# 1.Creating an Android Project 1. Create an Android project with a minimum SDK of 21. Design a simple app that displays "Hello, World!" on the screen.

#### Code:

```
<?xml version="1.0" encoding="utf-8"?>
                                                           package com.example.helloworldapp;
<RelativeLayout
xmlns:android="http://schemas.android.co
                                                           import android.os.Bundle;
m/apk/res/android"
                                                           import
                                                           androidx.appcompat.app.AppCompatActivit
xmlns:tools="http://schemas.android.com/t
                                                           у;
ools"
  android:layout width="match parent"
                                                           public class MainActivity extends
  android:layout height="match parent"
                                                           AppCompatActivity {
  tools:context=".MainActivity">
                                                             @Override
                                                             protected void onCreate(Bundle
  <TextView
                                                           savedInstanceState) {
     android:id="@+id/helloKamlesh"
                                                                super.onCreate(savedInstanceState);
     android:layout width="wrap content"
                                                                setContentView(R.layout.activity main);
                                                             }
     android:layout height="wrap content"
     android:text="Hello, World!"
                                                           }
                                                           activirty_main.xml
     android:textSize="24sp"
                                                                              C# Nexus 6 API 21: Android 5.0 (( AK. *
                                                               ?xml version_"1.0 erceding-Utf-3
     android:layout centerInParent="true"
                                                                xmlns:andraid="http://schenas.anrookkres/android"
                                                                xmlns:tools="http://schemas.androd/tools"
/>
                                                               <RelativeLavaut
                                                                 android:id="@deid|helloText']
                                                                 android:layout_width="wrap_conentent"
</RelativeLayout>
                                                                 android: layout.height="wrap_content'
                                                                 android:text="Hello, World!"
                                                                 android:textSIze="24sp"
                                                                 android:layout_centerInPaParent"true'>
```

