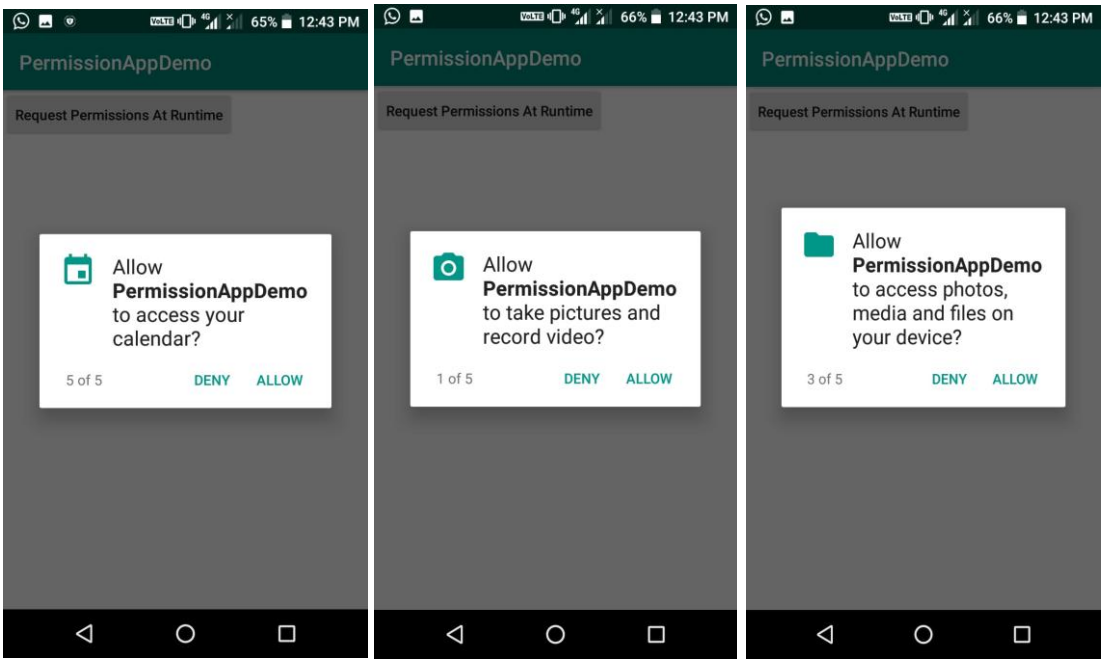
5. Write the following code in the Class File

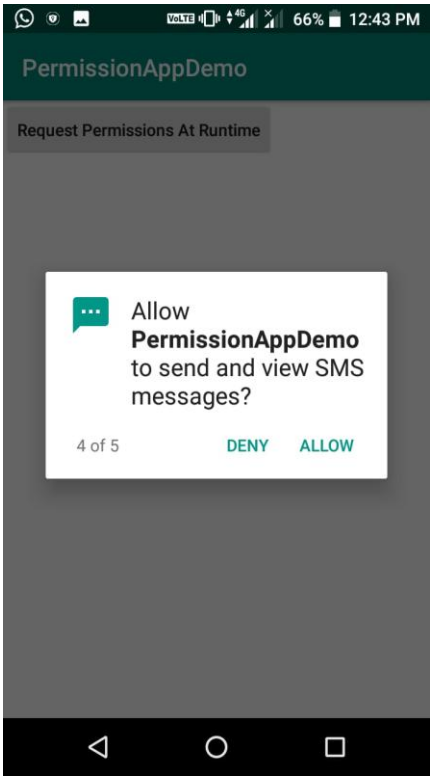
```
import android.app.Activity
import android.content.pm.PackageManager
import android.support.v4.app.ActivityCompat
import android.support.v4.content.ContextCompat
import android.support.v7.app.AlertDialog


class ManagePermissions(val activity: Activity,val list: List<String>,val code:Int) {
```

```
// Check permissions at runtime
fun checkPermissions() {
    if (isPermissionsGranted() != PackageManager.PERMISSION_GRANTED) {
        showAlert()
    } else {
        activity.toast("Permissions already granted.")
    }
}

// Check permissions status
private fun isPermissionsGranted(): Int {
    // PERMISSION_GRANTED : Constant Value: 0
    // PERMISSION_DENIED : Constant Value: -1
    var counter = 0;
    for (permission in list) {
        counter += ContextCompat.checkSelfPermission(activity, permission)
    }
    return counter
}

// Find the first denied permission
private fun deniedPermission(): String {
    for (permission in list) {
        if (ContextCompat.checkSelfPermission(activity, permission)
            == PackageManager.PERMISSION_DENIED) return permission
    }
    return ""
}

// Show alert dialog to request permissions
private fun showAlert() {
    val builder = AlertDialog.Builder(activity)
    builder.setTitle("Need permission(s)")
    builder.setMessage("Some permissions are required to do the task.")
    builder.setPositiveButton("OK", { dialog, which -> requestPermissions() })
    builder.setNeutralButton("Cancel", null)
    val dialog = builder.create()
    dialog.show()
}

// Request the permissions at run time
private fun requestPermissions() {
    val permission = deniedPermission()
    if (ActivityCompat.shouldShowRequestPermissionRationale(activity, permission)) {
        // Show an explanation asynchronously
        activity.toast("Should show an explanation.")
    } else {
        ActivityCompat.requestPermissions(activity, list.toTypedArray(), code)
    }
}

// Process permissions result
fun processPermissionsResult(requestCode: Int, permissions: Array<String>,
                             grantResults: IntArray): Boolean {
    var result = 0
    if (grantResults.isNotEmpty()) {
        for (item in grantResults) {
            result += item
        }
```

```
        }
        if (result == PackageManager.PERMISSION_GRANTED) return true
        return false
    }
}
```



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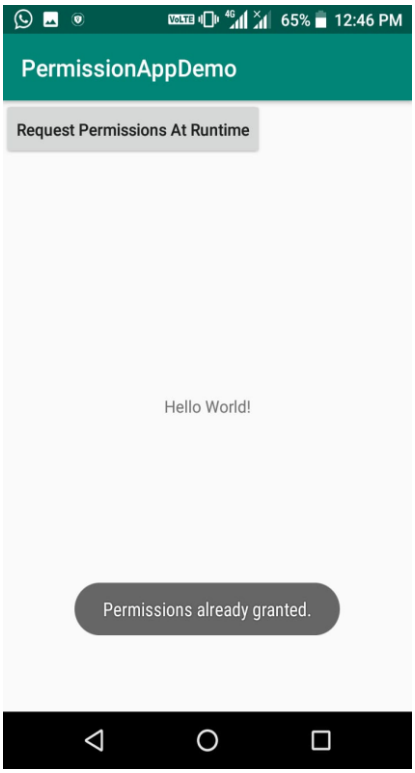
PermissionAppDemo
Request Permissions At Runtime
Allow
PermissionAppDemo
to send and view SMS
messages?
4 of 5
DENY
ALLOW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PermissionAppDemo
Request Permissions At Runtime
Hello World!
Permissions already granted.