Practical: 1

Practical: Design Login activity and implement control events: Use EditText, Checkbox and Buttons

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="match_parent" android:orientation="vertical"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

        <LinearLayout

            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:layout_marginLeft="40dp"
            android:layout_marginTop="20dp"
            android:layout_marginRight="40dp"
            android:layout_marginBottom="15dp"
            android:orientation="vertical">


            <TextView android:id="@+id/login"
                android:layout_width="match_parent"
                android:layout_height="wrap_content
                "
                android:layout_marginBottom="30dp"
                android:fontFamily="cursive"
                android:gravity="center"
                android:text="Login"
                android:textSize="50sp" />

            <EditText
                android:id="@+id/editTextTextEmailAddress"
                android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="15dp" android:ems="10"
    android:gravity="center" android:hint="gmail"
    android:inputType="textEmailAddress"
    android:padding="9dp" />

<EditText android:id="@+id/editTextTextPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="15dp"
    android:layout_marginBottom="20dp"
    android:ems="10" android:gravity="center"
    android:hint="Password"
    android:inputType="textPassword"
    android:padding="9dp" />

<TextView
    android:id="@+id/languagetesxid"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Known Langage: "
    android:textSize="20dp" />

<CheckBox
    android:id="@+id/javaCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="JAVA"
    android:textSize="18sp"
    android:textStyle="italic" />

<CheckBox
    android:id="@+id/androidCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="Android"
    android:textSize="18sp"
    android:textStyle="italic" />
```

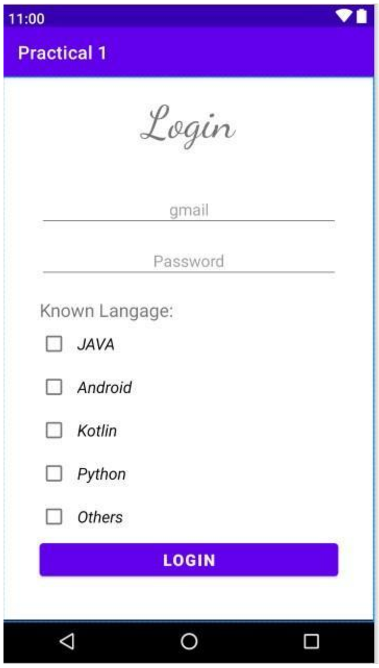
```
        <CheckBox
            android:id="@+id/kotlinCheckBox"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_centerHorizontal="true"
            android:checked="false"
            android:padding="10dp"
            android:text="Kotlin"
            android:textSize="18sp"
            android:textStyle="italic" />

        <CheckBox
            android:id="@+id/pythonCheckBox"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_centerHorizontal="true"
            android:checked="false"
            android:padding="10dp"
            android:text="Python"
            android:textSize="18sp"
            android:textStyle="italic" />

        <CheckBox
            android:id="@+id/otherCheckBox"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_centerHorizontal="true"
            android:checked="false"
            android:padding="10dp"
            android:text="Others"
            android:textSize="18sp"
            android:textStyle="italic" />

        <Button android:id="@+id/loginnbtn"
            android:layout_width="match_parent"
            android:layout_height="wrap_content
            " android:text="Login"
            android:textColor="#FBF5F5"
            android:textSize="18sp"
            android:textStyle="bold" />

    </LinearLayout>
</LinearLayout>
```

```
</LinearLayout>
```

MainActivtity.java

```
package com.example.practical1;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; public class MainActivity
extends AppCompatActivity {

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

Output:



Practical: 2

Practical: Implement Practical 1 using following layouts:
1. Linear Layout
2. Relative Layout
3. Table Layout

1) Linear Layout:

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="match_parent" android:orientation="vertical"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

        <LinearLayout

            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:layout_marginLeft="40dp"
            android:layout_marginTop="20dp"
            android:layout_marginRight="40dp"
            android:layout_marginBottom="15dp"
            android:orientation="vertical">


            <TextView android:id="@+id/login"
                android:layout_width="match_parent"
                android:layout_height="wrap_content
                "
                android:layout_marginBottom="30dp"
                android:fontFamily="cursive"
                android:gravity="center"
                android:text="Login"
                android:textSize="50sp" />
```

```
<EditText
    android:id="@+id/editTextTextEmailAddress"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="15dp"
    android:ems="10" android:gravity="center"
    android:hint="gmail"
    android:inputType="textEmailAddress"
    android:padding="9dp" />

<EditText android:id="@+id/editTextTextPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="15dp"
    android:layout_marginBottom="20dp"
    android:ems="10" android:gravity="center"
    android:hint="Password"
    android:inputType="textPassword"
    android:padding="9dp" />

<TextView
    android:id="@+id/languagetesxid"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Known Langage: "
    android:textSize="20dp" />

<CheckBox
    android:id="@+id/javaCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="JAVA"
    android:textSize="18sp"
    android:textStyle="italic" />

<CheckBox
    android:id="@+id/androidCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="Android"
    android:textSize="18sp"
    android:textStyle="italic" />

<CheckBox
    android:id="@+id/kotlinCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="Kotlin"
    android:textSize="18sp"
    android:textStyle="italic" />

<CheckBox
    android:id="@+id/pythonCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="Python"
    android:textSize="18sp"
    android:textStyle="italic" />

<CheckBox
    android:id="@+id/otherCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="Others"
    android:textSize="18sp"
    android:textStyle="italic" />

<Button android:id="@+id/loginnbtn"
    android:layout_width="match_parent"
    android:layout_height="wrap_content
    " android:text="Login"
    android:textColor="#FBF5F5"
    android:textSize="18sp"
    android:textStyle="bold" />
```

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

2) Relative Layout:

activity_relative_layout.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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=".RelativeLayout">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_marginLeft="40dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="40dp"
        android:layout_marginBottom="15dp">

        <TextView android:id="@+id/textView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_alignParentTop="true"
            android:fontFamily="cursive"
            android:gravity="center"
            android:text="Login"
            android:textSize="50dp" />

        <EditText
            android:id="@+id/editTextTextEmailAddress"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_below="@+id/textView"
            android:layout_marginTop="14dp" android:ems="10"
            android:gravity="center" android:hint="gmail"
            android:inputType="textEmailAddress"
            android:padding="9dp" />
```

```
<EditText android:id="@+id/editTextTextPassword"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_below="@+id/editTextTextEmailAddress
   " android:layout_marginTop="15dp"
   android:layout_marginBottom="20dp" android:ems="10"
   android:gravity="center" android:hint="Password"
   android:inputType="textPassword"
   android:padding="9dp" />

<TextView
   android:id="@+id/languagetesxid"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_below="@+id/editTextTex
   tPassword" android:text="Known
   Langage: " android:textSize="20dp" />

<CheckBox android:id="@+id/javaCheckBox"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_below="@+id/languagetesxid"
   android:checked="false" android:padding="10dp"
   android:text="JAVA" android:textSize="18sp"
   android:textStyle="italic" />

<CheckBox android:id="@+id/androidCheckBox"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_below="@+id/javaCheckBox"
   android:checked="false" android:padding="10dp"
   android:text="Android" android:textSize="18sp"
   android:textStyle="italic" />

<CheckBox android:id="@+id/kotlinCheckBox"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_below="@+id/androidCheckBox"
   android:checked="false" android:padding="10dp"
   android:text="Kotlin" android:textSize="18sp"
   android:textStyle="italic" />

<CheckBox android:id="@+id/pythonCheckBox"
   android:layout_width="wrap_content"
```

```
         android:layout_height="wrap_content"
         android:layout_below="@+id/kotlinCheckBox"
         android:checked="false" android:padding="10dp"
         android:text="Python"
         android:textSize="18sp"
         android:textStyle="italic" />

      <CheckBox android:id="@+id/otherCheckBox"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:layout_below="@+id/pythonCheckBox"
         android:checked="false" android:padding="10dp"
         android:text="Others" android:textSize="18sp"
         android:textStyle="italic" />

      <Button android:id="@+id/loginnbtn"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_below="@+id/otherCheckBox
         " android:layout_marginTop="9dp"
         android:text="Login"
         android:textColor="#FBF5F5"
         android:textSize="18sp" android:textStyle="bold"
         />

    </RelativeLayout>
 </RelativeLayout>
```

3) Table Layout:

activity_table_layout.xml

```
 <?xml version="1.0" encoding="utf-8"?>
 <TableLayout 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:layout_marginLeft="40dp"
     android:layout_marginTop="20dp" android:layout_marginRight="40dp"
     android:layout_marginBottom="15dp"
     tools:context=".TableLayout">
    <TableRow
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:gravity="center">
    <TextView android:id="@+id/login"
        android:layout_width="match_parent"
        android:layout_height="wrap_content
        " android:fontFamily="cursive"
        android:gravity="center"
        android:text="Login"
        android:textSize="50sp" /> </TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center">
    <EditText
        android:id="@+id/editTextTextEmailAddress"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:ems="10" android:gravity="center"
        android:hint="gmail"
        android:inputType="textEmailAddress"
        android:padding="9dp" />
</TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center">
    <EditText
        android:id="@+id/editTextTextPassword"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="15dp"
        android:layout_marginBottom="10dp"
        android:gravity="center"
        android:hint="Password"
        android:inputType="textPassword" />
</TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
    <TextView
android:id="@+id/languagetesxid"
android:layout_width="match_parent"
```

```
android:layout_height="wrap_content"
android:text="Known Langage: "
android:textSize="20dp" /> </TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
   <CheckBox
       android:id="@+id/javaCheckBox"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:layout_centerHorizontal="true"
       android:checked="false"
       android:padding="10dp"
       android:text="JAVA"
       android:textSize="18sp"
       android:textStyle="italic" />
</TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
   <CheckBox
       android:id="@+id/androidCheckBox"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:layout_centerHorizontal="true"
       android:checked="false"
       android:padding="10dp"
       android:text="Android"
       android:textSize="18sp"
       android:textStyle="italic" /> </TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
   <CheckBox
       android:id="@+id/kotlinCheckBox"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:layout_centerHorizontal="true"
       android:checked="false"
       android:padding="10dp"
       android:text="Kotlin"
       android:textSize="18sp"
       android:textStyle="italic" /> </TableRow>
```

```
  <TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content">

    <CheckBox
    android:id="@+id/pythonCheckBox"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:checked="false"
    android:padding="10dp"
    android:text="Python"
    android:textSize="18sp"
      android:textStyle="italic" /> </TableRow>
  <TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
    <CheckBox
      android:id="@+id/otherCheckBox"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_centerHorizontal="true"
      android:checked="false"
      android:padding="10dp"
      android:text="Others"
      android:textSize="18sp"
      android:textStyle="italic" /> </TableRow>

  <TableRow
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center">

    <Button android:id="@+id/loginnbtn"
      android:layout_width="match_parent"
      android:layout_height="wrap_content
      " android:text="Login"
      android:textColor="#FBF5F5"
      android:textSize="18sp"
      android:textStyle="bold" />
  </TableRow>

</TableLayout>
```

MainActivtity.java

```
package com.example.practical1;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; public class MainActivity
extends AppCompatActivity {

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

Output:

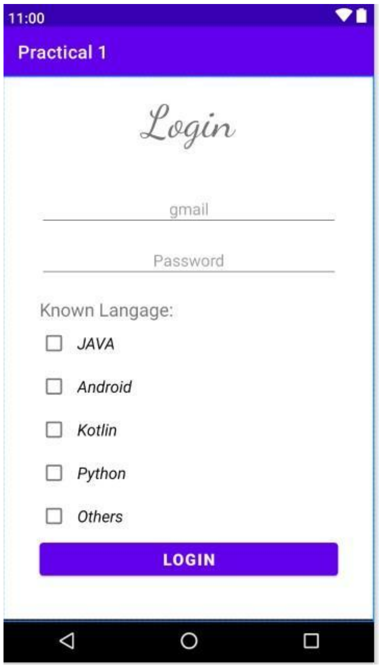


Figure 1 [Linear Layout]

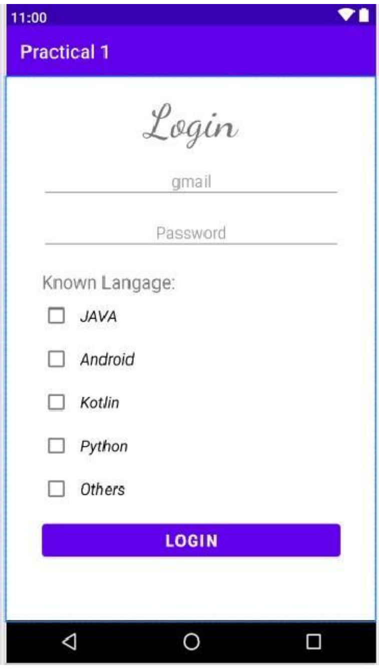


figure 2 [Relative Layout]

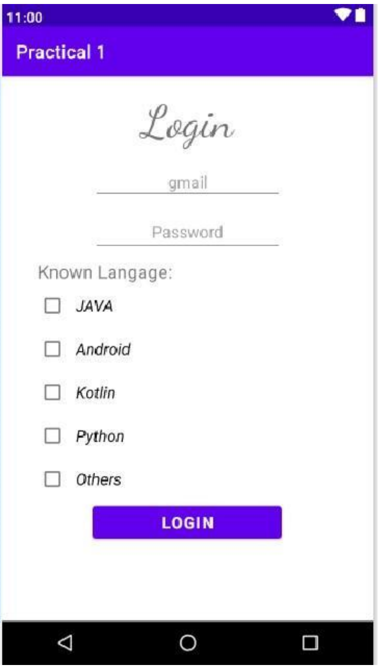


figure 3 [Linear Layout]

Practical: 3

Practical: Create Activities & implement following
1. Implicit intent
2. Explicit Intent
3. StartActivityForResult

Implicit Intent

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="match_parent"
android:orientation="vertical"     android:padding="16dp"
    tools:context="com.example.android.implicitintents.MainActivity">

    <EditText
        android:id="@+id/website_edittext"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="@string/edittext_uri"/>
     <Button
        android:id="@+id/open_website_button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="24dp"        android:text="@string/button_uri"
android:onClick="openWebsite"/>

    <EditText
        android:id="@+id/location_edittext"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="@string/edittext_loc"/>
     <Button
        android:id="@+id/open_location_button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="24dp"        android:text="@string/button_loc"
android:onClick="openLocation"/>

    <EditText
```

```
        android:id="@+id/share_edittext"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="@string/edittext_share"/>

    <Button
        android:id="@+id/share_text_button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="24dp"
android:text="@string/button_share"        android:onClick="shareText"/>

</LinearLayout>
```

ActivityMain.java

```
package com.example.android.implicitintents;
 import android.content.Intent;
import android.net.Uri; import
android.os.Bundle;
import android.support.v4.app.ShareCompat; import
android.support.v7.app.AppCompatActivity; import
android.util.Log; import android.view.View; import
android.widget.EditText;

/**
 * The ImplicitIntents app contains three buttons for sending implicit intents:
 * - Open a URL in a browser
 * - Find a location on a map
 * - Share a text string
 */
public class MainActivity extends AppCompatActivity {
     private EditText mWebsiteEditText;
private EditText mLocationEditText;
private EditText mShareTextEditText;

    /**
 * Initializes the activity.
     *
 * @param savedInstanceState The current state data.
     */     @Override
    protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_main);
```

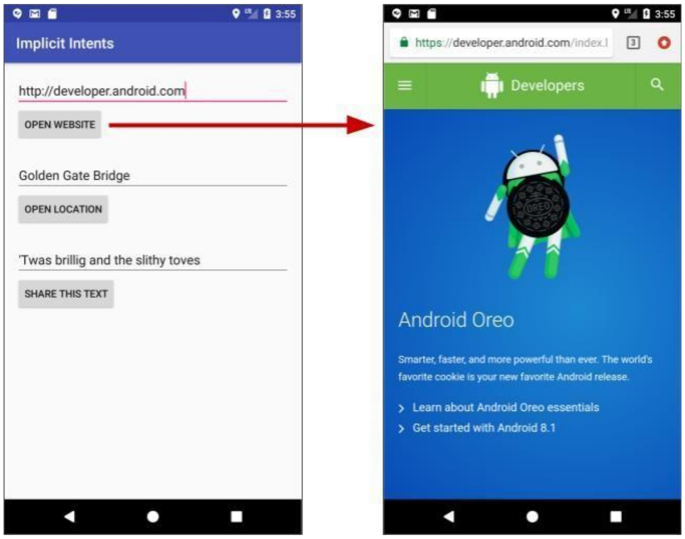
```
     mWebsiteEditText = findViewById(R.id.website_edittext);
mLocationEditText = findViewById(R.id.location_edittext);
mShareTextEditText = findViewById(R.id.share_edittext);
  }

  /**
* Handles the onClick for the "Open Website" button. Gets the URI
* from the edit text and sends an implicit intent for that URL.
   *
* @param view The view (Button) that was clicked.
   */
  public void openWebsite(View view) {
    // Get the URL text.
    String url = mWebsiteEditText.getText().toString();

    // Parse the URI and create the intent.
    Uri webpage = Uri.parse(url);
    Intent intent = new Intent(Intent.ACTION_VIEW, webpage);

    // Find an activity to hand the intent and start that activity.
    if (intent.resolveActivity(getPackageManager()) != null) {          startActivity(intent);
    } else {
      Log.d("ImplicitIntents", "Can't handle this!");
    }
  }

  /**
* Handles the onClick for the "Open Location" button. Gets the location      * text from
  the edit text and sends an implicit intent for that location.
   *
* The location text can be any searchable geographic location.
   *
* @param view The view (Button) that was clicked.
   */
  public void openLocation(View view) {
    // Get the string indicating a location. Input is not validated; it is
    // passed to the location handler intact.
    String loc = mLocationEditText.getText().toString();

    // Parse the location and create the intent.
    Uri addressUri = Uri.parse("geo:0,0?q=" + loc);
    Intent intent = new Intent(Intent.ACTION_VIEW, addressUri);

    // Find an activity to handle the intent, and start that activity.
```

```
        if (intent.resolveActivity(getPackageManager()) != null) {
            startActivity(intent);
        } else {
            Log.d("ImplicitIntents", "Can't handle this intent!");
        }
    }

    /**
 * Handles the onClick for the "Share This Text" button. The
 * implicit intent here is created by the  {@link ShareCompat.IntentBuilder}       * class.
    An app chooser appears with the available options for sharing.
     *
 * ShareCompat.IntentBuilder is from the v4 Support Library.
     *
 * @param view The view (Button) that was clicked.
     */
    public void shareText(View view) {
        String txt = mShareTextEditText.getText().toString();
        String mimeType = "text/plain";
        ShareCompat.IntentBuilder
                .from(this)
                .setType(mimeType)
                .setChooserTitle(R.string.share_text_with)
                .setText(txt)
                .startChooser();
    } }
```

strings.xml

```
<resources>
    <string name="app_name">Implicit Intents</string>

    <string name="edittext_uri">http://developer.android.com</string>
    <string name="button_uri">Open Website</string>

    <string name="edittext_loc">Golden Gate Bridge</string>
    <string name="button_loc">Open Location</string>

    <string name="edittext_share">\'Twas brillig and the slithy toves</string>
    <string name="button_share">Share This Text</string>
    <string name="share_text_with">Share this text with:</string>

</resources>
```

Output:



3:55
Implicit Intents
OPEN WEBSITE
OPEN LOCATION
SHARE THIS TEXT
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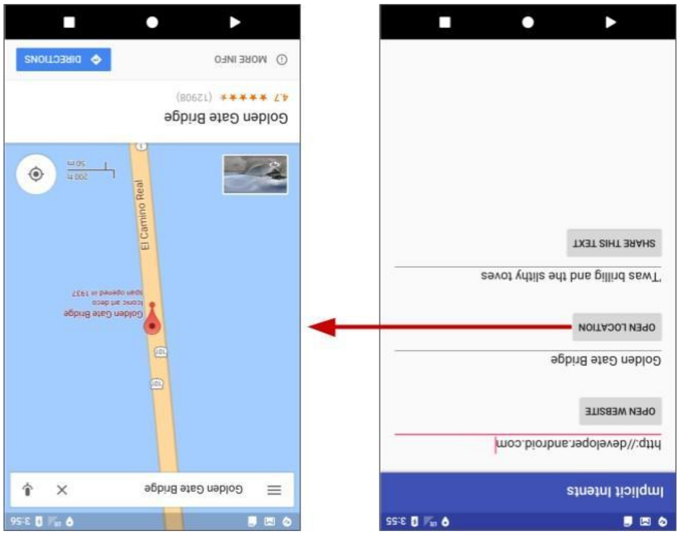
Golden Gate Bridge

'Twas brillig and the slithy toves



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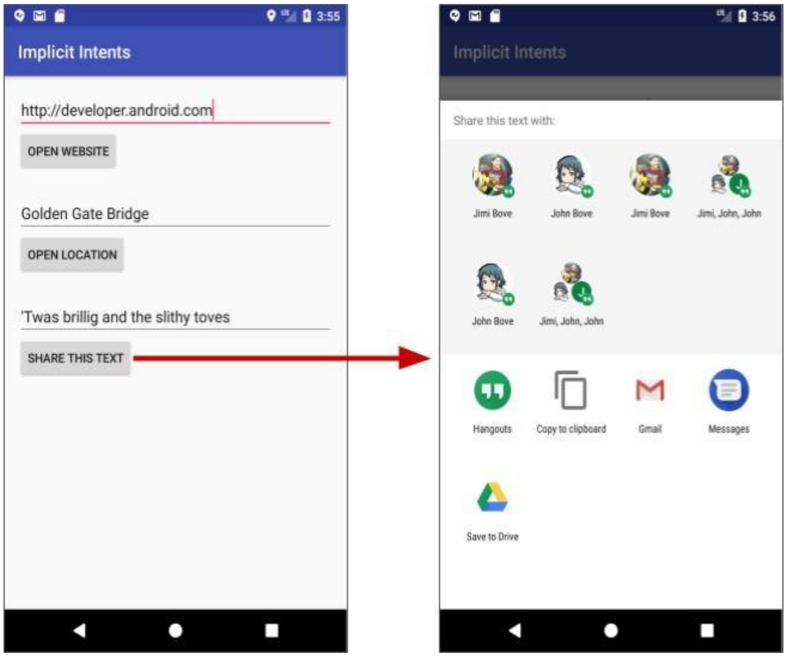
Golden Gate Bridge

'Twas brillig and the slithy toves



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Golden Gate Bridge

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Implicit Intents Receiver activity_main.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"
   tools:context="com.example.android.implicitintentsreceiver.MainActivity">
   <TextView
       android:id="@+id/text_uri_message"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:textSize="18sp"        android:textStyle="bold"
       app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent" />

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

MainActivity.java

```
package com.example.android.implicitintentsreceiver;
 import android.content.Intent;
import android.net.Uri; import
android.os.Bundle;
import android.support.v7.app.AppCompatActivity; import
android.widget.TextView;

/**
* The ImplicitIntentsReceiver app registers itself for implicit intents  * that come from
  browsable links (URLs) with the scheme:http and
* host:developer.android.com (see AndroidManifest.xml).
 *
* If it receives that intent, the app just prints the incoming URI
* to a TextView.
 *
* ImplicitIntentsReceiver is intended to be used in conjunction with
* the ImplicitIntents app, but will receive a matching implicit intent
* from any app (for example, a link in an email.)
 */
public class MainActivity extends AppCompatActivity {

  /**
* Initializes the activity.
   *
* @param savedInstanceState The current state data
   */    @Override
  protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_main);

     Intent intent = getIntent();        Uri uri
= intent.getData();        if (uri != null) {
        String uri_string = getString(R.string.uri_label)
             + uri.toString();
        TextView textView = findViewById(R.id.text_uri_message);
        textView.setText(uri_string);
     }
  } }
```

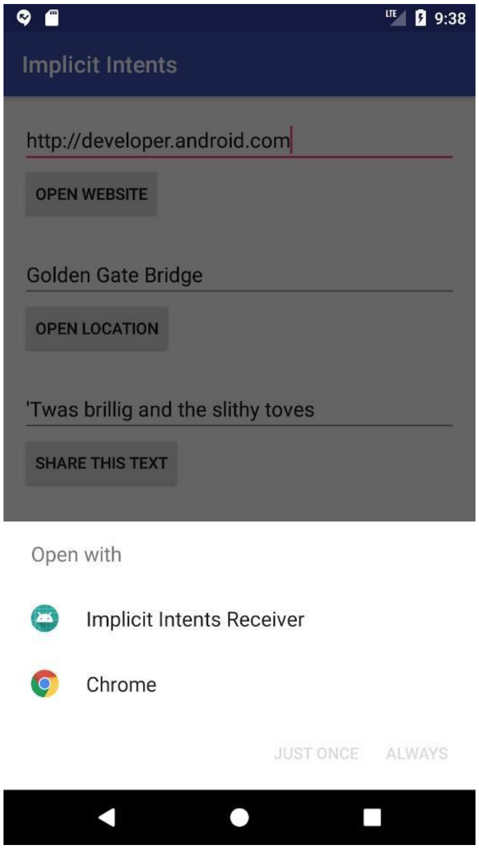
strings.xml

```
<resources>
   <string name="app_name">Implicit Intents Receiver</string>
   <string name="uri_label">URI:</string>
</resources>
```

AndroidManifest.xml

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

   <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>

         <intent-filter>
            <action android:name="android.intent.action.VIEW" />
            <category android:name="android.intent.category.DEFAULT" />
            <category android:name="android.intent.category.BROWSABLE" />             <data
android:scheme="http" android:host="developer.android.com" />
         </intent-filter>
      </activity>
   </application>

</manifest>
```

Output:



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Golden Gate Bridge

'Twas brillig and the slithy toves

Explicit Intent & StartActivityForResult

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<!--
  ~ Copyright (C) 2018 Google Inc.
  ~
  ~ Licensed under the Apache License, Version 2.0 (the "License");   ~ you
may not use this file except in compliance with the License.
  ~ You may obtain a copy of the License at
  ~
  ~     http://www.apache.org/licenses/LICENSE-2.0
  ~
  ~ Unless required by applicable law or agreed to in writing, software
  ~ distributed under the License is distributed on an "AS IS" BASIS,   ~ WITHOUT
WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.   ~ See
the License for the specific language governing permissions and
  ~ limitations under the License.
  -->

<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.android.twoactivities.MainActivity">

    <TextView
        android:id="@+id/text_header_reply"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginStart="8dp"
android:layout_marginLeft="8dp"        android:layout_marginTop="16dp"
android:text="@string/text_header_reply"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textStyle="bold"        android:visibility="invisible"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/text_message_reply"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"        android:layout_marginLeft="8dp"
android:layout_marginTop="8dp"        android:visibility="invisible"
app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/text_header_reply" />

    <Button
        android:id="@+id/button_main"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginRight="16dp"
android:text="@string/button_main"
android:onClick="launchSecondActivity"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintRight_toRightOf="parent" />

    <EditText
        android:id="@+id/editText_main"
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
```

```
android:layout_marginEnd="8dp"
android:layout_marginStart="8dp"        android:ems="10"
        android:hint="@string/editText_main"
android:inputType="textLongMessage"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/button_main"
app:layout_constraintStart_toStartOf="parent" />
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.android.twoactivities;
 import android.content.Intent; import
android.os.Bundle; import
android.support.v7.app.AppCompatActivity; import
android.util.Log; import android.view.View; import
android.widget.EditText; import
android.widget.TextView;

/**
 * The TwoActivities app contains two activities and sends messages  *
(intents) between them.
 */
public class MainActivity extends AppCompatActivity {
    // Class name for Log tag
    private static final String LOG_TAG = MainActivity.class.getSimpleName();
    // Unique tag required for the intent extra
    public static final String EXTRA_MESSAGE
            = "com.example.android.twoactivities.extra.MESSAGE";
    // Unique tag for the intent reply     public static
final int TEXT_REQUEST = 1;

    // EditText view for the message     private
EditText mMessageEditText;     // TextView for
the reply header     private TextView
mReplyHeadTextView;     // TextView for the
reply body     private TextView
mReplyTextView;

    /**
*  Initializes the activity.
     *
*  @param savedInstanceState The current state data.
```

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

       // Initialize all the view variables.         mMessageEditText =
findViewById(R.id.editText_main);         mReplyHeadTextView =
findViewById(R.id.text_header_reply);         mReplyTextView =
findViewById(R.id.text_message_reply);
   }

   /**
* Handles the onClick for the "Send" button. Gets the value of the main
EditText,
* creates an intent, and launches the second activity with that intent.
    *
* The return intent from the second activity is onActivityResult().
    *
* @param view The view (Button) that was clicked.
    */
   public void launchSecondActivity(View view) {
       Log.d(LOG_TAG, "Button clicked!");
       Intent intent = new Intent(this, SecondActivity.class);         String message
= mMessageEditText.getText().toString();
intent.putExtra(EXTRA_MESSAGE, message);
startActivityForResult(intent, TEXT_REQUEST);
   }

   /**
* Handles the data in the return intent from SecondActivity.
    *
* @param requestCode Code for the SecondActivity request.
* @param resultCode Code that comes back from SecondActivity.
* @param data Intent data sent back from SecondActivity.
    */     @Override
   public void onActivityResult(int requestCode, int resultCode, Intent data) {
super.onActivityResult(requestCode, resultCode, data);

       // Test for the right intent reply.         if
(requestCode == TEXT_REQUEST) {
           // Test to make sure the intent reply result was good.             if
(resultCode == RESULT_OK) {
               String reply = data.getStringExtra(SecondActivity.EXTRA_REPLY);
               // Make the reply head visible.
               mReplyHeadTextView.setVisibility(View.VISIBLE);
```

```
                // Set the reply and make it visible.
                mReplyTextView.setText(reply);
                mReplyTextView.setVisibility(View.VISIBLE);
            }
        }
    }
}
```

activity_second.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"
    tools:context="com.example.android.twoactivities.SecondActivity">

    <TextView
        android:id="@+id/text_header"         android:layout_width="wrap_content"
android:layout_height="wrap_content"         android:layout_marginStart="8dp"
android:layout_marginLeft="8dp"         android:layout_marginTop="16dp"
android:text="@string/text_header"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textStyle="bold"
        app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/text_message"
        android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"         android:layout_marginLeft="8dp"
android:layout_marginTop="8dp"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/text_header" />
     <Button
        android:id="@+id/button_second"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginRight="16dp"
android:text="@string/button_second"         android:onClick="returnReply"
```

```
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintRight_toRightOf="parent" />

   <EditText
       android:id="@+id/editText_second"
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginEnd="8dp"
android:layout_marginStart="8dp"       android:ems="10"
       android:hint="@string/editText_second"
android:inputType="textLongMessage"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/button_second"
app:layout_constraintStart_toStartOf="parent" />
</android.support.constraint.ConstraintLayout>
```

SecondActivity.java

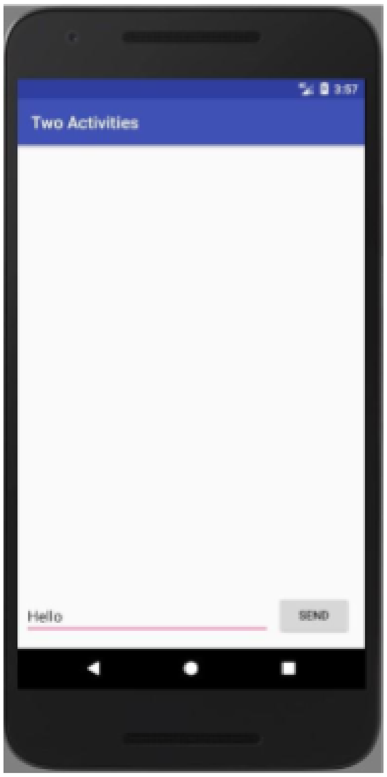
```
package com.example.android.twoactivities;
 import android.content.Intent;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.View; import
android.widget.EditText; import
android.widget.TextView;

/**
* SecondActivity defines the second activity in the app. It is  * launched from an intent
   with a message, and sends an intent  * back with a second message.
 */ public class SecondActivity extends AppCompatActivity {
   // Unique tag for the intent reply.
   public static final String EXTRA_REPLY =
          "com.example.android.twoactivities.extra.REPLY";

   // EditText for the reply.     private
EditText mReply;

   /**
* Initializes the activity.
    *
* @param savedInstanceState The current state data
    */    @Override
```

```
  protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_second);

    // Initialize view variables.        mReply =
findViewById(R.id.editText_second);

    // Get the intent that launched this activity, and the message in
    // the intent extra.
    Intent intent = getIntent();
    String message = intent.getStringExtra(MainActivity.EXTRA_MESSAGE);

    // Put that message into the text_message TextView        TextView
textView = findViewById(R.id.text_message);
textView.setText(message);
  }

  /**
* Handles the onClick for the "Reply" button. Gets the message from the      * second
  EditText, creates an intent, and returns that message back to
* the main activity.
   *
* @param view The view (Button) that was clicked.
   */
  public void returnReply(View view) {
    // Get the reply message from the edit text.
    String reply = mReply.getText().toString();

    // Create a new intent for the reply, add the reply message to it
    // as an extra, set the intent result, and close the activity.        Intent
replyIntent = new Intent();        replyIntent.putExtra(EXTRA_REPLY, reply);
setResult(RESULT_OK, replyIntent);        finish();
  } }
```

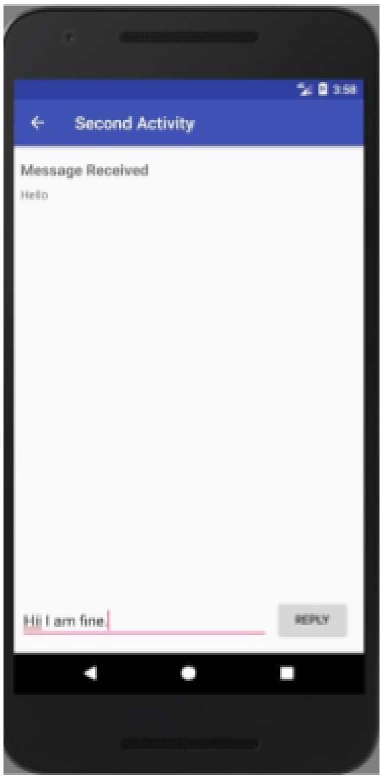
strings.xml

```
<resources>
  <string name="app_name">Two Activities</string>
  <string name="button_main">Send</string>
  <string name="editText_main">Enter Your Message Here</string>
  <string name="text_header">Message Received</string>
  <string name="button_second">Reply</string>
  <string name="editText_second">Enter Your Reply Here</string>
  <string name="text_header_reply">Reply Received</string>
</resources>
```

Output:



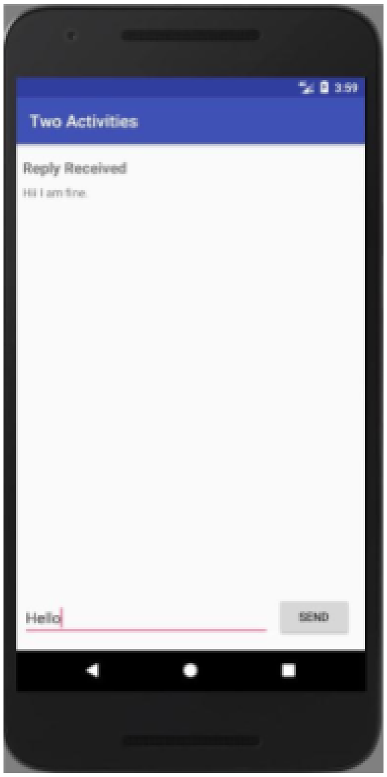
Hello



Message Received

Hello

Hi! I am fine.



Reply Received

Hi! I am fine.

Hello

Practical: 4

Practical: Implement activity Lifecycle and State Callbacks

activity_main.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"
   tools:context="com.example.android.twoactivities.MainActivity">

   <TextView
      android:id="@+id/text_header_reply"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginStart="8dp"
android:layout_marginLeft="8dp"        android:layout_marginTop="16dp"
android:text="@string/text_header_reply"
      android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textStyle="bold"        android:visibility="invisible"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

   <TextView
      android:id="@+id/text_message_reply"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"        android:layout_marginLeft="8dp"
android:layout_marginTop="8dp"        android:visibility="invisible"
app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toBottomOf="@+id/text_header_reply" />
    <Button
      android:id="@+id/button_main"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginRight="16dp"
android:text="@string/button_main"
android:onClick="launchSecondActivity"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintRight_toRightOf="parent" />



<EditText
```

```
        android:id="@+id/editText_main"
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginEnd="8dp"
android:layout_marginStart="8dp"         android:ems="10"
        android:hint="@string/editText_main"
android:inputType="textLongMessage"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/button_main"
app:layout_constraintStart_toStartOf="parent" />
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.android.twoactivities;
 import android.content.Intent;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.util.Log; import android.view.View;
import android.widget.EditText; import
android.widget.TextView;

/**
 * Version of TwoActivities app that prints messages to the logs   * on
Activity lifecycle state changes.
 */
public class MainActivity extends AppCompatActivity {
    // Class name for Log tag
    private static final String LOG_TAG = MainActivity.class.getSimpleName();
    // Unique tag required for the intent extra      public static
final String EXTRA_MESSAGE
            = "com.example.android.twoactivities.extra.MESSAGE";
    // Unique tag for the intent reply      public static
final int TEXT_REQUEST = 1;

    // EditText view for the message      private
EditText mMessageEditText;      // TextView for
the reply header      private TextView
mReplyHeadTextView;      // TextView for the
reply body      private TextView
mReplyTextView;

    @Override
```

```
   protected void onStart() {
super.onStart();        Log.d(LOG_TAG,
"onStart");     }

   /**
* Maintains the Activity state across configuration changes.
    *
* @param outState Activity state data to save
    */     @Override
   public void onSaveInstanceState(Bundle outState) {
super.onSaveInstanceState(outState);
       if (mReplyHeadTextView.getVisibility() == View.VISIBLE) {
outState.putBoolean("reply_visible", true);
           outState.putString("reply_text", mReplyTextView.getText().toString());
       }
   }

   /**
* Initializes the activity.
    *
* @param savedInstanceState The current state data
    */     @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_main);

       // Log the start of the onCreate() method.
       Log.d(LOG_TAG, "-------");
       Log.d(LOG_TAG, "onCreate");

       // Initialize all the view variables.        mMessageEditText =
findViewById(R.id.editText_main);        mReplyHeadTextView =
findViewById(R.id.text_header_reply);        mReplyTextView =
findViewById(R.id.text_message_reply);

       // Restore the state.
       if (savedInstanceState != null) {            boolean
isVisible = savedInstanceState
.getBoolean("reply_visible");            if (isVisible) {
               mReplyHeadTextView.setVisibility(View.VISIBLE);
mReplyTextView.setText(savedInstanceState                     .getString("reply_text"));
mReplyTextView.setVisibility(View.VISIBLE);
           }
       }
   }
   /**
*  Handles the onClick for the "Send" button. Gets the value of the main       * EditText,
   creates an intent, and launches the second activity with
*  that intent.
    *
*  The return intent from the second activity is onActivityResult().
    *
*  @param view The view (Button) that was clicked.
    */
   public void launchSecondActivity(View view) {
       Log.d(LOG_TAG, "Button clicked!");
       Intent intent = new Intent(this, SecondActivity.class);        String message
= mMessageEditText.getText().toString();
intent.putExtra(EXTRA_MESSAGE, message);
startActivityForResult(intent, TEXT_REQUEST);
   }

   /**
*  Handles the data in the return intent from SecondActivity.
    *
*  @param requestCode Code for the SecondActivity request.
*  @param resultCode Code that comes back from SecondActivity.
*  @param data Intent data sent back from SecondActivity.
    */    @Override
   public void onActivityResult(int requestCode, int resultCode, Intent data) {
super.onActivityResult(requestCode, resultCode, data);

       // Test for the right intent reply.         if
(requestCode == TEXT_REQUEST) {
           // Test to make sure the intent reply result was good.             if
(resultCode == RESULT_OK) {
               String reply = data.getStringExtra(SecondActivity.EXTRA_REPLY);
               // Make the reply head visible.
               mReplyHeadTextView.setVisibility(View.VISIBLE);

               // Set the reply and make it visible.
               mReplyTextView.setText(reply);
               mReplyTextView.setVisibility(View.VISIBLE);
           }
       }
   }

   @Override
```

```
    protected void onPause() {        super.onPause();
        Log.d(LOG_TAG, "onPause");
    }

    @Override
    protected void onRestart() {        super.onRestart();
        Log.d(LOG_TAG, "onRestart");
    }

    @Override
    protected void onResume() {        super.onResume();
        Log.d(LOG_TAG, "onResume");
    }

    @Override     protected void
onStop() {        super.onStop();
        Log.d(LOG_TAG, "onStop");
    }

    @Override
    protected void onDestroy() {        super.onDestroy();
        Log.d(LOG_TAG, "onDestroy");
    }
}
```

activity_second.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"
    tools:context="com.example.android.twoactivities.SecondActivity">

    <TextView
        android:id="@+id/text_header"        android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginStart="8dp"
android:layout_marginLeft="8dp"        android:layout_marginTop="16dp"
android:text="@string/text_header"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textStyle="bold"
        app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />
```

```
   <TextView
       android:id="@+id/text_message"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"        android:layout_marginLeft="8dp"
android:layout_marginTop="8dp"
app:layout_constraintStart_toStartOf="parent"
       app:layout_constraintTop_toBottomOf="@+id/text_header" />
    <Button
       android:id="@+id/button_second"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginRight="16dp"
android:text="@string/button_second"        android:onClick="returnReply"
       app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintRight_toRightOf="parent" />

   <EditText
       android:id="@+id/editText_second"
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_marginBottom="16dp"
android:layout_marginEnd="8dp"
android:layout_marginStart="8dp"        android:ems="10"
       android:hint="@string/editText_second"
android:inputType="textLongMessage"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/button_second"
app:layout_constraintStart_toStartOf="parent" />
</android.support.constraint.ConstraintLayout>
```

SecondActivity.java

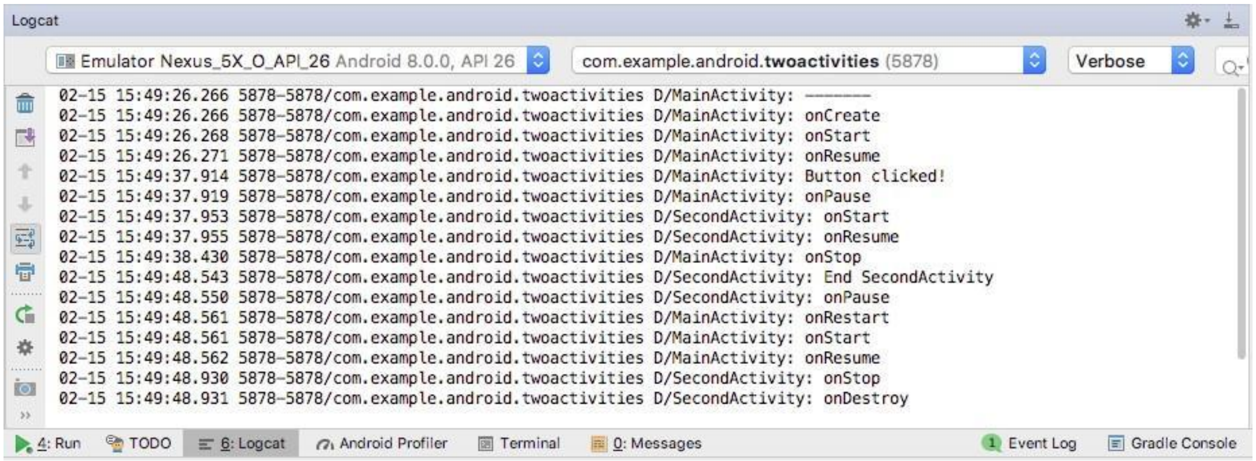
```
package com.example.android.twoactivities;

import android.content.Intent; import
android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.util.Log; import android.view.View;
import android.widget.EditText; import
android.widget.TextView;

/**
```

```
* SecondActivity defines the second activity in the app. It is launched
* from an intent with a message, and sends an intent back with a second  * message.
  */
public class SecondActivity extends AppCompatActivity {
  // Class name for Log tag.     private static
final String LOG_TAG
         = SecondActivity.class.getSimpleName();
  // Unique tag for the intent reply.
  public static final String EXTRA_REPLY =
         "com.example.android.twoactivities.extra.REPLY";

  // EditText for the reply.     private
EditText mReply;

  @Override
  protected void onStart() {
super.onStart();        Log.d(LOG_TAG,
"onStart");
  }

  /**
* Initializes the activity.
   *
* @param savedInstanceState The current state data.
   */     @Override
  protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_second);

     // Initialize view variables.         mReply =
findViewById(R.id.editText_second);

     // Get the intent that launched this activity, and the message in
     // the intent extra.
     Intent intent = getIntent();
     String message = intent.getStringExtra(MainActivity.EXTRA_MESSAGE);

     // Put that message into the text_message TextView.         TextView
textView = findViewById(R.id.text_message);
textView.setText(message);
  }

  /**
* Handles the onClick for the "Reply" button. Gets the message from the      * second
  EditText, creates an intent, and returns that message back to
* the main activity.
     *
* @param view The view (Button) that was clicked.
     */
    public void returnReply(View view) {
        // Get the reply message from the edit text.
        String reply = mReply.getText().toString();

        // Create a new intent for the reply, add the reply message to it         // as an extra,
set the intent result, and close the activity.
        Intent replyIntent = new Intent();
replyIntent.putExtra(EXTRA_REPLY, reply);
setResult(RESULT_OK, replyIntent);         Log.d(LOG_TAG,
"End SecondActivity");         finish();
    }

    @Override     protected void
onPause() {         super.onPause();
Log.d(LOG_TAG, "onPause");
    }

    @Override
    protected void onRestart() {
super.onRestart();         Log.d(LOG_TAG,
"onRestart");
    }

    @Override     protected void
onResume() {         super.onResume();
Log.d(LOG_TAG, "onResume");
    }

    @Override     protected void
onStop() {         super.onStop();
Log.d(LOG_TAG, "onStop");
    }

    @Override
    protected void onDestroy() {
super.onDestroy();         Log.d(LOG_TAG,
"onDestroy");
    } }
```

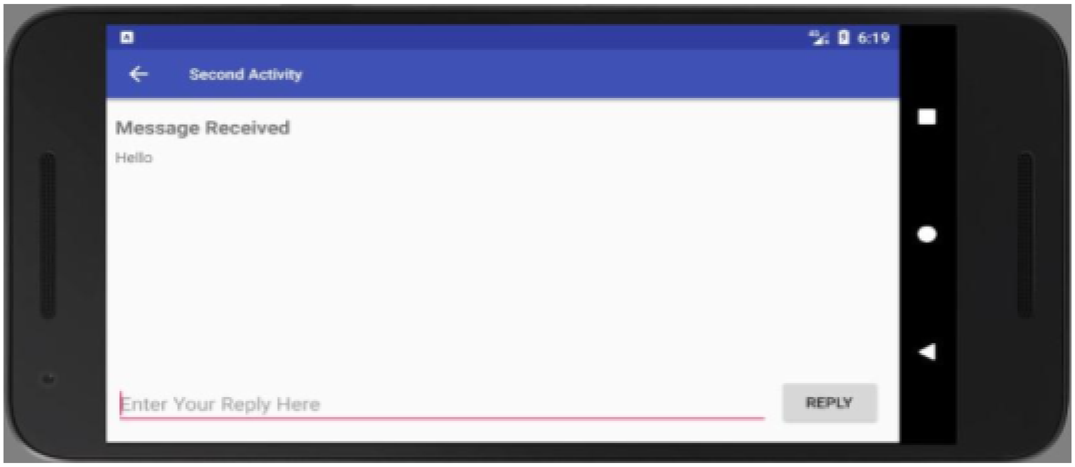
strings.xml

```
<resources>
    <string name="app_name">Two Activities</string>
    <string name="button_main">Send</string>
    <string name="editText_main">Enter Your Message Here</string>
    <string name="text_header">Message Received</string>
    <string name="button_second">Reply</string>
    <string name="editText_second">Enter Your Reply Here</string>
    <string name="text_header_reply">Reply Received</string>
</resources>
```

Output:



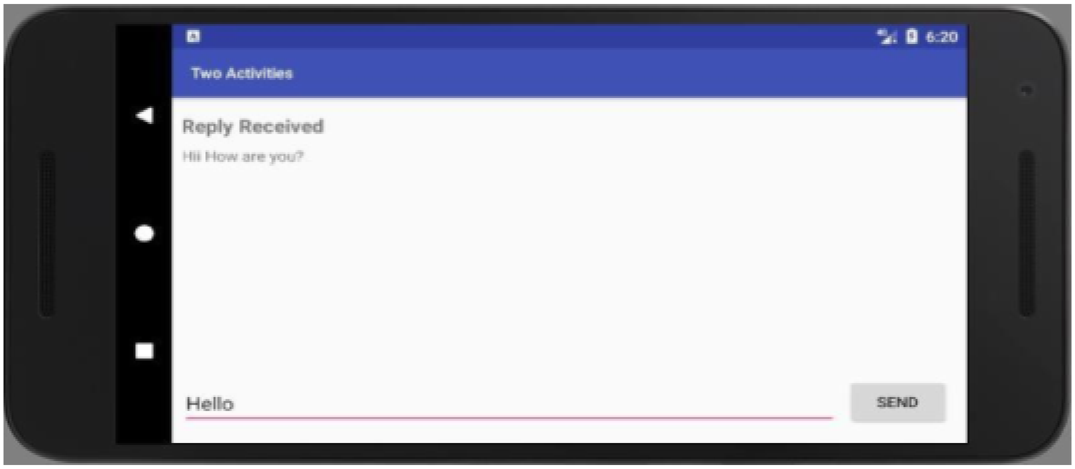
```
02-15 15:49:26.266 5878-5878/com.example.android.twoactivities D/MainActivity: -------
02-15 15:49:26.266 5878-5878/com.example.android.twoactivities D/MainActivity: onCreate
02-15 15:49:26.268 5878-5878/com.example.android.twoactivities D/MainActivity: onStart
02-15 15:49:26.271 5878-5878/com.example.android.twoactivities D/MainActivity: onResume
02-15 15:49:37.914 5878-5878/com.example.android.twoactivities D/MainActivity: Button clicked!
02-15 15:49:37.919 5878-5878/com.example.android.twoactivities D/MainActivity: onPause
02-15 15:49:37.953 5878-5878/com.example.android.twoactivities D/SecondActivity: onStart
02-15 15:49:37.955 5878-5878/com.example.android.twoactivities D/SecondActivity: onResume
02-15 15:49:38.430 5878-5878/com.example.android.twoactivities D/MainActivity: onStop
02-15 15:49:48.543 5878-5878/com.example.android.twoactivities D/SecondActivity: End SecondActivity
02-15 15:49:48.550 5878-5878/com.example.android.twoactivities D/SecondActivity: onPause
02-15 15:49:48.561 5878-5878/com.example.android.twoactivities D/MainActivity: onRestart
02-15 15:49:48.561 5878-5878/com.example.android.twoactivities D/MainActivity: onStart
02-15 15:49:48.562 5878-5878/com.example.android.twoactivities D/MainActivity: onResume
02-15 15:49:48.930 5878-5878/com.example.android.twoactivities D/SecondActivity: onStop
02-15 15:49:48.931 5878-5878/com.example.android.twoactivities D/SecondActivity: onDestroy
```



Message Received

Hello

Enter Your Reply Here



Reply Received

Hii How are you?

Hello

Practical: 5

Practical: Use an Options Menu

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.design.widget.CoordinatorLayout
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.android.droidcafeoptions.MainActivity">

    <android.support.design.widget.AppBarLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:theme="@style/AppTheme.AppBarOverlay">

        <android.support.v7.widget.Toolbar            android:id="@+id/toolbar"
android:layout_width="match_parent"
android:layout_height="?attr/actionBarSize"
android:background="?attr/colorPrimary"
app:popupTheme="@style/AppTheme.PopupOverlay" />

    </android.support.design.widget.AppBarLayout>

    <include layout="@layout/content_main" />

    <android.support.design.widget.FloatingActionButton
android:id="@+id/fab"         android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_gravity="bottom|end"
android:layout_margin="16dp"
        app:srcCompat="@drawable/ic_shopping_cart" />

</android.support.design.widget.CoordinatorLayout>
```

content_main.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"
app:layout_behavior="@string/appbar_scrolling_view_behavior"
tools:context="com.example.android.droidcafeoptions.MainActivity"
tools:showIn="@layout/activity_main">

   <TextView
        android:id="@+id/textintro"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="8dp"
android:text="@string/intro_text"
android:textSize="24sp"        android:textStyle="bold"
        app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent" />

   <ImageView
        android:id="@+id/donut"        android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
android:contentDescription="@string/donuts"
android:onClick="showDonutOrder"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textintro"
app:srcCompat="@drawable/donut_circle" />

   <ImageView
        android:id="@+id/ice_cream"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
        android:contentDescription="@string/ice_cream_sandwiches"
android:onClick="showIceCreamOrder"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/donut"
app:srcCompat="@drawable/icecream_circle" />

   <ImageView
        android:id="@+id/froyo"        android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
```

```
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
android:contentDescription="@string/froyo"
android:onClick="showFroyoOrder"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/ice_cream"
app:srcCompat="@drawable/froyo_circle" />

  <TextView
    android:id="@+id/donut_description"
android:layout_width="0dp"        android:layout_height="wrap_content"
android:layout_marginEnd="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"        android:text="@string/donuts"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toEndOf="@+id/donut"
app:layout_constraintTop_toTopOf="@+id/donut" />

  <TextView
    android:id="@+id/ice_cream_description"
android:layout_width="0dp"        android:layout_height="wrap_content"
android:layout_marginEnd="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
android:text="@string/ice_cream_sandwiches"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toEndOf="@+id/ice_cream"
app:layout_constraintTop_toTopOf="@+id/ice_cream" />

  <TextView
    android:id="@+id/froyo_description"
android:layout_width="0dp"        android:layout_height="wrap_content"
android:layout_marginEnd="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"        android:text="@string/froyo"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toEndOf="@+id/froyo"
app:layout_constraintTop_toTopOf="@+id/froyo" />

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

menu/menu_main.xml

```
<menu 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"
   tools:context="com.example.android.droidcafeoptions.MainActivity">
   <item
      android:id="@+id/action_contact"        android:orderInCategory="100"
android:title="@string/action_contact"        app:showAsAction="never" />
   <item
      android:id="@+id/action_order"
android:icon="@drawable/ic_shopping_cart"
android:orderInCategory="10"        android:title="@string/action_order"
app:showAsAction="always" />
   <item
      android:id="@+id/action_status"
android:icon="@drawable/ic_status_info"        android:orderInCategory="20"
android:title="@string/action_status"        app:showAsAction="always" />
   <item
      android:id="@+id/action_favorites"
android:icon="@drawable/ic_favorite"        android:orderInCategory="30"
android:title="@string/action_favorites"        app:showAsAction="ifRoom" />
</menu>
```

MainActivity.java

```
package com.example.android.droidcafeoptions;
 import android.content.Intent;
import android.os.Bundle;
import android.support.design.widget.FloatingActionButton;
import android.support.v7.app.AppCompatActivity; import
android.support.v7.widget.Toolbar; import android.view.Menu;
import android.view.MenuItem; import android.view.View;
import android.widget.Toast;

/**
* This app demonstrates images used as buttons and a floating action button to
* use an intent to launch a second activity. The app lets a user tap an image
* to make a choice. The app displays a Toast message showing the user's choice,
* and sends the choice as data with an intent to launch the second activity.
 *
* This version includes options in the options menu, in which some of the  * options
  appear as icons in the app bar.
 */
public class MainActivity extends AppCompatActivity {
  // Tag for the intent extra.
  public static final String EXTRA_MESSAGE =
         "com.example.android.droidcafeoptions.extra.MESSAGE";

  // The order message, displayed in the Toast and sent to the new Activity.
  private String mOrderMessage;

  /**
*  Creates the content view, the toolbar, and the floating action button.
*  This method is provided in the Basic Activity template.
   *
*  @param savedInstanceState Saved instance state bundle.
   */    @Override
  protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);        Toolbar toolbar
= findViewById(R.id.toolbar);
setSupportActionBar(toolbar);

       FloatingActionButton fab = findViewById(R.id.fab);
fab.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View view) {
             Intent intent = new Intent(MainActivity.this,
OrderActivity.class);
             intent.putExtra(EXTRA_MESSAGE, mOrderMessage);
startActivity(intent);
         }
       });
  }

  /**
*  Inflates the menu, and adds items to the action bar if it is present.
   *
*  @param menu Menu to inflate.
*  @return Returns true if the menu inflated.
   */    @Override
  public boolean onCreateOptionsMenu(Menu menu) {
       // Inflate the menu; this adds items to the action bar if it is present.
getMenuInflater().inflate(R.menu.menu_main, menu);        return true;
  }

  /**
*  Handles app bar item clicks.
```

```
    *
* @param item Item clicked.
* @return True if one of the defined items was clicked.
    */    @Override
   public boolean onOptionsItemSelected(MenuItem item) {
switch (item.getItemId()) {            case R.id.action_order:
                Intent intent = new Intent(MainActivity.this,
OrderActivity.class);
                intent.putExtra(EXTRA_MESSAGE, mOrderMessage);
startActivity(intent);                return true;            case
R.id.action_status:
displayToast(getString(R.string.action_status_message));
return true;            case R.id.action_favorites:
displayToast(getString(R.string.action_favorites_message));
return true;            case R.id.action_contact:
displayToast(getString(R.string.action_contact_message));
return true;            default:                // Do nothing
        }
        return super.onOptionsItemSelected(item);
   }

   /**
* Displays a Toast with the message.
    *
* @param message Message to display.
    */
   public void displayToast(String message) {        Toast.makeText(getApplicationContext(),
message,
                Toast.LENGTH_SHORT).show();
   }

   /**
* Shows a message that the donut image was clicked.
    */
   public void showDonutOrder(View view) {
        mOrderMessage = getString(R.string.donut_order_message);
displayToast(mOrderMessage);
   }

   /**
* Shows a message that the ice cream sandwich image was clicked.
    */
   public void showIceCreamOrder(View view) {
        mOrderMessage = getString(R.string.ice_cream_order_message);
displayToast(mOrderMessage);
    }

    /**
* Shows a message that the froyo image was clicked.
     */
    public void showFroyoOrder(View view) {
        mOrderMessage = getString(R.string.froyo_order_message);
displayToast(mOrderMessage);
    }

}
```

activity_order.java

```
<?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.android.droidcafeoptions.OrderActivity">

    <TextView
        android:id="@+id/order_textview"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"        android:layout_marginTop="8dp"
android:text="@string/order_label_text"        android:textSize="18sp"
        app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/name_label"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="32dp"
android:text="@string/name_label_text"
app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/order_textview" />

    <EditText
```

```
        android:id="@+id/name_text"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="8dp"
android:layout_marginStart="8dp"        android:ems="10"
        android:hint="@string/enter_name_hint"
android:inputType="textPersonName"
        app:layout_constraintBaseline_toBaselineOf="@+id/name_label"
app:layout_constraintStart_toEndOf="@+id/name_label" />

    <TextView
        android:id="@+id/address_label"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
android:text="@string/address_label_text"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/name_label" />

    <EditText
        android:id="@+id/address_text"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="8dp"
android:layout_marginStart="8dp"        android:ems="10"
        android:hint="@string/enter_address_hint"
android:inputType="textMultiLine"
        app:layout_constraintBaseline_toBaselineOf="@+id/address_label"
app:layout_constraintStart_toEndOf="@+id/address_label" />

    <TextView
        android:id="@+id/phone_label"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
android:text="@string/phone_label_string"
app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/address_text" />

    <EditText
    android:id="@+id/phone_text"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="8dp"
android:layout_marginStart="8dp"        android:ems="10"
    android:hint="@string/enter_phone_hint"        android:inputType="phone"
    app:layout_constraintBaseline_toBaselineOf="@+id/phone_label"
app:layout_constraintStart_toEndOf="@+id/phone_label" />

  <TextView
    android:id="@+id/note_label"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"
android:layout_marginTop="24dp"
android:text="@string/note_label_text"
app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/phone_label" />

  <EditText
    android:id="@+id/note_text"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="8dp"        android:layout_marginStart="8dp"
android:ems="10"
    android:hint="@string/enter_note_hint"
android:inputType="textCapSentences|textMultiLine"
app:layout_constraintBaseline_toBaselineOf="@+id/note_label"
app:layout_constraintStart_toEndOf="@+id/note_label" />

  <TextView
    android:id="@+id/delivery_label"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"        android:layout_marginTop="24dp"
android:text="@string/choose_delivery_method"        android:textSize="18sp"
    app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/note_text" />

  <RadioGroup
    android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="24dp"
android:layout_marginStart="24dp"        android:orientation="vertical"
```

```
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@id/delivery_label">

    <RadioButton          android:id="@+id/sameday"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:onClick="onRadioButtonClicked"
      android:text="@string/same_day_messenger_service" />

    <RadioButton          android:id="@+id/nextday"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:onClick="onRadioButtonClicked"
android:text="@string/next_day_ground_delivery"
android:checked="true"/>

    <RadioButton          android:id="@+id/pickup"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:onClick="onRadioButtonClicked"
android:text="@string/pick_up" />
  </RadioGroup>

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

<u>OrderActivity.java</u>

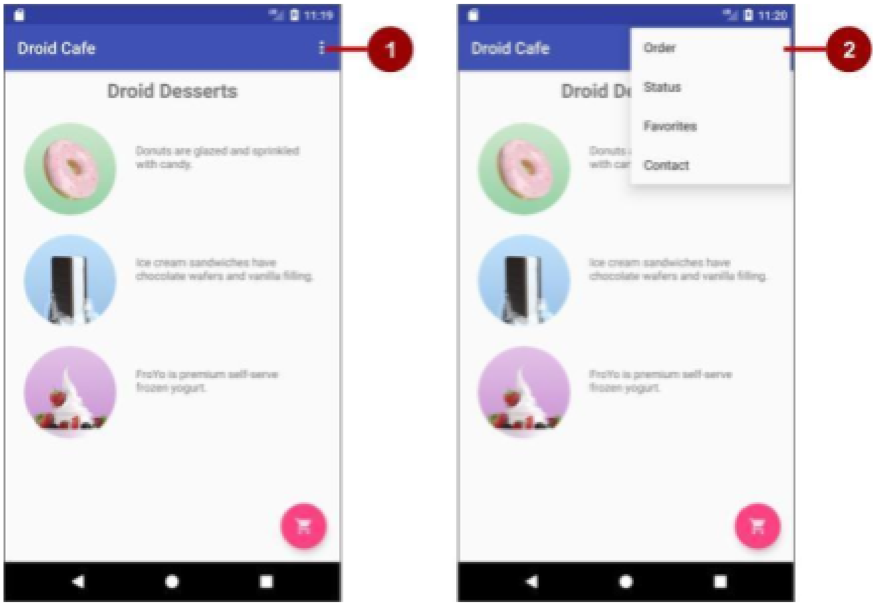
```
package com.example.android.droidcafeoptions;
 import android.content.Intent;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.View; import
android.widget.RadioButton; import
android.widget.TextView; import
android.widget.Toast;

/**
* This activity handles radio buttons for choosing a delivery method for an  * order, and
  EditText input controls.
 */
public class OrderActivity extends AppCompatActivity {

  /**
* Sets the content view to activity_order, and gets the intent and its
* data.
   *
```

```
* @param savedInstanceState Saved instance state bundle.
    */     @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);         setContentView(R.layout.activity_order);

        // Get the intent and its data.
        Intent intent = getIntent();
        String message = intent.getStringExtra(MainActivity.EXTRA_MESSAGE);
        TextView textView = findViewById(R.id.order_textview);
textView.setText(message);
    }

   /**
* Checks which radio button was clicked and displays a toast message to
* show the choice.
    *
* @param view The radio button view.
    */
   public void onRadioButtonClicked(View view) {
        // Is the button now checked?          boolean checked =
((RadioButton) view).isChecked();
        // Check which radio button was clicked.
switch (view.getId()) {              case R.id.sameday:
if (checked)
                    // Same day service
                    displayToast(getString(R.string.same_day_messenger_service));
                break;              case
R.id.nextday:                   if
(checked)
                    // Next day delivery
                    displayToast(getString(R.string.next_day_ground_delivery));                  break;
case R.id.pickup:                 if (checked)                     // Pick up
                    displayToast(getString(R.string.pick_up));
break;            default:                // Do nothing.                break;
        }
    }

   /**
* Displays the actual message in a toast message.
    *
* @param message Message to display.
    */
   public void displayToast(String message) {         Toast.makeText(getApplicationContext(),
message,
            Toast.LENGTH_SHORT).show();
    } }
```

AndroidManifest.xml

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

    <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="com.example.android.droidcafeoptions.MainActivity"
android:label="@string/app_name"
            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=".OrderActivity"
android:parentActivityName=".MainActivity"/>
    </application>
</manifest>
```

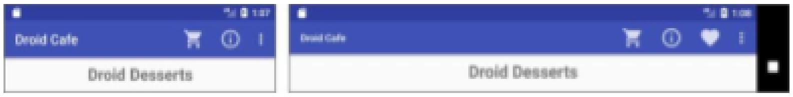
Output:

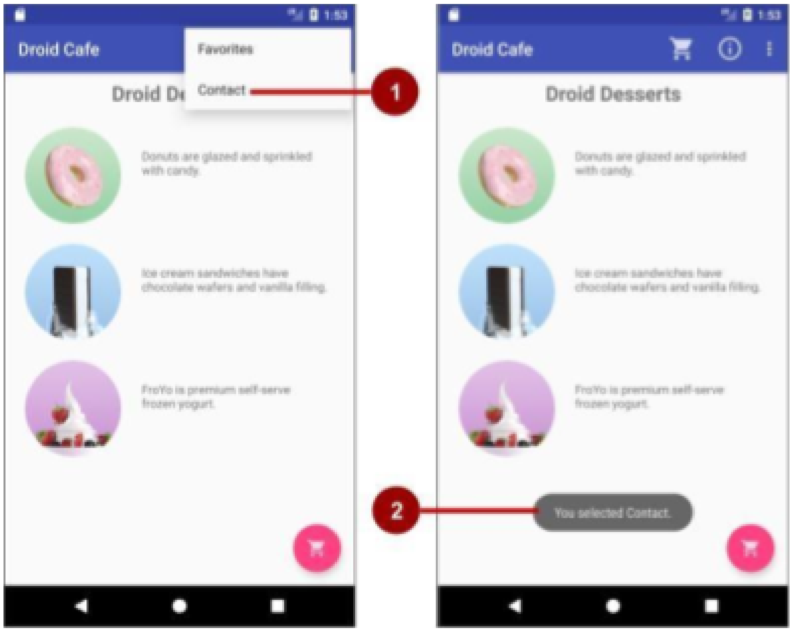


Donuts are glazed and sprinkled with candy.

Ice cream sandwiches have chocolate wafers and vanilla filling.

FroYo is premium self-serve frozen yogurt.





Donuts are glazed and sprinkled with candy.

Ice cream sandwiches have chocolate wafers and vanilla filling.

FroYo is premium self-serve frozen yogurt.

You selected Contact.

Practical: 6

Practical: Create a Recycler View and list the details of student using following fields:

- Create an activity that displays data in a RecyclerView
- Make the items in the list clickable
- Add a floating action button to add items to the list

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.design.widget.CoordinatorLayout
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.android.recyclerview.MainActivity">

   <android.support.design.widget.AppBarLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:theme="@style/AppTheme.AppBarOverlay">

      <android.support.v7.widget.Toolbar           android:id="@+id/toolbar"
android:layout_width="match_parent"
android:layout_height="?attr/actionBarSize"
android:background="?attr/colorPrimary"
app:popupTheme="@style/AppTheme.PopupOverlay" />

   </android.support.design.widget.AppBarLayout>

   <include layout="@layout/content_main" />

   <android.support.design.widget.FloatingActionButton
android:id="@+id/fab"        android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_gravity="bottom|end"
android:layout_margin="@dimen/fab_margin"
app:srcCompat="@drawable/ic_add_for_fab" />

</android.support.design.widget.CoordinatorLayout>
```

content_main.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"
   app:layout_behavior="@string/appbar_scrolling_view_behavior"
tools:context="com.example.android.recyclerview.MainActivity"
tools:showIn="@layout/activity_main">

   <android.support.v7.widget.RecyclerView         android:id="@+id/recyclerview"
android:layout_width="match_parent"
android:layout_height="match_parent">
</android.support.v7.widget.RecyclerView>

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

wordlist_item.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="wrap_content"
android:orientation="vertical"     android:padding="6dp">

   <TextView
       android:id="@+id/word"        style="@style/word_title"
/>

</LinearLayout>
```

MainActivity.java

```
package com.example.android.recyclerview;

import android.os.Bundle;
import android.support.design.widget.FloatingActionButton;
import android.support.v7.app.AppCompatActivity; import
android.support.v7.widget.LinearLayoutManager; import
android.support.v7.widget.RecyclerView; import
android.support.v7.widget.Toolbar; import android.view.Menu;
import android.view.MenuItem; import android.view.View;

import java.util.LinkedList;
```

```
/**
* Implements a basic RecyclerView that displays a list of generated words.
* - Clicking an item marks it as clicked.
* - Clicking the fab button adds a new word to the list.
 */
public class MainActivity extends AppCompatActivity {

   private final LinkedList<String> mWordList = new LinkedList<>();
    private RecyclerView mRecyclerView;
private WordListAdapter mAdapter;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);        Toolbar toolbar
= findViewById(R.id.toolbar);
setSupportActionBar(toolbar);

        FloatingActionButton fab = findViewById(R.id.fab);
fab.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {                int
wordListSize = mWordList.size();
                // Add a new word to the wordList.                mWordList.addLast("+ Word "
+ wordListSize);                // Notify the adapter, that the data has changed.
mRecyclerView.getAdapter().notifyItemInserted(wordListSize);
                // Scroll to the bottom.
mRecyclerView.smoothScrollToPosition(wordListSize);
            }
        });

        // Put initial data into the word list.        for (int i =
0; i < 20; i++) {            mWordList.addLast("Word " + i);
        }

        // Create recycler view.        mRecyclerView =
findViewById(R.id.recyclerview);        // Create an adapter and supply
the data to be displayed.
        mAdapter = new WordListAdapter(this, mWordList);
        // Connect the adapter with the recycler view.
        mRecyclerView.setAdapter(mAdapter);
        // Give the recycler view a default layout manager.
mRecyclerView.setLayoutManager(new LinearLayoutManager(this));
```

```
   }

   /**
* Inflates the menu, and adds items to the action bar if it is present.
    *
* @param menu Menu to inflate.
* @return Returns true if the menu inflated.
    */     @Override
   public boolean onCreateOptionsMenu(Menu menu) {
                  // Inflate the menu; this adds items to the action bar if it is present.
getMenuInflater().inflate(R.menu.menu_main, menu);        return true;
   }

   /**
* Handles app bar item clicks.
    *
* @param item Item clicked.
* @return True if one of the defined items was clicked.
    */     @Override
   public boolean onOptionsItemSelected(MenuItem item) {         // Handle
action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = item.getItemId();

        // This comment suppresses the Android Studio warning about simplifying
        // the return statements.
        //noinspection SimplifiableIfStatement         if (id
== R.id.action_settings) {            return true;
        }
        return super.onOptionsItemSelected(item);
   } }
```

WordListAdapter.java

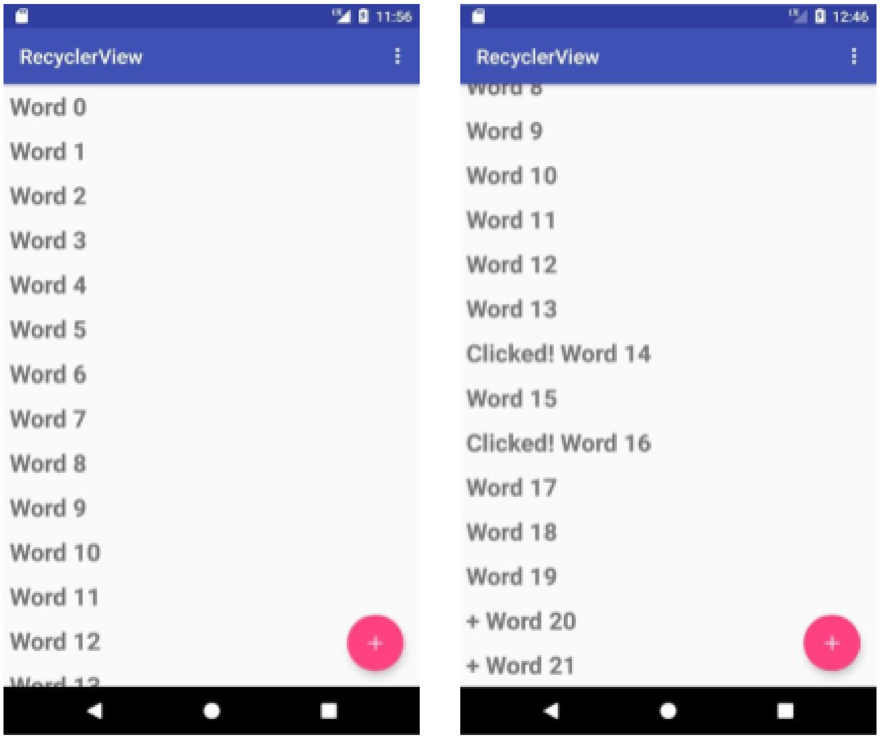
```
package com.example.android.recyclerview;

import android.content.Context;
import android.support.v7.widget.RecyclerView;
import android.view.LayoutInflater; import
android.view.View; import
android.view.ViewGroup; import
android.widget.TextView;
 import java.util.LinkedList;
```

```
/**
*                     Shows how to implement a simple Adapter for a RecyclerView.
*                     Demonstrates how to add a click handler for each item in the
                      ViewHolder.
 */
public class WordListAdapter extends
     RecyclerView.Adapter<WordListAdapter.WordViewHolder> {

   private final LinkedList<String> mWordList;    private final
LayoutInflater mInflater;

   class WordViewHolder extends RecyclerView.ViewHolder
         implements View.OnClickListener {        public
final TextView wordItemView;        final
WordListAdapter mAdapter;

      /**
*                     Creates a new custom view holder to hold the view to display in
*                     the RecyclerView.
       *
*                     @param itemView The view in which to display the data.
*                     @param adapter The adapter that manages the the data and views
*                     for the RecyclerView.
       */
      public WordViewHolder(View itemView, WordListAdapter adapter) {
super(itemView);
         wordItemView = itemView.findViewById(R.id.word);
this.mAdapter = adapter;          itemView.setOnClickListener(this);
      }

      @Override
      public void onClick(View view) {
         // Get the position of the item that was clicked.          int
mPosition = getLayoutPosition();

         // Use that to access the affected item in mWordList.          String
element = mWordList.get(mPosition);          // Change the word in the
mWordList.

         mWordList.set(mPosition, "Clicked! " + element);          // Notify the
adapter, that the data has changed so it can
         // update the RecyclerView to display the data.
mAdapter.notifyDataSetChanged();
```

```
        }
    }
    public WordListAdapter(Context context, LinkedList<String> wordList) {
mInflater = LayoutInflater.from(context);          this.mWordList = wordList;
    }

    /**
*                              Called when RecyclerView needs a new ViewHolder of the given
                               type to
*                              represent an item.
     *
*                              This new ViewHolder should be constructed with a new View that
                               can
*                              represent the items of the given type. You can either create a new
                               View
*                              manually or inflate it from an XML layout file.
     *
*                              The new ViewHolder will be used to display items of the adapter
                               using
*                              onBindViewHolder(ViewHolder, int, List). Since it will be reused to
*                              display different items in the data set, it is a good idea to cache
*                              references to sub views of the View to avoid unnecessary
                               findViewById()
*                              calls.
     *
*                              @param parent   The ViewGroup into which the new View will be
                               added after
*                              it is bound to an adapter position.
*                              @param viewType The view type of the new View. @return A new
                               ViewHolder
*                              that holds a View of the given view type.
     */     @Override
        public WordListAdapter.WordViewHolder onCreateViewHolder(ViewGroup parent,
                                                                  int viewType) {
        // Inflate an item view.
        View mItemView = mInflater.inflate(
                R.layout.wordlist_item, parent, false);          return new
WordViewHolder(mItemView, this);
    }

    /**
*                              Called by RecyclerView to display the data at the specified position.
                               * This method should update the contents of the
                               ViewHolder.itemView to
```

```
*                    reflect the item at the given position.
   *
*                    @param holder   The ViewHolder which should be updated to
                     represent
*                    the contents of the item at the given position in the
*                    data set.
*                    @param position The position of the item within the adapter's data
                     set.
   */    @Override
  public void onBindViewHolder(WordListAdapter.WordViewHolder holder,
int position) {
      // Retrieve the data for that position.
      String mCurrent = mWordList.get(position);
      // Add the data to the view holder.        holder.wordItemView.setText(mCurrent);
  }

  /**
*                    Returns the total number of items in the data set held by the adapter.
   *
*                    @return The total number of items in this adapter.
   */    @Override
  public int getItemCount() {        return
mWordList.size();
  } }
```

Output:



11:56

RecyclerView

Word 0
Word 1
Word 2
Word 3
Word 4
Word 5
Word 6
Word 7
Word 8
Word 9
Word 10
Word 11
Word 12
Word 13

12:46

RecyclerView

Word 8
Word 9
Word 10
Word 11
Word 12
Word 13
Clicked! Word 14
Word 15
Clicked! Word 16
Word 17
Word 18
Word 19
+ Word 20
+ Word 21

Practical: 7

Practical: Theme, Custom Styles, Drawables

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:orientation="vertical"     android:padding="16dp"
   tools:context="com.example.android.scorekeeper.MainActivity">

   <RelativeLayout
       android:layout_width="match_parent"
android:layout_height="0dp"        android:layout_weight="1">

       <TextView
           android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentTop="true"
android:layout_centerHorizontal="true"
android:text="@string/team_1"            style="@style/TeamText" />

       <ImageButton
           android:id="@+id/decreaseTeam1"
android:layout_width="@dimen/button_size"
android:layout_height="@dimen/button_size"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_centerVertical="true"            style="@style/MinusButtons"
android:onClick="decreaseScore"/>

       <TextView
           android:id="@+id/score_1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_centerHorizontal="true"
android:layout_centerVertical="true"
android:text="@string/initial_count"            style="@style/ScoreText" />

       <ImageButton
           android:id="@+id/increaseTeam1"
android:layout_width="@dimen/button_size"
android:layout_height="@dimen/button_size"
android:layout_alignParentEnd="true"
```

```
android:layout_alignParentRight="true"
android:layout_centerVertical="true"            style="@style/PlusButtons"
android:onClick="increaseScore"/>

    </RelativeLayout>

    <RelativeLayout
        android:layout_width="match_parent"
android:layout_height="0dp"        android:layout_weight="1">

        <TextView
            android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentTop="true"
android:layout_centerHorizontal="true"
android:text="@string/team_2"            style="@style/TeamText" />

        <ImageButton
            android:id="@+id/decreaseTeam2"
android:layout_width="@dimen/button_size"
android:layout_height="@dimen/button_size"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_centerVertical="true"            style="@style/MinusButtons"
android:onClick="decreaseScore"/>

        <TextView            android:id="@+id/score_2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_centerHorizontal="true"
android:layout_centerVertical="true"
android:text="@string/initial_count"
style="@style/ScoreText" />

        <ImageButton
            android:id="@+id/increaseTeam2"
android:layout_width="@dimen/button_size"
android:layout_height="@dimen/button_size"
android:layout_alignParentEnd="true"
android:layout_alignParentRight="true"
android:layout_centerVertical="true"            style="@style/PlusButtons"
android:onClick="increaseScore"/>
    </RelativeLayout>

</LinearLayout>
```

MainActivity.java

```
package com.example.android.scorekeeper;

import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.support.v7.app.AppCompatDelegate;
import android.view.Menu; import
android.view.MenuItem; import android.view.View;
import android.widget.TextView;

/***
 * Main Activity for the Scorekeeper app, which keeps score for any game  *
involving two teams. The user can increment or decrement the score  * for each
team using Button views.
 */
public class MainActivity extends AppCompatActivity {

   // Member variables for holding the score
private int mScore1;     private int mScore2;

   // Member variables for the two score TextView elements
private TextView mScoreText1;     private TextView mScoreText2;

   // Tags to be used as the keys in OnSavedInstanceState     static final
String STATE_SCORE_1 = "Team 1 Score";     static final String
STATE_SCORE_2 = "Team 2 Score";

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

       //Find the TextViews by ID        mScoreText1 =
findViewById(R.id.score_1);        mScoreText2 =
findViewById(R.id.score_2);

       // Restores the scores if there is savedInstanceState.        if
(savedInstanceState != null) {
                   mScore1 = savedInstanceState.getInt(STATE_SCORE_1);
              mScore2 = savedInstanceState.getInt(STATE_SCORE_2);

          //Set the score text views
          mScoreText1.setText(String.valueOf(mScore1));
mScoreText2.setText(String.valueOf(mScore2));
       }
   }

   /**
* Handles the onClick of both the decrement buttons.
    *
* @param view The button view that was clicked
    */
   public void decreaseScore(View view) {         // Get the
ID of the button that was clicked.         int viewID =
view.getId();        switch (viewID) {            // If it was on
Team 1:            case R.id.decreaseTeam1:
             // Decrement the score and update the TextView.                mScore1--;
             mScoreText1.setText(String.valueOf(mScore1));
break;           // If it was Team 2:            case R.id.decreaseTeam2:
             // Decrement the score and update the TextView.                mScore2--;
             mScoreText2.setText(String.valueOf(mScore2));
       }
   }

   /**
* Handles the onClick of both the increment buttons.
    *
* @param view The button view that was clicked
    */
   public void increaseScore(View view) {         // Get the ID
of the button that was clicked.         int viewID =
view.getId();        switch (viewID) {            // If it was on
Team 1:            case R.id.increaseTeam1:
             // Increment the score and update the TextView.                mScore1++;
             mScoreText1.setText(String.valueOf(mScore1));
break;           // If it was Team 2:            case R.id.increaseTeam2:
             // Increment the score and update the TextView.                mScore2++;
             mScoreText2.setText(String.valueOf(mScore2));
       }
   }

   /**
* Creates the night mode menu option.
    *
* @param menu The menu in the action bar
* @return True to display the menu, false to hide it
    */    @Override
   public boolean onCreateOptionsMenu(Menu menu) {
getMenuInflater().inflate(R.menu.main_menu, menu);        // Change the label of the
menu based on the state of the app.
       int nightMode = AppCompatDelegate.getDefaultNightMode();        if(nightMode
== AppCompatDelegate.MODE_NIGHT_YES){
           menu.findItem(R.id.night_mode).setTitle(R.string.day_mode);
       } else{
           menu.findItem(R.id.night_mode).setTitle(R.string.night_mode);
       }
       return true;
   }


   /**
* Handles options menu item clicks.
    *
* @param item The item that was pressed
* @return returns true since the item click wa handled
    */     @Override
   public boolean onOptionsItemSelected(MenuItem item) {
       // Check if the correct item was clicked.        if (item.getItemId() ==
R.id.night_mode) {           // Get the night mode state of the app.           int
nightMode = AppCompatDelegate.getDefaultNightMode();
           // Set the theme mode for the restarted activity.           if
(nightMode == AppCompatDelegate.MODE_NIGHT_YES) {
               AppCompatDelegate.setDefaultNightMode
                       (AppCompatDelegate.MODE_NIGHT_NO);
           } else {
               AppCompatDelegate.setDefaultNightMode
                       (AppCompatDelegate.MODE_NIGHT_YES);
           }
           // Recreate the activity for the theme change to take effect.           recreate();
       }
       return true;
   }

   /**
* Method that is called when the configuration changes,
* used to preserve the state of the app.
    *
* @param outState The bundle that will be passed in to the Activity when it is restored.
   */    @Override
   protected void onSaveInstanceState(Bundle outState) {
        // Save the scores.          outState.putInt(STATE_SCORE_1,
mScore1);          outState.putInt(STATE_SCORE_2, mScore2);
super.onSaveInstanceState(outState);
    } }
```

menu/main_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/night_mode"         android:title="@string/night_mode"/>
</menu>
```

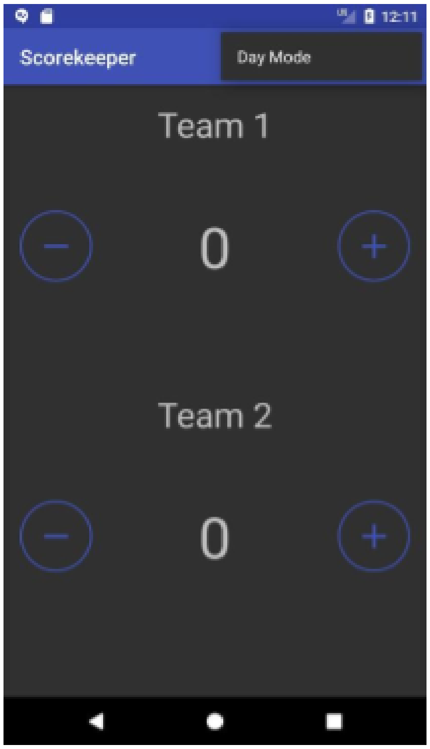
styles.xml

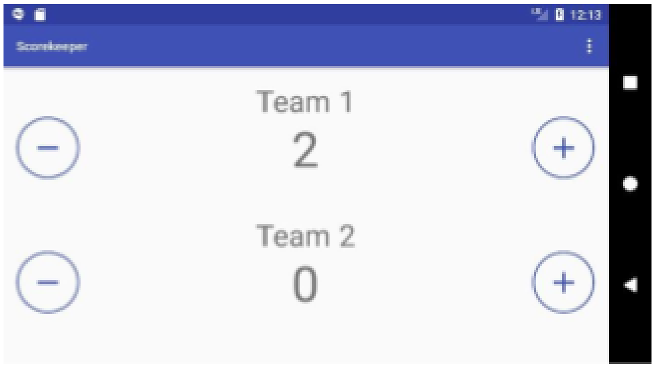
```
<resources>

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

    <style name="ScoreButtons" parent="Widget.AppCompat.Button">
        <item name="android:background">@drawable/button_background</item>
        <item name="android:tint">@color/colorPrimary</item>
    </style>

    <style name="PlusButtons" parent="ScoreButtons">
        <item name="android:src">@drawable/ic_plus</item>
        <item name="android:contentDescription">
            @string/plus_button_description
        </item>
    </style>

    <style name="MinusButtons" parent="ScoreButtons">
        <item name="android:src">@drawable/ic_minus</item>
        <item name="android:contentDescription">
            @string/minus_button_description
        </item>
    </style>

    <style name="ScoreText">
    <item name="android:textAppearance">
      @style/TextAppearance.AppCompat.Display3
    </item>
  </style>

  <style name="TeamText">
    <item name="android:textAppearance">
      @style/TextAppearance.AppCompat.Display1
    </item>
  </style>

</resources>
```

strings.xml

```
<resources>
  <string name="app_name">Scorekeeper</string>
  <string name="team_1">Team 1</string>
  <string name="team_2">Team 2</string>
  <string name="initial_count">0</string>
  <string name="minus_button_description">Minus Button</string>
  <string name="plus_button_description">Plus Button</string>
  <string name="night_mode">Night Mode</string>
  <string name="day_mode">Day Mode</string>
</resources>
```

Output:


12:11
Scorekeeper
Day Mode
Team 1
0
Team 2
0


12:13
Scorekeeper
Team 1
2
Team 2
0

Practical: 8

Practical: Save user data in a database

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="match_parent"
android:orientation="vertical"     tools:context=".MainActivity">

   <TextView
       android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:text="SQLite
Database"        android:textSize="30sp"
       app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent" />
    <Button
       android:id="@+id/add_contact"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Add
Contact" />
    <Button
       android:id="@+id/update_contact"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Update
Contact" />
    <Button
       android:id="@+id/delete_contact"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Delete
Contact" />
    <Button
       android:id="@+id/get_contact"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Get
Contact" />
    <Button
       android:id="@+id/all_contacts"        android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Get all Contacts" />

</LinearLayout>
```

```
MainActivity.java package
com.example.sqlitedemoapp;

import androidx.appcompat.app.AppCompatActivity;
 import android.content.Intent;
import android.os.Bundle; import
android.util.Log; import
android.view.View; import
android.widget.Button;
 import java.io.FileNotFoundException;
import java.io.FileOutputStream; import
java.io.OutputStreamWriter; import
java.util.List;

public class MainActivity extends AppCompatActivity {

    Button add, update, delete, get, getall;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);
         add = findViewById(R.id.add_contact);         update
= findViewById(R.id.update_contact);         delete =
findViewById(R.id.delete_contact);         get =
findViewById(R.id.get_contact);         getall =
findViewById(R.id.all_contacts);

        add.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent i = new Intent(MainActivity.this, AddContactActivity.class);
startActivity(i);
            }         });
        update.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent i = new Intent(MainActivity.this,
UpdateContactActivity.class);                 startActivity(i);
            }         });
        delete.setOnClickListener(new View.OnClickListener() {            @Override
            public void onClick(View v) {
                Intent i = new Intent(MainActivity.this,
DeleteContactActivity.class);                 startActivity(i);
            }         });
        get.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent i = new Intent(MainActivity.this, GetContactActivity.class);
startActivity(i);
            }         });
        getall.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent i = new Intent(MainActivity.this,
GetAllContactActivity.class);                 startActivity(i);
            }
        });

    } }
```

Contact.java package

```
com.example.sqlitedemoapp;


    public class Contact {          int
_id;         String _name;
String _phone_number;
public Contact(){   }
        public Contact(int id, String name, String _phone_number){
this._id = id;              this._name = name;
            this._phone_number = _phone_number;
        }
        public Contact(String name, String _phone_number){              this._name
= name;
            this._phone_number = _phone_number;
        }
        public int getID(){            return
this._id;
        }
        public void setID(int id){            this._id =
id;
        }

        public String getName(){            return
this._name;
        }
        public void setName(String name){
this._name = name;
```

```
    }         public String
getPhoneNumber(){            return
this._phone_number;
    }
    public void setPhoneNumber(String phone_number){
this._phone_number = phone_number;
    }    }
```

DatabaseHandler.java

```
package
com.example.sqlitedemoapp;
 import android.content.ContentValues;
import android.content.Context; import
android.database.Cursor;
import android.database.sqlite.SQLiteDatabase; import
android.database.sqlite.SQLiteOpenHelper;
import java.util.ArrayList; import
java.util.List;
  public class DatabaseHandler extends SQLiteOpenHelper {
private static final int DATABASE_VERSION = 1;
   private static final String DATABASE_NAME = "contactsManager";
private static final String TABLE_CONTACTS = "contacts";     private static
final String KEY_ID = "id";     private static final String KEY_NAME =
"name";     private static final String KEY_PH_NO = "phone_number";

   public DatabaseHandler(Context context) {
       super(context, DATABASE_NAME, null, DATABASE_VERSION);
       //3rd argument to be passed is CursorFactory instance
   }

   // Creating Tables     @Override
   public void onCreate(SQLiteDatabase db) {
       String CREATE_CONTACTS_TABLE = "CREATE TABLE " +
TABLE_CONTACTS + "("
              + KEY_ID + " INTEGER PRIMARY KEY AUTOINCREMENT," + KEY_NAME + "
TEXT,"
              + KEY_PH_NO + " TEXT" + ")";
db.execSQL(CREATE_CONTACTS_TABLE);
   }

   // Upgrading database
   @Override
   public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
       // Drop older table if existed
       db.execSQL("DROP TABLE IF EXISTS " + TABLE_CONTACTS);
```

```
          // Create tables again         onCreate(db);
     }

     // code to add the new contact      long
addContact(Contact contact) {
          SQLiteDatabase db = this.getWritableDatabase();

          ContentValues values = new ContentValues();         values.put(KEY_NAME,
contact.getName()); // Contact Name         values.put(KEY_PH_NO,
contact.getPhoneNumber()); // Contact Phone

          // Inserting Row
          long id =  db.insert(TABLE_CONTACTS, null, values);
//2nd argument is String containing nullColumnHack
db.close(); // Closing database connection         return id;
     }

     // code to get the single contact
     Contact getContact(int id) {
          SQLiteDatabase db = this.getReadableDatabase();

          Cursor cursor = db.query(TABLE_CONTACTS, new String[] { KEY_ID,
KEY_NAME, KEY_PH_NO }, KEY_ID + "=?",
                new String[] { String.valueOf(id) }, null, null, null, null);         if (cursor !=
null)            cursor.moveToFirst();

          Contact contact = new Contact(Integer.parseInt(cursor.getString(0)),
cursor.getString(1), cursor.getString(2));
          // return contact         return
contact;
     }

     // code to get all contacts in a list view      public
List<Contact> getAllContacts() {
          List<Contact> contactList = new ArrayList<Contact>();
          // Select All Query
          String selectQuery = "SELECT  * FROM " + TABLE_CONTACTS;

          SQLiteDatabase db = this.getWritableDatabase();
          Cursor cursor = db.rawQuery(selectQuery, null);
          // looping through all rows and adding to list         if
(cursor.moveToFirst()) {            do {
                Contact contact = new Contact();
```

```
            contact.setID(Integer.parseInt(cursor.getString(0)));
contact.setName(cursor.getString(1));               contact.setPhoneNumber(cursor.getString(2));
            // Adding contact to list
contactList.add(contact);           } while
(cursor.moveToNext());
      }

      // return contact list        return
contactList;
   }

   // code to update the single contact     public int
updateContact(Contact contact) {        SQLiteDatabase db =
this.getWritableDatabase();

      ContentValues values = new ContentValues();
values.put(KEY_NAME, contact.getName());        values.put(KEY_PH_NO,
contact.getPhoneNumber());

      // updating row
      return db.update(TABLE_CONTACTS, values, KEY_ID + " = ?",
new String[] { String.valueOf(contact.getID()) });
   }

   // Deleting single contact     public void
deleteContact(int id) {
      SQLiteDatabase db = this.getWritableDatabase();
db.delete(TABLE_CONTACTS, KEY_ID + " = ?",
new String[] { String.valueOf(id) });        db.close();
   }

   // Getting contacts Count     public int
getContactsCount() {
      String countQuery = "SELECT  * FROM " + TABLE_CONTACTS;
      SQLiteDatabase db = this.getReadableDatabase();        Cursor
cursor = db.rawQuery(countQuery, null);        cursor.close();

      // return count        return
cursor.getCount();
   }

}
```

activity_add_contact.xml

```
<?xml version="1.0" encoding="utf-8"?>
```

```
<androidx.constraintlayout.widget.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=".AddContactActivity">
    <EditText        android:id="@+id/name"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:ems="10"        android:hint="Enter name"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.202"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.118" />
    <EditText        android:id="@+id/phno"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:ems="10"        android:hint="Enter phone number"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.202"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.273" />
    <Button
       android:id="@+id/add_button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:text="Add
Contact"        app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.141"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.427" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

AddContactActivity.java package
com.example.sqlitedemoapp;

```
import androidx.appcompat.app.AppCompatActivity;
```

```
 import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class AddContactActivity extends AppCompatActivity {

   EditText name, phno;
   Button b;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
       setContentView(R.layout.activity_add_contact);
        name = findViewById(R.id.name);
phno = findViewById(R.id.phno);         b =
findViewById(R.id.add_button);

       DatabaseHandler db = new DatabaseHandler(this);
       b.setOnClickListener(new View.OnClickListener() {
@Override
           public void onClick(View v) {                try
{
                   long id = db.addContact(new Contact(name.getText().toString(),
phno.getText().toString()));

                   Toast.makeText(getApplicationContext(), "Your contact has been saved successfully
with ID: " + id, Toast.LENGTH_SHORT).show();
               }catch(Exception e){
                   e.printStackTrace();
               }
           }
       });

   } }
```

activity_delete_contact.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.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=".DeleteContactActivity">
```

```
   <EditText
       android:id="@+id/edit_id"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:ems="10"
       android:hint="Enter Contact ID" android:inputType="textPersonName"
             app:layout_constraintBottom_toBottomOf="parent"
       app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.297"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.113" />
    <Button
       android:id="@+id/delete_button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:text="Delete
Contact"
       app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.226"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.225" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

<u>DeleteContactActivity.java</u> package com.example.sqlitedemoapp;

```
import androidx.appcompat.app.AppCompatActivity;
 import android.content.Intent;
import android.os.Bundle; import
android.view.View; import
android.widget.Button; import
android.widget.EditText; import
android.widget.Toast;

public class DeleteContactActivity extends AppCompatActivity {

   EditText id;
   Button b;

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

```
      id = findViewById(R.id.edit_id);         b =
findViewById(R.id.delete_button);

        DatabaseHandler db = new DatabaseHandler(this);

        b.setOnClickListener(new View.OnClickListener() {
@Override
            public void onClick(View v) {
                int cid = Integer.parseInt(id.getText().toString());

                try{
                    db.deleteContact(cid);
                    Toast.makeText(getApplicationContext(), "Contact has been deleted with ID: " + cid,
Toast.LENGTH_SHORT).show();
                }catch(Exception e){
                    e.printStackTrace();
                }
            }
        });
    } }
```

activity_update_contact.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.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=".UpdateContactActivity">

    <EditText
        android:id="@+id/id_edit"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:ems="10"
        android:hint="Enter Contact ID"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.181"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.083" />

    <EditText
```

```
        android:id="@+id/name_edit"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:ems="10"        android:hint="Enter name"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.181"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.217" />

    <EditText
        android:id="@+id/phno_edit"        android:layout_width="wrap_content"
android:layout_height="wrap_content" android:ems="10"
        android:hint="Enter phone number"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.181"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.349" />
     <Button
        android:id="@+id/update_button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:text="Update
Contact"        app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.111"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.484" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

UpdateContactActivity.java package com.example.sqlitedemoapp;

```
import androidx.appcompat.app.AppCompatActivity;
 import android.os.Bundle; import
android.view.View; import
android.widget.Button; import
android.widget.EditText; import
android.widget.Toast;

public class UpdateContactActivity extends AppCompatActivity {
   EditText id_edit, name_edit, phno_edit;
   Button update;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_update_contact);
       id_edit = findViewById(R.id.id_edit);
name_edit = findViewById(R.id.name_edit);
phno_edit = findViewById(R.id.phno_edit);        update
= findViewById(R.id.update_button);

      DatabaseHandler db = new DatabaseHandler(this);
       update.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            int cid = Integer.parseInt(id_edit.getText().toString());
            String cname = name_edit.getText().toString();              String
cphno = phno_edit.getText().toString();

            try{
                                    int id = db.updateContact(new Contact(cid, cname, cphno));
Toast.makeText(getApplicationContext(), "Contact has been updated with ID: " + id,
Toast.LENGTH_SHORT).show();

            }catch(Exception e){
               e.printStackTrace();
            }
         }
      });
   } }
```

activity_get_contact.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.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=".GetContactActivity">

   <EditText
```

```
        android:id="@+id/edit_id_get"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:ems="10"
        android:hint="Enter Contact ID"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.257"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.074" />

    <Button
        android:id="@+id/button_get"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:text="Get
Contact"
        app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.179"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.203" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

GetContactActivity.java

```
package com.example.sqlitedemoapp;

import androidx.appcompat.app.AppCompatActivity;
 import android.os.Bundle; import
android.view.View; import
android.widget.Button; import
android.widget.EditText; import
android.widget.Toast;

public class GetContactActivity extends AppCompatActivity {

    EditText id;
    Button b;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_get_contact);
        id = findViewById(R.id.edit_id_get);         b
= findViewById(R.id.button_get);

       DatabaseHandler db = new DatabaseHandler(this);

       b.setOnClickListener(new View.OnClickListener() {
@Override
          public void onClick(View v) {
             int cid =  Integer.parseInt(id.getText().toString());               try {
                Contact c = db.getContact(cid);
                Toast.makeText(getApplicationContext(), "Name: " + c.getName() +
"\n" + "Phone number: " + c.getPhoneNumber(), Toast.LENGTH_SHORT).show();
             }catch(Exception e){
                Toast.makeText(getApplicationContext(), "Not found",
Toast.LENGTH_SHORT).show();
             }
          }
       });
    } }
```

activity_get_all_contact.xml

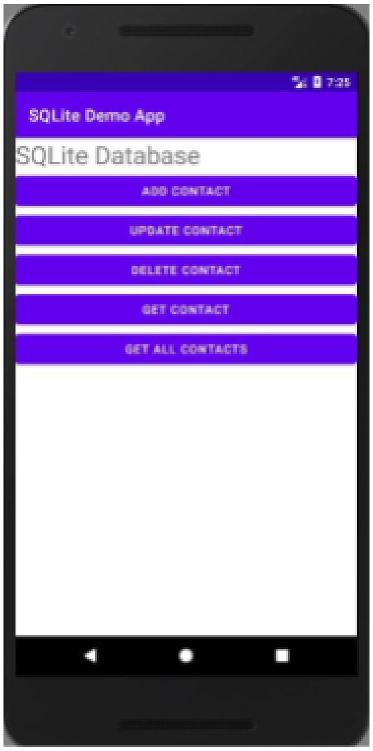
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"     android:layout_height="match_parent"
tools:context=".GetAllContactActivity">
    <Button
       android:id="@+id/button_getall"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:text="Get All
Contacts"        app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.164"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.087" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

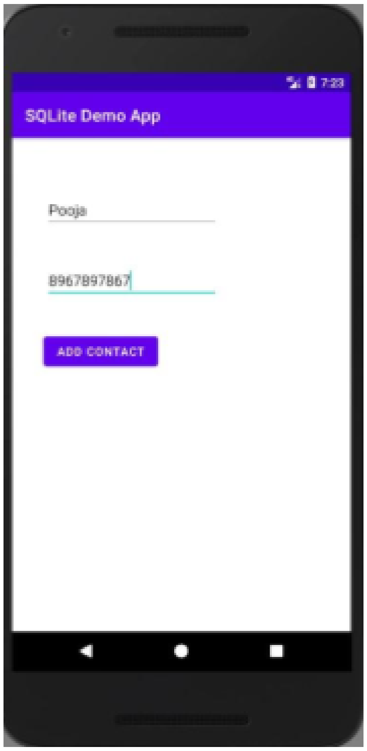
GetAllContactActivity.java package com.example.sqlitedemoapp;

```
import androidx.appcompat.app.AppCompatActivity;
```

```
 import android.os.Bundle; import
android.util.Log; import
android.view.View; import
android.widget.Button; import
android.widget.TextView; import
android.widget.Toast;
 import java.util.ArrayList;
import java.util.List;

public class GetAllContactActivity extends AppCompatActivity {

    Button b;

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

b  = findViewById(R.id.button_getall);

        DatabaseHandler db = new DatabaseHandler(this);

        b.setOnClickListener(new View.OnClickListener() {
@Override
            public void onClick(View v) {
String c = "";                try{
                    List<Contact> contacts = db.getAllContacts();

                    for (Contact cn : contacts) {
c  = "Id: " + cn.getID() + ", Name: " + cn.getName() + ", Phone: " +
                            cn.getPhoneNumber();
                        Toast.makeText(getApplicationContext(), c,
Toast.LENGTH_SHORT).show();
                    }
                }catch(Exception e){
                    e.printStackTrace();
                }
            }
        });
    } }
```

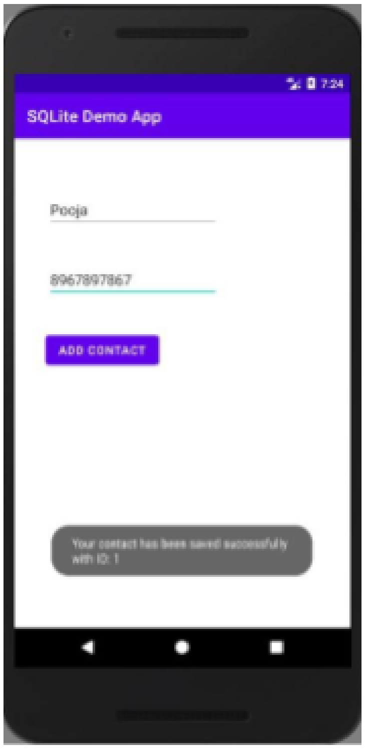
Output:





Pooja

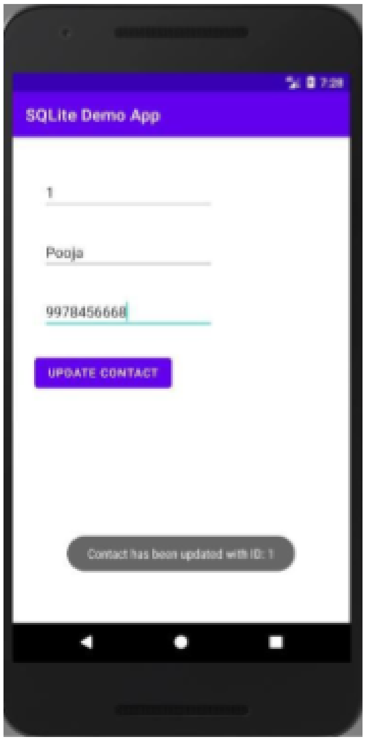
8967897867



Pooja

8967897867

Your contact has been saved successfully with ID: 1

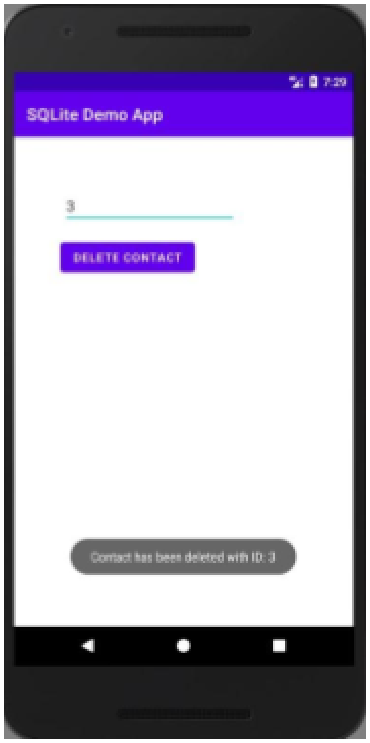


1

Pooja

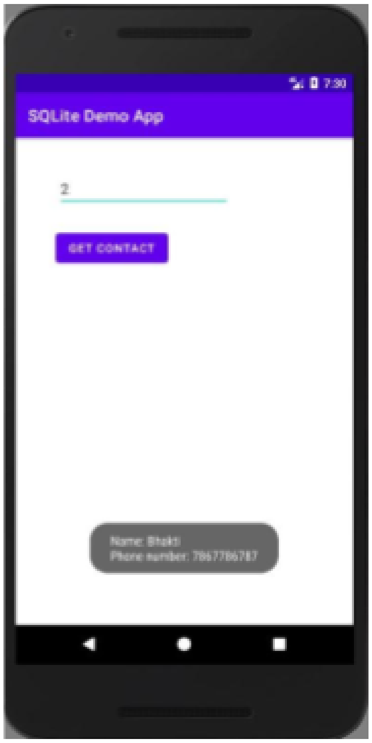
9978456668

Contact has been updated with ID: 1



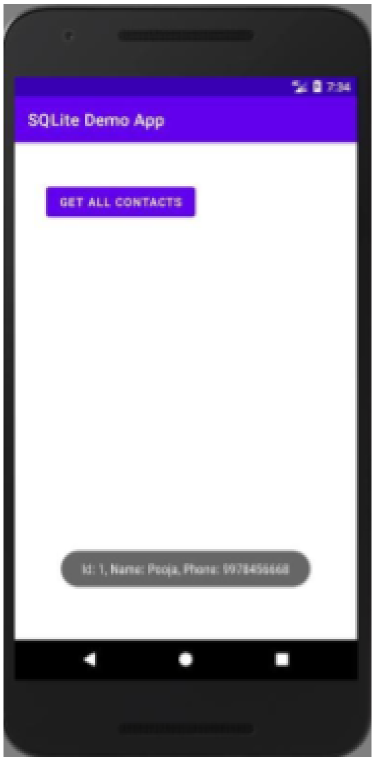
3

Contact has been deleted with ID: 3

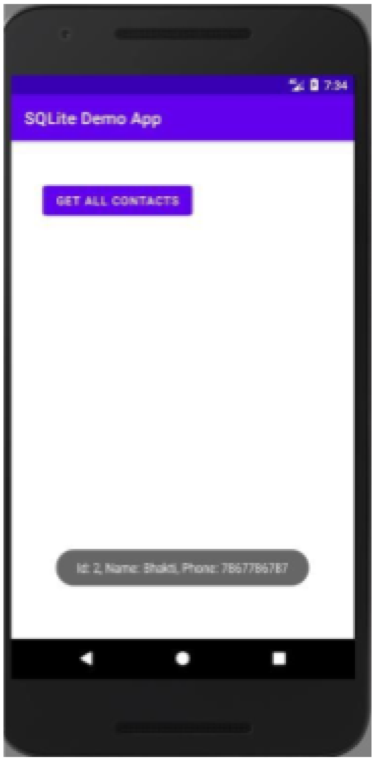


2

Name: Bhakti
Phone number: 7867786787



```
Id: 1, Name: Pooja, Phone: 9978456668
```



```
Id: 2, Name: Bhakti, Phone: 7867786787
```

Practical: 9

Practical: Use an AsyncTask to access remote database

activity_main.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:layout_margin="16dp"     tools:context=".MainActivity">

   <TextView
       android:id="@+id/instructions"        android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="@string/instructions"
       android:textAppearance="@style/TextAppearance.AppCompat.Title"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"/>

   <EditText
       android:id="@+id/bookInput"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="8dp"        android:hint="@string/input_hint"
android:inputType="text"
       app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/instructions"/>
    <Button
       android:id="@+id/searchButton"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="8dp"        android:onClick="searchBooks"
android:text="@string/button_text"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/bookInput"/>

   <TextView
       android:id="@+id/titleText"        android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginTop="16dp"
android:textAppearance="@style/TextAppearance.AppCompat.Headline"
app:layout_constraintStart_toStartOf="parent"
       app:layout_constraintTop_toBottomOf="@+id/searchButton"/>
   <TextView
       android:id="@+id/authorText"         android:layout_width="wrap_content"
android:layout_height="wrap_content"         android:layout_marginTop="8dp"
       android:textAppearance="@style/TextAppearance.AppCompat.Headline"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/titleText"/>

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

NetworkUtils.java

```
package com.example.android.whowroteit;
 import android.net.Uri;
import android.util.Log;
 import java.io.BufferedReader;
import java.io.IOException; import
java.io.InputStream; import
java.io.InputStreamReader; import
java.net.HttpURLConnection; import
java.net.URL;

/**
 * Utility class for using the Google Book Search API to download book  *
information.
 */
public class NetworkUtils {

   private static final String LOG_TAG = NetworkUtils.class.getSimpleName();
   // Constants for the various components of the Books API request.
   //
   // Base endpoint URL for the Books API.     private
static final String BOOK_BASE_URL =
          "https://www.googleapis.com/books/v1/volumes?";
   // Parameter for the search string.     private static
final String QUERY_PARAM = "q";
   // Parameter that limits search results.
   private static final String MAX_RESULTS = "maxResults";
   // Parameter to filter by print type.
   private static final String PRINT_TYPE = "printType";


   /**
*  Static method to make the actual query to the Books API.
    *
```

```
* @param queryString the query string.
* @return the JSON response string from the query.
   */
  static String getBookInfo(String queryString) {

    // Set up variables for the try block that need to be closed in the
    // finally block.
    HttpURLConnection urlConnection = null;
    BufferedReader reader = null;
    String bookJSONString = null;

    try {
      // Build the full query URI, limiting results to 10 items and
      // printed books.
      Uri builtURI = Uri.parse(BOOK_BASE_URL).buildUpon()
          .appendQueryParameter(QUERY_PARAM, queryString)
          .appendQueryParameter(MAX_RESULTS, "10")
          .appendQueryParameter(PRINT_TYPE, "books")
          .build();

      // Convert the URI to a URL,
      URL requestURL = new URL(builtURI.toString());

      // Open the network connection.         urlConnection =
(HttpURLConnection) requestURL.openConnection();
urlConnection.setRequestMethod("GET");         urlConnection.connect();

      // Get the InputStream.
      InputStream inputStream = urlConnection.getInputStream();

      // Create a buffered reader from that input stream.         reader = new
BufferedReader(new InputStreamReader(inputStream));
      // Use a StringBuilder to hold the incoming response.
      StringBuilder builder = new StringBuilder();

      String line;
      while ((line = reader.readLine()) != null) {
        // Add the current line to the string.          builder.append(line);

        // Since this is JSON, adding a newline isn't necessary (it won't          // affect
parsing) but it does make debugging a *lot* easier
        // if you print out the completed buffer for debugging.
builder.append("\n");
      }
```

```
             if (builder.length() == 0) {
               // Stream was empty.  Exit without parsing.                return null;
            }

            bookJSONString = builder.toString();

        } catch (IOException e) {
            e.printStackTrace();
        } finally {
            // Close the connection and the buffered reader.              if
(urlConnection != null) {                 urlConnection.disconnect();
            }
            if (reader != null) {                 try {
                    reader.close();                 } catch
(IOException e) {
                    e.printStackTrace();
                }
            }
        }

        // Write the final JSON response to the log
        Log.d(LOG_TAG, bookJSONString);

        return bookJSONString;
    } }
```

FetchBook.java

```
package com.example.android.whowroteit;
 import android.os.AsyncTask;
import android.widget.TextView;
 import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;
 import java.lang.ref.WeakReference;

/**
 * FetchBook is an AsyncTask implementation that opens a network connection  * and
queryies the Book Service API.
 */
public class FetchBook extends AsyncTask<String, Void, String> {

    // Variables for the results TextViews.
    // These are WeakReferences to prevent "leaky context" -- weak references
```

```
   // enable the activity to be garbage collected if it is not needed.
   private WeakReference<TextView> mTitleText;     private
WeakReference<TextView> mAuthorText;

   // Constructor, provides references to the views in MainActivity.
   FetchBook(TextView titleText, TextView authorText) {        this.mTitleText =
new WeakReference<>(titleText);         this.mAuthorText = new
WeakReference<>(authorText);
   }

   /**
*              Use the getBookInfo() method in the NetworkUtils class to make
*              the connection in the background.
    *
*              @param strings String array containing the search data.      * @return
               Returns the JSON string from the Books API, or
*              null if the connection failed.
    */    @Override
   protected String doInBackground(String... strings) {        return
NetworkUtils.getBookInfo(strings[0]);
   }

   /**
*              Handles the results on the UI thread. Gets the information from
*              the JSON result and updates the views.
    *
*              @param s Result from the doInBackground() method containing the raw
*              JSON response, or null if it failed.
    */    @Override
   protected void onPostExecute(String s) {        super.onPostExecute(s);
       try {
          // Convert the response into a JSON object.            JSONObject
jsonObject = new JSONObject(s);
          // Get the JSONArray of book items.
          JSONArray itemsArray = jsonObject.getJSONArray("items");

          // Initialize iterator and results fields.
          int i = 0;           String title =
null;
          String authors = null;

          // Look for results in the items array, exiting when both the            // title and
author are found or when all items have been checked.
          while (i < itemsArray.length() &&
          (authors == null && title == null)) {
        // Get the current item information.
        JSONObject book = itemsArray.getJSONObject(i);
        JSONObject volumeInfo = book.getJSONObject("volumeInfo");

        // Try to get the author and title from the current item,
        // catch if either field is empty and move on.                try {
          title = volumeInfo.getString("title");                    authors =
volumeInfo.getString("authors");                } catch (JSONException e) {
          e.printStackTrace();
        }

        // Move to the next item.                i++;
      }

      // If both are found, display the result.            if (title !=
null && authors != null) {
mTitleText.get().setText(title);
mAuthorText.get().setText(authors);
      } else {
        // If none are found, update the UI to show failed results.
        mTitleText.get().setText(R.string.no_results);
mAuthorText.get().setText("");
      }

    } catch (Exception e) {
      // If onPostExecute() does not receive a proper JSON string,
      // update the UI to show failed results.
      mTitleText.get().setText(R.string.no_results);
      mAuthorText.get().setText("");
      e.printStackTrace();
    }

  } }
```

ActivityMain.java

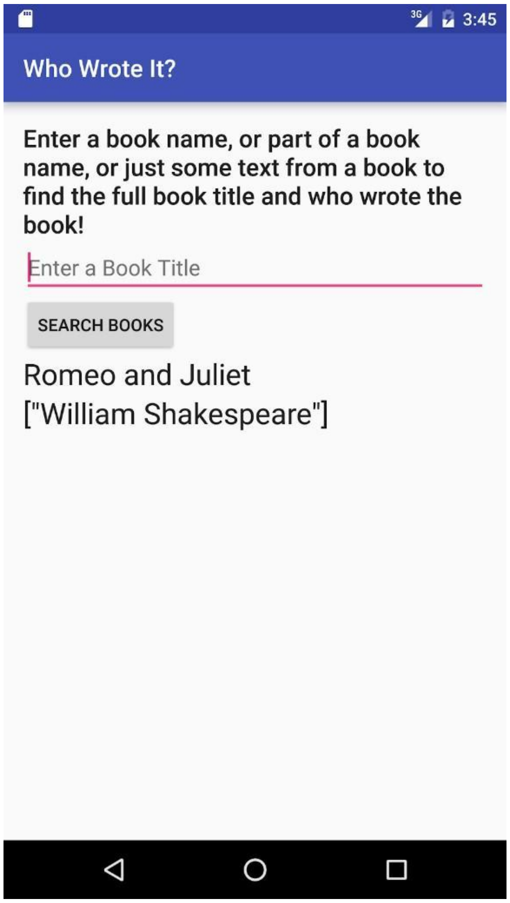
```
package com.example.android.whowroteit;
 import android.content.Context; import
android.net.ConnectivityManager; import
android.net.NetworkInfo;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle; import android.view.View;
import android.view.inputmethod.InputMethodManager;
import android.widget.EditText; import
android.widget.TextView;
```

```
/**
* The WhoWroteIt app queries the Book Search API for books based
* on a user's search. It uses an AsyncTask to run the search task in  * the
  background.
 */ public class MainActivity extends AppCompatActivity {

  // Variables for the search input field and results TextViews.
  private EditText mBookInput;
  private TextView mTitleText;    private
TextView mAuthorText;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);      setContentView(R.layout.activity_main);
     mBookInput = findViewById(R.id.bookInput);
mTitleText = findViewById(R.id.titleText);
mAuthorText = findViewById(R.id.authorText);
  }

  /**
* onClick handler for the "Search Books" button.
   *
* @param view The view (Button) that was clicked.
   */
  public void searchBooks(View view) {
    // Get the search string from the input field.
    String queryString = mBookInput.getText().toString();

    // Hide the keyboard when the button is pushed.
InputMethodManager inputManager = (InputMethodManager)
getSystemService(Context.INPUT_METHOD_SERVICE);      if
(inputManager != null) {
      inputManager.hideSoftInputFromWindow(view.getWindowToken(),
          InputMethodManager.HIDE_NOT_ALWAYS);
    }

    // Check the status of the network connection.      ConnectivityManager
connMgr = (ConnectivityManager)
getSystemService(Context.CONNECTIVITY_SERVICE);
    NetworkInfo networkInfo = null;      if
(connMgr != null) {
      networkInfo = connMgr.getActiveNetworkInfo();
    }
    // If the network is available, connected, and the search field
    // is not empty, start a FetchBook AsyncTask.
    if (networkInfo != null && networkInfo.isConnected()
        && queryString.length() != 0) {
      new FetchBook(mTitleText, mAuthorText).execute(queryString);
mAuthorText.setText("");
      mTitleText.setText(R.string.loading);
    }
    // Otherwise update the TextView to tell the user there is no
    // connection, or no search term.        else {
      if (queryString.length() == 0) {            mAuthorText.setText("");
        mTitleText.setText(R.string.no_search_term);           } else
{
        mAuthorText.setText("");
        mTitleText.setText(R.string.no_network);
      }
    }
  }
}
```

strings.xml

```
<resources>
  <string name="app_name">WhoWroteIt</string>

  <!-- Strings in activity_main view -->
  <string name="instructions">Enter a book name, or  part of the book name, or just text from a
book to find the full book title and who wrote the book! </string>
  <string name="button_text">Search Books</string>
  <string name="input_hint">Book Title</string>

  <!-- User messages for in-process queries and error results. -->
  <string name="loading">Loading…</string>
  <string name="no_results">"No Results Found"</string>
  <string name="no_search_term">Please enter a search term</string>     <string
name="no_network">Please check your network connection and try again.</string>
</resources>
```

Output:



Who Wrote It?

Enter a book name, or part of a book name, or just some text from a book to find the full book title and who wrote the book!

Enter a Book Title

SEARCH BOOKS

Romeo and Juliet
["William Shakespeare"]

Practical: 10

Practical: Use Firebase to perform CRUID operation

User.java package

```
info.androidhive.firebase;

import com.google.firebase.database.IgnoreExtraProperties;

/**
* Created by Ravi Tamada on 07/10/16.
* www.androidhive.info
 */

@IgnoreExtraProperties
public class User {

   public String name;
public String email;

   // Default constructor required for calls
to     // DataSnapshot.getValue(User.class)
   public User() {
   }

   public User(String name, String email) {
this.name = name;
      this.email = email;
   }
}
```

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:id="@+id/activity_main"
android:layout_width="match_parent"
android:layout_height="match_parent"
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"
    tools:context="info.androidhive.firebase.MainActivity">

    <TextView
        android:id="@+id/txt_user"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:paddingBottom="@dimen/activity_horizontal_margin"
android:paddingTop="@dimen/activity_horizontal_margin"
        android:textSize="20dp" />

    <LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:orientation="vertical">

        <android.support.design.widget.TextInputLayout
android:layout_width="match_parent"
            android:layout_height="wrap_content">

            <EditText
android:id="@+id/name"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="@string/name"
android:inputType="textCapWords"
android:maxLines="1" />

        </android.support.design.widget.TextInputLayout>

        <android.support.design.widget.TextInputLayout
android:layout_width="match_parent"
            android:layout_height="wrap_content">

            <EditText
android:id="@+id/email"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="@string/email"
android:inputType="textEmailAddress"
android:maxLines="1" />

        </android.support.design.widget.TextInputLayout>
        <Button
android:id="@+id/btn_save"
style="?android:textAppearanceSmall"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="16dp"
android:background="@color/colorPrimary"
android:text="@string/action_save"
android:textColor="@android:color/white"
android:textStyle="bold" />

    </LinearLayout>

</LinearLayout>
```

MainActivity.java package

```
info.androidhive.firebase;

import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import
android.text.TextUtils;
import android.util.Log;
import android.view.View;
import
android.widget.Button;
import
android.widget.EditText;
import android.widget.TextView;

import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import
com.google.firebase.database.DatabaseReference;
import
com.google.firebase.database.FirebaseDatabase;
import
com.google.firebase.database.ValueEventListener;

public class MainActivity extends AppCompatActivity {
    private static final String TAG =
MainActivity.class.getSimpleName();     private TextView
txtDetails;     private EditText inputName, inputEmail;     private
Button btnSave;     private DatabaseReference mFirebaseDatabase;
    private FirebaseDatabase mFirebaseInstance;

    private String userId;

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

        // Displaying toolbar icon
        getSupportActionBar().setDisplayShowHomeEnabled(true);
getSupportActionBar().setIcon(R.mipmap.ic_launcher);

        txtDetails = (TextView) findViewById(R.id.txt_user);
inputName = (EditText) findViewById(R.id.name);
inputEmail = (EditText) findViewById(R.id.email);
btnSave = (Button) findViewById(R.id.btn_save);
mFirebaseInstance = FirebaseDatabase.getInstance();

        // get reference to 'users' node
        mFirebaseDatabase = mFirebaseInstance.getReference("users");

        // store app title to 'app_title' node
        mFirebaseInstance.getReference("app_title").setValue("Realtime Database");

        // app_title change listener
        mFirebaseInstance.getReference("app_title").addValueEventListener(new
ValueEventListener() {
            @Override
            public void onDataChange(DataSnapshot dataSnapshot) {
Log.e(TAG, "App title updated");

                String appTitle = dataSnapshot.getValue(String.class);

                // update toolbar title
                getSupportActionBar().setTitle(appTitle);
            }

            @Override
            public void onCancelled(DatabaseError error) {
```

```
        // Failed to read value
        Log.e(TAG, "Failed to read app title value.", error.toException());
      }
    });

    // Save / update the user
    btnSave.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {
        String name = inputName.getText().toString();
        String email = inputEmail.getText().toString();

        // Check for already existed
userId          if
(TextUtils.isEmpty(userId)) {
createUser(name, email);
        } else {
          updateUser(name, email);
        }
      }
    });

    toggleButton();
  }

  // Changing button text
private void toggleButton() {
if (TextUtils.isEmpty(userId))
{
btnSave.setText("Save");
    } else {
      btnSave.setText("Update");
    }
  }

  /**
   * Creating new user node under 'users'
   */
  private void createUser(String name, String email) {
    // TODO
    // In real apps this userId should be
fetched     // by implementing firebase
auth     if (TextUtils.isEmpty(userId)) {
      userId = mFirebaseDatabase.push().getKey();
```

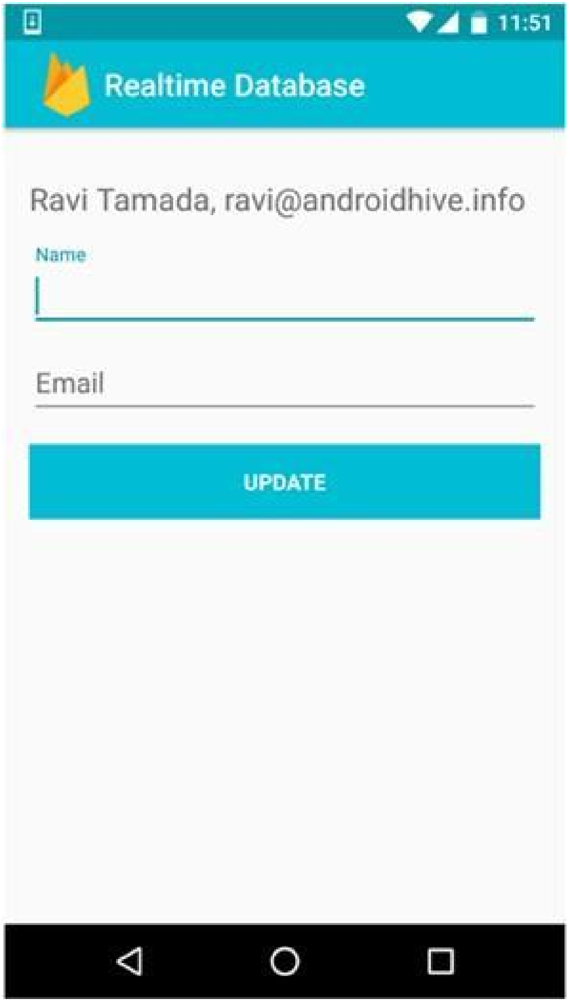
```
        }

        User user = new User(name, email);

        mFirebaseDatabase.child(userId).setValue(user);

        addUserChangeListener();
    }

    /**
     * User data change listener
     */
    private void addUserChangeListener() {
        // User data change listener
        mFirebaseDatabase.child(userId).addValueEventListener(new
ValueEventListener() {
            @Override
            public void onDataChange(DataSnapshot dataSnapshot) {
                User user = dataSnapshot.getValue(User.class);

                // Check for
null                    if (user ==
null) {
                    Log.e(TAG, "User data is null!");
return;
                }

                Log.e(TAG, "User data is changed!" + user.name + ", " + user.email);

                // Display newly updated name and email
txtDetails.setText(user.name + ", " + user.email);

                // clear edit text
inputEmail.setText("");
inputName.setText("");
toggleButton();
            }

            @Override
            public void onCancelled(DatabaseError error) {
                // Failed to read value
                Log.e(TAG, "Failed to read user", error.toException());
            }
        });
```

```
   }

   private void updateUser(String name, String email) {
       // updating the user via child
nodes         if
(!TextUtils.isEmpty(name))
           mFirebaseDatabase.child(userId).child("name").setValue(name);

       if (!TextUtils.isEmpty(email))
           mFirebaseDatabase.child(userId).child("email").setValue(email);
   }
}
```

JSON Structure:

```
{
  "app_title" : "Realtime Database",
  "users" : {
    "-KTYWvZG4Qn9ZYTc47O6" : {
      "email" : "ravi@androidhive.info",
      "name" : "Ravi Tamada"
    }
  } }
```

Output:



Ravi Tamada, ravi@androidhive.info

Practical: 11

Practical: BroadcastReceiver

activity_main.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"
tools:context=".MainActivity">

   <Button
       android:id = "@+id/sendBroadcast"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="@string/send_custom_broadcast"
android:onClick="sendCustomBroadcast"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent" />

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

MainActivity.java

```
package
com.android.fundamentals.powerreceiver;
 import android.content.Intent; import
android.content.IntentFilter;
import android.support.v4.content.LocalBroadcastManager;
import android.support.v7.app.AppCompatActivity; import
android.os.Bundle; import android.view.View;

/**
* The Power Receiver app responds to system broadcasts about the power
* connected state as well as a custom broadcast that is sent when the user  * taps the
   button.
 */
public class MainActivity extends AppCompatActivity {
    private CustomReceiver mReceiver = new CustomReceiver();

   // String constant that defines the custom broadcast Action.     private static
final String ACTION_CUSTOM_BROADCAST =
          BuildConfig.APPLICATION_ID + ".ACTION_CUSTOM_BROADCAST";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);

        // Define the IntentFilter.
        IntentFilter filter = new IntentFilter();
        // Add system broadcast actions sent by the system when the power is
        // connected and disconnected.
filter.addAction(Intent.ACTION_POWER_CONNECTED);
filter.addAction(Intent.ACTION_POWER_DISCONNECTED);

        // Register the receiver using the activity context, passing in the
        // IntentFilter.         this.registerReceiver(mReceiver, filter);

        // Register the receiver to receive custom broadcast.
        LocalBroadcastManager.getInstance(this).registerReceiver
                (mReceiver, new IntentFilter(ACTION_CUSTOM_BROADCAST));
    }

    /**
*  Click event handler for the button, that sends custom broadcast using the
*  LocalBroadcastManager.
     */
    public void sendCustomBroadcast(View view) {
        Intent customBroadcastIntent = new Intent(ACTION_CUSTOM_BROADCAST);
        LocalBroadcastManager.getInstance(this)
                .sendBroadcast(customBroadcastIntent);
    }

    /**
*  Unregisters the broadcast receivers when the app is destroyed.
     */     @Override
    protected void onDestroy() {          //
Unregister the receivers.
        this.unregisterReceiver(mReceiver);
        LocalBroadcastManager.getInstance(this).unregisterReceiver(mReceiver);
super.onDestroy();
    } }
```

CustomReceiver.java

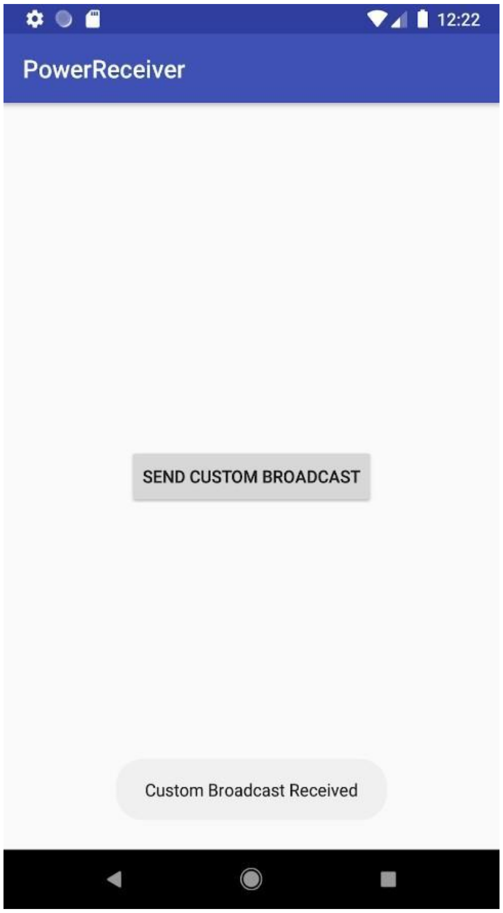
```
/*
*                              Copyright (C) 2018 Google Inc.
 *
```

```
*                   Licensed under the Apache License, Version 2.0 (the "License");  *
                    you may not use this file except in compliance with the License.
*                   You may obtain a copy of the License at
 *
*                   http://www.apache.org/licenses/LICENSE-2.0
 *
*                   Unless required by applicable law or agreed to in writing, software
*                   distributed under the License is distributed on an "AS IS" BASIS,
*                   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either
                    express or implied.  * See the License for the specific language
                    governing permissions and  * limitations under the License.
 */
package com.android.fundamentals.powerreceiver;
 import android.arch.core.BuildConfig; import
android.content.BroadcastReceiver; import
android.content.Context; import
android.content.Intent; import
android.widget.Toast;

/**
*                   Broadcast Receiver implementation that delivers a custom Toast  *
                    message when it receives any of the registered broadcasts.
 */
public class CustomReceiver extends BroadcastReceiver {

   // String constant that defines the custom broadcast Action.    private static
final String ACTION_CUSTOM_BROADCAST =
         BuildConfig.APPLICATION_ID +
".ACTION_CUSTOM_BROADCAST";

   /**
*                   This callback method gets called when the Broadcast Receiver
                    receives a
*                   broadcast that it is registered for.
    *
*                   @param context The context in which broadcast receiver is running.
*                   @param intent The broadcast is delivered in the form of an intent
                    which
*                   contains the broadcast action.
    */    @Override
   public void onReceive(Context context, Intent intent) {
      String intentAction = intent.getAction();

      if (intentAction != null) {
          String toastMessage = context.getString(R.string.unknown_action);
          switch (intentAction){                case
Intent.ACTION_POWER_CONNECTED:
                toastMessage = context.getString(R.string.power_connected);
break;                case Intent.ACTION_POWER_DISCONNECTED:
                toastMessage =
                      context.getString(R.string.power_disconnected);                 break;
case ACTION_CUSTOM_BROADCAST:                     toastMessage =
                      context.getString(R.string.custom_broadcast_toast);                 break;
          }

          Toast.makeText(context, toastMessage, Toast.LENGTH_SHORT).show();
       }
   } }
```

strings.xml

```
<resources>
   <string name="app_name">PowerReceiver</string>
   <string name="power_connected">Power connected!</string>
   <string name="power_disconnected">Power disconnected!</string>
   <string name="custom_broadcast_toast">Custom Broadcast Received</string>
   <string name="send_custom_broadcast">Send Custom Broadcast</string>
   <string name="receiver_on">Receiver On</string>
   <string name="receiver_off">Receiver Off</string>
   <string name="unknown_action">unknown intent action</string>
</resources>
```

Output:



Custom Broadcast Received

Practical: 12

Practical: Notifications

activity_main.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"
tools:context=".MainActivity">
   <Button
     android:id="@+id/notify"       android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="@string/notify_me"
app:layout_constraintBottom_toTopOf="@+id/update"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />
   <Button
     android:id="@+id/update"       android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="@string/update_me"
app:layout_constraintBottom_toTopOf="@+id/cancel"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/notify" />
   <Button
     android:id="@+id/cancel"       android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="@string/cancel_me"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/update" />


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

MainActivity.java package

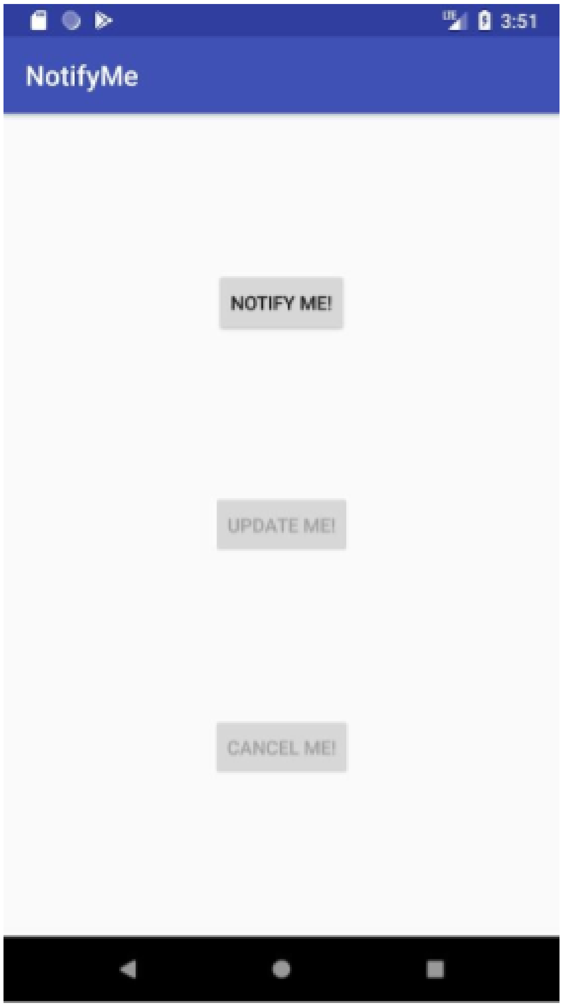
```
com.android.example.notifyme; import
android.app.NotificationChannel; import
android.app.NotificationManager; import
android.app.PendingIntent; import
android.content.BroadcastReceiver;
import android.content.Context; import
android.content.Intent; import
android.content.IntentFilter; import
android.graphics.Bitmap; import
android.graphics.BitmapFactory; import
android.graphics.Color; import
android.os.Bundle;
import android.support.v4.app.NotificationCompat;
import android.support.v7.app.AppCompatActivity;
import android.view.View; import
android.widget.Button;

/**
 * MainActivity for the Notify Me! app. Contains three buttons that deliver,  * update,
and cancel notification.
 */
public class MainActivity extends AppCompatActivity {

   // Constants for the notification actions buttons.
   private static final String ACTION_UPDATE_NOTIFICATION =
          "com.android.example.notifyme.ACTION_UPDATE_NOTIFICATION";
   // Notification channel ID.     private static final String
PRIMARY_CHANNEL_ID =
"primary_notification_channel";
   // Notification ID.     private static final int
NOTIFICATION_ID = 0;
    private Button button_notify;
private Button button_cancel;
private Button button_update;

   private NotificationManager mNotifyManager;
    private NotificationReceiver mReceiver = new NotificationReceiver();

   /**
*  Initializes the activity.
    *
*  @param savedInstanceState The current state data.
    */    @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_main);

       // Create the notification channel.
       createNotificationChannel();
    // Register the broadcast receiver to receive the update action from      // the
notification.
    registerReceiver(mReceiver,
        new IntentFilter(ACTION_UPDATE_NOTIFICATION));

    // Add onClick handlers to all the buttons.      button_notify =
findViewById(R.id.notify);
    button_notify.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {          //
Send the notification          sendNotification();
      }
    });
    button_update = (Button) findViewById(R.id.update);
button_update.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {
        // Update the notification.
        updateNotification();
      }
    });
    button_cancel = (Button) findViewById(R.id.cancel);
button_cancel.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {
        // Cancel the notification.
        cancelNotification();
      }
    });

    // Reset the button states. Enable only Notify button and disable
    // update and cancel buttons.      setNotificationButtonState(true, false,
false);
  }

  /**
* Unregisters the receiver when the app is being destroyed.
   */   @Override
  protected void onDestroy() {
unregisterReceiver(mReceiver);      super.onDestroy();
  }

  /**
```

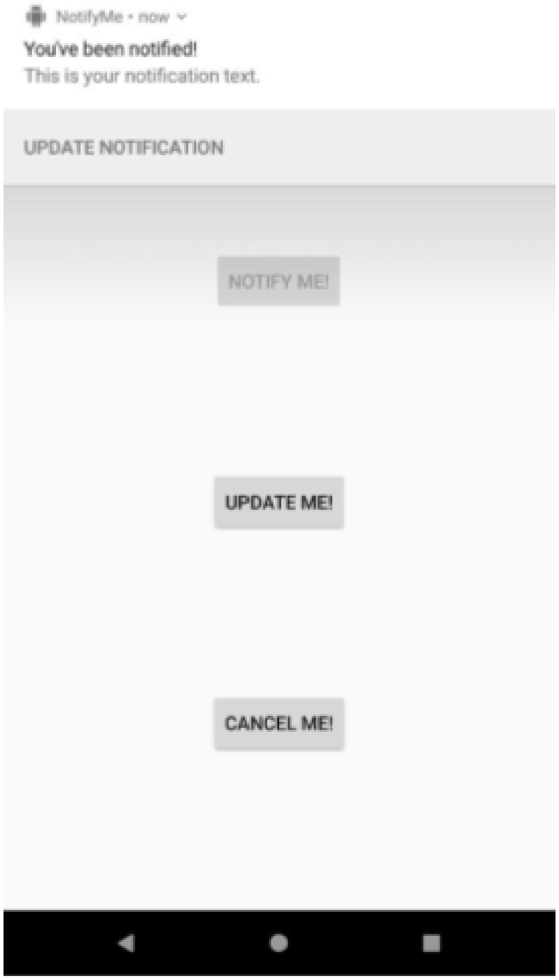
```
* Creates a Notification channel, for OREO and higher.
   */
  public void createNotificationChannel() {

     // Create a notification manager object.       mNotifyManager =
          (NotificationManager) getSystemService(NOTIFICATION_SERVICE);
     // Notification channels are only available in OREO and higher.
     // So, add a check on SDK version.
     if (android.os.Build.VERSION.SDK_INT >=
                         android.os.Build.VERSION_CODES.O) {

        // Create the NotificationChannel with all the parameters.
        NotificationChannel notificationChannel = new NotificationChannel
             (PRIMARY_CHANNEL_ID,
                  getString(R.string.notification_channel_name),
                  NotificationManager.IMPORTANCE_HIGH);
         notificationChannel.enableLights(true);
notificationChannel.setLightColor(Color.RED);
notificationChannel.enableVibration(true);
notificationChannel.setDescription
             (getString(R.string.notification_channel_description));

        mNotifyManager.createNotificationChannel(notificationChannel);
     }
  }

  /**
* OnClick method for the "Notify Me!" button.
* Creates and delivers a simple notification.
   */
  public void sendNotification() {

     // Sets up the pending intent to update the notification.
     // Corresponds to a press of the Update Me! button.
     Intent updateIntent = new Intent(ACTION_UPDATE_NOTIFICATION);
     PendingIntent updatePendingIntent = PendingIntent.getBroadcast(this,
NOTIFICATION_ID, updateIntent, PendingIntent.FLAG_ONE_SHOT);
     // Build the notification with all of the parameters using helper
     // method.       NotificationCompat.Builder notifyBuilder =
getNotificationBuilder();

     // Add the action button using the pending intent.
     notifyBuilder.addAction(R.drawable.ic_update,
                  getString(R.string.update), updatePendingIntent);
        // Deliver the notification.         mNotifyManager.notify(NOTIFICATION_ID,
notifyBuilder.build());

        // Enable the update and cancel buttons but disables the "Notify
        // Me!" button.         setNotificationButtonState(false, true,
true);
    }

    /**
* Helper method that builds the notification.
     *
* @return NotificationCompat.Builder: notification build with all the
* parameters.
     */
    private NotificationCompat.Builder getNotificationBuilder() {

        // Set up the pending intent that is delivered when the notification
        // is clicked.
        Intent notificationIntent = new Intent(this, MainActivity.class);
        PendingIntent notificationPendingIntent = PendingIntent.getActivity
                (this, NOTIFICATION_ID, notificationIntent,
                        PendingIntent.FLAG_UPDATE_CURRENT);

        // Build the notification with all of the parameters.
        NotificationCompat.Builder notifyBuilder = new NotificationCompat
                .Builder(this, PRIMARY_CHANNEL_ID)
                .setContentTitle(getString(R.string.notification_title))
                .setContentText(getString(R.string.notification_text))
                .setSmallIcon(R.drawable.ic_android)
                .setAutoCancel(true).setContentIntent(notificationPendingIntent)
                .setPriority(NotificationCompat.PRIORITY_HIGH)
.setDefaults(NotificationCompat.DEFAULT_ALL);         return notifyBuilder;
    }

    /**
* OnClick method for the "Update Me!" button. Updates the existing
* notification to show a picture.
     */
    public void updateNotification() {

        // Load the drawable resource into the a bitmap image.
        Bitmap androidImage = BitmapFactory
                .decodeResource(getResources(), R.drawable.mascot_1);
        // Build the notification with all of the parameters using helper
        // method.
        NotificationCompat.Builder notifyBuilder = getNotificationBuilder();
        // Update the notification style to BigPictureStyle.
        notifyBuilder.setStyle(new NotificationCompat.BigPictureStyle()
                .bigPicture(androidImage)
                .setBigContentTitle(getString(R.string.notification_updated)));
        // Deliver the notification.         mNotifyManager.notify(NOTIFICATION_ID,
notifyBuilder.build());

        // Disable the update button, leaving only the cancel button enabled.
setNotificationButtonState(false, false, true);
    }

    /**
* OnClick method for the "Cancel Me!" button. Cancels the notification.
     */
    public void cancelNotification() {
        // Cancel the notification.         mNotifyManager.cancel(NOTIFICATION_ID);

        // Reset the buttons.         setNotificationButtonState(true, false,
false);
    }

    /**
* Helper method to enable/disable the buttons.
     *
* @param isNotifyEnabled, boolean: true if notify button enabled
* @param isUpdateEnabled, boolean: true if update button enabled
* @param isCancelEnabled, boolean: true if cancel button enabled
     */
    void setNotificationButtonState(Boolean isNotifyEnabled, Boolean
isUpdateEnabled, Boolean isCancelEnabled) {
button_notify.setEnabled(isNotifyEnabled);         button_update.setEnabled(isUpdateEnabled);
button_cancel.setEnabled(isCancelEnabled);
    }

    /**
* The broadcast receiver class for notifications.
* Responds to the update notification pending intent action.
     */
    public class NotificationReceiver extends BroadcastReceiver {

        public NotificationReceiver() {
        }
        /**
* Receives the incoming broadcasts and responds accordingly.
         *
* @param context Context of the app when the broadcast is received.
* @param intent The broadcast intent containing the action.
         */
@Override
        public void onReceive(Context context, Intent intent) {
            // Update the notification.
            updateNotification();
        }
    } }
```

strings.xml

```
<resources>
    <string name="app_name">Notify Me!</string>
    <string name="notification_title">You\'ve been notified!</string>
    <string name="notification_text">This is your notification text.</string>
    <string name="update">Update Notification</string>
    <string name="notify_me">Notify Me!</string>
    <string name="update_me">Update Me!</string>
    <string name="cancel_me">Cancel Me!</string>
    <string name="notification_updated">Notification Updated!</string>
    <string name="notification_channel_name">Mascot Notification</string>
    <string name="notification_channel_description">Notification from Mascot</string>
</resources>
```

Output:





You've been notified!

This is your notification text.

Practical: 13

Practical: Get and Save User Preferences

activity_main.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:padding="16dp"
tools:context=".MainActivity">

  <TextView
      android:id="@+id/count_textview"
android:layout_width="0dp"        android:layout_height="0dp"
      android:background="@color/default_background"
android:gravity="center"        android:text="@string/default_count"
android:textColor="@android:color/white"        android:textSize="112sp"
      app:layout_constraintBottom_toTopOf="@+id/guideline_upper"
app:layout_constraintDimensionRatio="1:1"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"/>

  <android.support.constraint.Guideline
android:id="@+id/guideline_upper"        android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:orientation="horizontal"
app:layout_constraintGuide_end="120dp"/>
   <Button
      android:id="@+id/black_background_button"
style="@style/AppTheme.Button.Colored"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:background="@android:color/black"
android:onClick="changeBackground"
android:text="@string/black_button"
      app:layout_constraintBottom_toTopOf="@+id/guideline_lower"
app:layout_constraintEnd_toStartOf="@+id/red_background_button"
app:layout_constraintHorizontal_chainStyle="packed"
app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="@+id/guideline_upper"/>

  <Button
```

```
      android:id="@+id/red_background_button"
style="@style/AppTheme.Button.Colored"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:background="@color/red_background"
android:onClick="changeBackground"        android:text="@string/red_button"
      app:layout_constraintBottom_toTopOf="@+id/guideline_lower"
app:layout_constraintEnd_toStartOf="@+id/blue_background_button"
app:layout_constraintStart_toEndOf="@+id/black_background_button"
app:layout_constraintTop_toTopOf="@+id/guideline_upper"/>
   <Button
      android:id="@+id/blue_background_button"
style="@style/AppTheme.Button.Colored"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:background="@color/blue_background"
android:onClick="changeBackground"        android:text="@string/blue_button"
      app:layout_constraintBottom_toTopOf="@+id/guideline_lower"
app:layout_constraintEnd_toStartOf="@+id/green_background_button"
app:layout_constraintStart_toEndOf="@+id/red_background_button"
app:layout_constraintTop_toTopOf="@+id/guideline_upper"/>
   <Button
      android:id="@+id/green_background_button"
style="@style/AppTheme.Button.Colored"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:background="@color/green_background"
android:onClick="changeBackground"
android:text="@string/green_button"
      app:layout_constraintBottom_toTopOf="@+id/guideline_lower"
app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toEndOf="@+id/blue_background_button"
app:layout_constraintTop_toTopOf="@+id/guideline_upper"/>

  <android.support.constraint.Guideline
android:id="@+id/guideline_lower"        android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:orientation="horizontal"
app:layout_constraintGuide_end="56dp"/>
   <Button
      android:id="@+id/count_button"
style="@style/AppTheme.Button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginEnd="16dp"
android:layout_marginRight="16dp"        android:onClick="countUp"
```

```
android:text="@string/count_button"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/reset_button"
app:layout_constraintHorizontal_chainStyle="packed"
app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toBottomOf="@+id/guideline_lower"/>

   <Button
      android:id="@+id/reset_button"        style="@style/AppTheme.Button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:onClick="reset"
android:text="@string/reset_button"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toEndOf="@+id/count_button"
app:layout_constraintTop_toBottomOf="@+id/guideline_lower"/>

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

MainActivity.java

```
/*
*         Copyright (C) 2016 Google Inc.
 *
*         Licensed under the Apache License, Version 2.0 (the "License");  * you may not
          use this file except in compliance with the License.
*         You may obtain a copy of the License at
 *
*         http://www.apache.org/licenses/LICENSE-2.0
 *
*         Unless required by applicable law or agreed to in writing, software
*         distributed under the License is distributed on an "AS IS" BASIS,  * WITHOUT
          WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  *
          See the License for the specific language governing permissions and  *
          limitations under the License.
 */
package com.example.android.hellosharedprefs;
 import android.content.SharedPreferences; import
android.graphics.drawable.ColorDrawable; import
android.support.v4.content.ContextCompat; import
android.support.v7.app.AppCompatActivity; import
android.os.Bundle; import android.view.View; import
android.widget.TextView;

/**
```

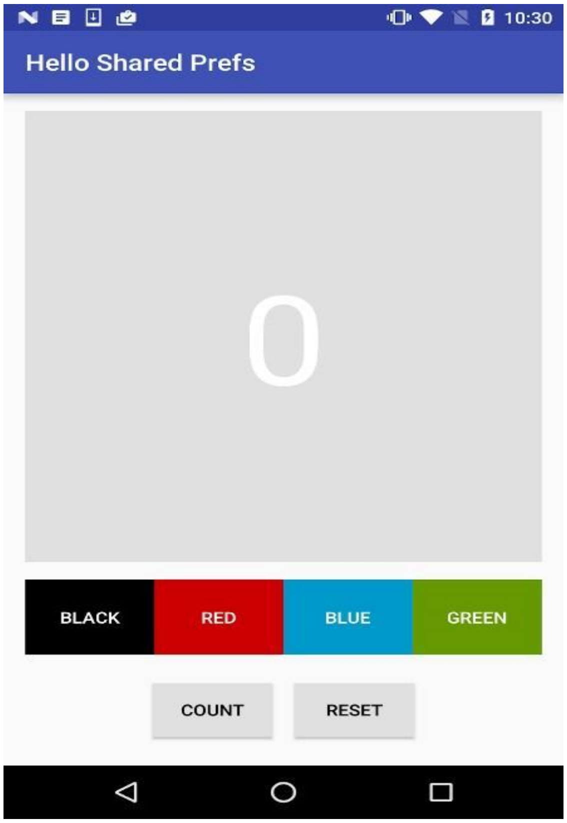
```
*         HelloSharedPrefs is an adaptation of the HelloToast app from chapter 1.
*         It includes:
*         - Buttons for changing the background color.
*         - Maintenance of instance state.   * - Themes and styles.
*         - Read and write shared preferences for the current count and the color.
 *  <p>
 * This is the solution code for HelloSharedPrefs.
 */
public class MainActivity extends AppCompatActivity {
   // Current count     private int
mCount = 0;     // Current
background color     private int
mColor;
   // Text view to display both count and color     private
TextView mShowCountTextView;

   // Key for current count
   private final String COUNT_KEY = "count";
   // Key for current color
   private final String COLOR_KEY = "color";

   // Shared preferences object
   private SharedPreferences mPreferences;

   // Name of shared preferences file     private
String sharedPrefFile =
         "com.example.android.hellosharedprefs";


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

       // Initialize views, color, preferences
       mShowCountTextView = findViewById(R.id.count_textview);
       mColor = ContextCompat.getColor(this,
             R.color.default_background);
       mPreferences = getSharedPreferences(sharedPrefFile, MODE_PRIVATE);

       // Restore preferences
       mCount = mPreferences.getInt(COUNT_KEY, 0);
mShowCountTextView.setText(String.format("%s", mCount));        mColor =
mPreferences.getInt(COLOR_KEY, mColor);
mShowCountTextView.setBackgroundColor(mColor);
```

```
    }

    /**
*   Handles the onClick for the background color buttons.  Gets background
*   color of the button that was clicked, and sets the TextView background
*   to that color.
     *
*   @param view The view (Button) that was clicked.
     */
    public void changeBackground(View view) {
        int color = ((ColorDrawable) view.getBackground()).getColor();
mShowCountTextView.setBackgroundColor(color);          mColor = color;
    }

    /**
*   Handles the onClick for the Count button.  Increments the value of the
*   mCount global and updates the TextView.
     *
*   @param view The view (Button) that was clicked.
     */
    public void countUp(View view) {
mCount++;
        mShowCountTextView.setText(String.format("%s", mCount));
    }

    /**
*   Handles the onClick for the Reset button.  Resets the global count and       *
    background variables to the defaults and resets the views to those
*   default values.
     *
*   @param view The view (Button) that was clicked.
     */
    public void reset(View view) {
        // Reset count         mCount
= 0;
        mShowCountTextView.setText(String.format("%s", mCount));

        // Reset color
        mColor = ContextCompat.getColor(this,
R.color.default_background);
mShowCountTextView.setBackgroundColor(mColor);

        // Clear preferences
        SharedPreferences.Editor preferencesEditor = mPreferences.edit();
preferencesEditor.clear();         preferencesEditor.apply();
    }

    /**
     * Callback for activity pause.  Shared preferences are saved here.
     */     @Override
    protected void onPause() {         super.onPause();

        SharedPreferences.Editor preferencesEditor = mPreferences.edit();
preferencesEditor.putInt(COUNT_KEY, mCount);
preferencesEditor.putInt(COLOR_KEY, mColor);         preferencesEditor.apply();
    } }
```

strings.xml

```
<resources>
    <!-- Title of app -->
    <string name="app_name">HelloSharedPrefs</string>

    <!-- Button label for blue button -->
    <string name="blue_button">Blue</string>

    <!-- Button label for green button -->
    <string name="green_button">Green</string>

    <!-- Button label for red button -->
    <string name="red_button">Red</string>

    <!-- Button label for black button -->
    <string name="black_button">Black</string>

    <!-- Default string for count textview -->
    <string name="default_count">0</string>

    <!-- Button label for Count button -->
    <string name="count_button">Count</string>

    <!-- Button label for Reset button -->
    <string name="reset_button">Reset</string>
</resources>
```

Output:



Practical: 14

Practical: Using location service get the current location and display in TextView

AndroidManifest.xml

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

   <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
   <uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
   <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
   <uses-permission android:name="android.permission.INTERNET" />
   <uses-permission
android:name="com.google.android.providers.gsf.permission.READ_GSERVICES"       />
<uses-permission   android:name="android.permission.WRITE_EXTERNAL_STORAGE"
/>
   <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/Theme.CurrentLocationDemo">
      <activity android:name=".MainActivity">
         <intent-filter>
            <action android:name="android.intent.action.MAIN" />

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

   <meta-data
      android:name="com.google.android.geo.API_KEY"
      android:value="AIzaSyBZ2tydt2CWrBTVfisn8GO50MnTX615gE0" />

</manifest>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
```

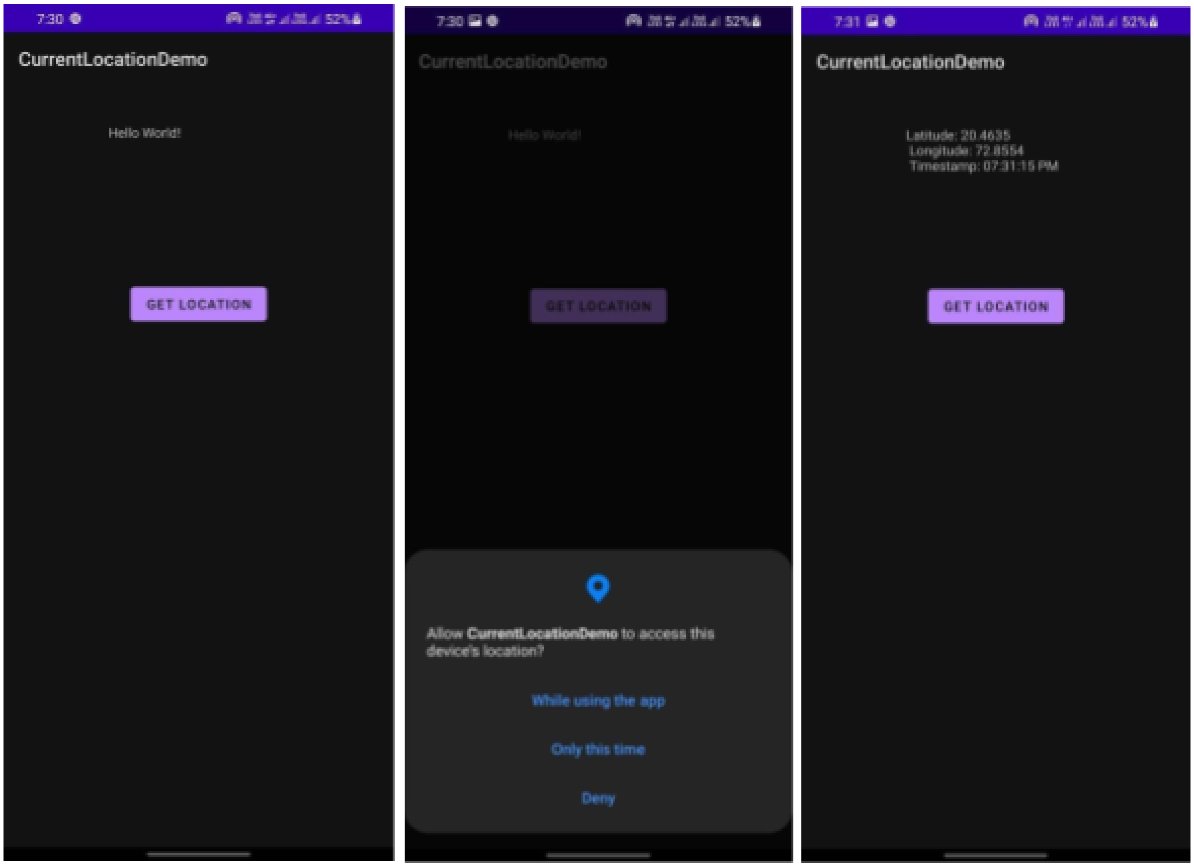
```
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"    android:layout_height="match_parent"
tools:context=".MainActivity">

  <TextView
      android:id="@+id/textView"
android:layout_width="188dp"
android:layout_height="101dp"      android:text="Hello
World!"
      app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.497"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.058" />
   <Button
      android:id="@+id/button"
android:layout_width="wrap_content"
android:layout_height="wrap_content"      android:text="Get
Location"
      app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.275" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.currentlocationdemo;

import androidx.annotation.NonNull; import
androidx.appcompat.app.AppCompatActivity; import
androidx.core.app.ActivityCompat;

import android.Manifest; import
android.content.pm.PackageManager; import
android.location.Address; import
android.location.Geocoder; import
android.location.Location; import
android.os.Bundle; import android.util.Log;
```

```
import android.view.View; import
android.widget.Button; import
android.widget.TextView; import
android.widget.Toast;

import com.google.android.gms.location.FusedLocationProviderClient;
import com.google.android.gms.location.LocationServices; import
com.google.android.gms.maps.model.LatLng; import
com.google.android.gms.tasks.OnSuccessListener;
import java.io.IOException;
import java.util.List; import
java.util.Locale;

public class MainActivity extends AppCompatActivity {

   Location mLastLocation;
   TextView t;
   Button b;
   FusedLocationProviderClient mFusedLocationClient;
   Geocoder geocoder;
   LatLng sydney = new LatLng(-34, 151);
   LatLng currentLoc;
   List<Address> addresses;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);        setContentView(R.layout.activity_main);
       b = findViewById(R.id.button);        t =
findViewById(R.id.textView);
      b.setOnClickListener(new View.OnClickListener() {
@Override
         public void onClick(View v) {              getLocation();
         }
      });

      mFusedLocationClient = LocationServices.getFusedLocationProviderClient(this);     }
   private void getLocation() {
      if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION)
             != PackageManager.PERMISSION_GRANTED) {
         ActivityCompat.requestPermissions(this, new String[]
                {Manifest.permission.ACCESS_FINE_LOCATION}, 1);
      } else {
            mFusedLocationClient.getLastLocation().addOnSuccessListener(
new OnSuccessListener<Location>() {
                        @Override
                        public void onSuccess(Location location) {
if (location != null) {                         mLastLocation = location;
                                t.setText(
                                                                          getString(R.string.location_text,
mLastLocation.getLatitude(),                                               mLastLocation.getLongitude(),
mLastLocation.getTime()));                                                           currentLoc  =  new
LatLng(mLastLocation.getLatitude(), mLastLocation.getLongitude());                              } else {
                                t.setText("No Location");
                            }
                        }
                    });

            /*geocoder = new Geocoder(this, Locale.getDefault());             try {
                addresses = geocoder.getFromLocation(sydney.latitude, sydney.longitude, 1);
                //List<Address> addresses = geocoder.getFromLocationName("731 Market
St, San Francisco, CA 94103", 1);
                Address firstAddress = addresses.get(0);                 double
latitude = firstAddress.getLatitude();                 double longitude =
firstAddress.getLongitude();
                t.setText(firstAddress.getAddressLine(0) + "\n" + "Latitude:" + latitude +"\n" +
"Longitude:" + longitude);             } catch (IOException e) {
                e.printStackTrace();
            }*/

            /*if(addresses!=null){
                Address a = addresses.get(0);                 StringBuilder s
= new StringBuilder();
                s.append(a.getAddressLine(0));
                t.setText(s.toString());
            }*/
        }
    }

    @Override
    public void onRequestPermissionsResult(int requestCode,
                                           @NonNull String[] permissions, @NonNull int[] grantResults) {
switch (requestCode) {             case 1:
                // If the permission is granted, get the location,
                // otherwise, show a Toast
                if (grantResults.length > 0 && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
getLocation();
              } else {
                  Toast.makeText(this, "Location Permission Denied!",
Toast.LENGTH_SHORT).sho
w();                }
break;
        }
    } }
```

Output:



Hello World!

Hello World!

Allow **CurrentLocationDemo** to access this device's location?

Latitude: 20.4635
Longitude: 72.8554
Timestamp: 07:31:15 PM

Practical: 15

Practical: Display the use of animations

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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">

   <com.example.practical4.MyCircle        android:layout_width="match_parent"
android:layout_height="match_parent"/>

</RelativeLayout>
```

MainActivity.java

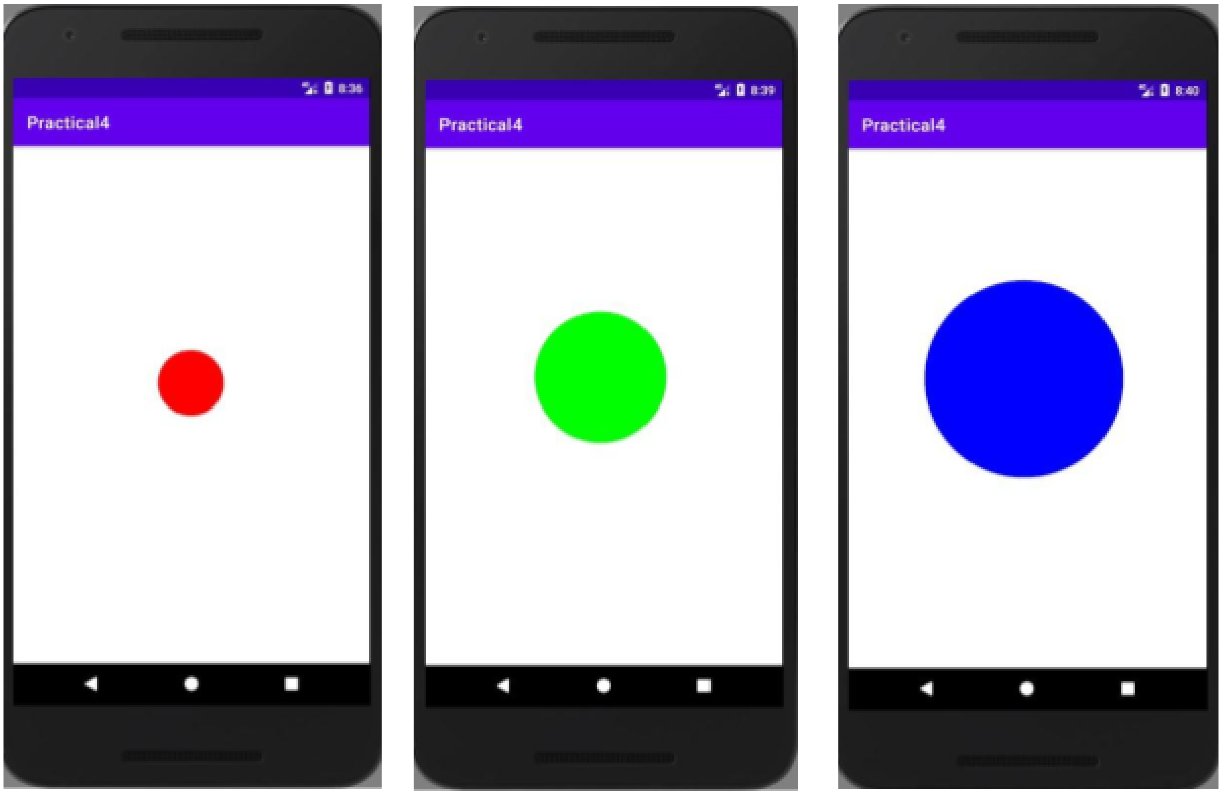
```
package com.example.practical4;

import androidx.appcompat.app.AppCompatActivity;
 import android.animation.AnimatorInflater;
import android.animation.AnimatorSet; import
android.graphics.Color; import
android.graphics.Paint;
import android.graphics.drawable.ShapeDrawable;
import android.graphics.drawable.shapes.Shape;
import android.os.Bundle; import android.view.View;
import android.view.ViewGroup; import
android.view.animation.Animation; import
android.view.animation.AnimationUtils;
 public class MainActivity extends AppCompatActivity {


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

MyCircle.java package

```
com.example.practical4;

import android.animation.AnimatorSet;
import android.animation.ArgbEvaluator;
import android.animation.ObjectAnimator;
import android.animation.ValueAnimator;
import android.content.Context; import
android.graphics.Canvas; import
android.graphics.Color; import
android.graphics.Paint;
import android.graphics.drawable.ColorDrawable;
import android.util.AttributeSet; import
android.view.MotionEvent; import
android.view.View;
import android.view.animation.LinearInterpolator;

import androidx.interpolator.view.animation.LinearOutSlowInInterpolator;

public class MyCircle extends View {
private float mRadius;     private Paint
mPaint = new Paint();     private float mX;
private float mY;
   private static final int ANIMATION_DURATION = 4000;     private
static final long ANIMATION_DELAY = 1000;     private AnimatorSet
mPulseAnimatorSet = new AnimatorSet();

   public MyCircle(Context context) {        super(context);
      mPaint.setColor(Color.RED);
   }
         public  MyCircle(Context  context,  AttributeSet  attrs)  {
super(context, attrs);        mPaint.setColor(Color.RED);
   }
   public void setRadius(float radius) {
mRadius = radius;        invalidate();
   }

   @Override
   public boolean onTouchEvent(MotionEvent event) {        if
(event.getActionMasked() == MotionEvent.ACTION_DOWN) {
mX = event.getX();            mY = event.getY();

         if(mPulseAnimatorSet != null && mPulseAnimatorSet.isRunning()) {
mPulseAnimatorSet.cancel();
         }
         mPulseAnimatorSet.start();
      }
      return super.onTouchEvent(event);
   }

   @Override
```

```
    protected void onDraw(Canvas canvas) {         super.onDraw(canvas);
        canvas.drawCircle(mX, mY, mRadius, mPaint);
    }


    @Override
    public void onSizeChanged(int w, int h, int oldw, int oldh) {

        ObjectAnimator growAnimator = ObjectAnimator.ofFloat(this,
                "radius", 0, 100);
        growAnimator.setDuration(ANIMATION_DURATION);

        ObjectAnimator rotateAnimator = ObjectAnimator.ofFloat(this,
MyCircle.ROTATION, 0f,360f);
        rotateAnimator.setDuration(ANIMATION_DURATION);

        ObjectAnimator colorAnimator = ObjectAnimator.ofInt(mPaint, "color",
Color.GREEN, Color.GREEN);
        colorAnimator.setDuration(ANIMATION_DURATION);
colorAnimator.setStartDelay(ANIMATION_DELAY);

        ObjectAnimator growAnimator1 = ObjectAnimator.ofFloat(this,
                "radius", 100, 200);
        growAnimator1.setDuration(ANIMATION_DURATION);

        ObjectAnimator rotateAnimator1 = ObjectAnimator.ofFloat(this,
MyCircle.ROTATION, 0f,360f);
        rotateAnimator1.setDuration(ANIMATION_DURATION);

        ObjectAnimator colorAnimator1 = ObjectAnimator.ofInt(mPaint, "color",
Color.BLUE, Color.BLUE);
        colorAnimator1.setDuration(ANIMATION_DURATION);
colorAnimator1.setStartDelay(ANIMATION_DELAY);

        ObjectAnimator growAnimator2 = ObjectAnimator.ofFloat(this,
                "radius", 200, 300);
        growAnimator2.setDuration(ANIMATION_DURATION);

        ObjectAnimator rotateAnimator2 = ObjectAnimator.ofFloat(this,
MyCircle.ROTATION, 0f,360f);
        rotateAnimator2.setDuration(ANIMATION_DURATION);
         mPulseAnimatorSet.play(growAnimator).before(rotateAnimator);
mPulseAnimatorSet.play(growAnimator1).after(rotateAnimator);
mPulseAnimatorSet.play(colorAnimator).with(growAnimator1);
mPulseAnimatorSet.play(rotateAnimator1).after(growAnimator1);
mPulseAnimatorSet.play(growAnimator2).after(rotateAnimator1);
mPulseAnimatorSet.play(growAnimator2).with(colorAnimator1);
mPulseAnimatorSet.play(rotateAnimator2).after(growAnimator2);           }

}
```

Output:


8:36
Practical4
8:39
Practical4
8:40
Practical4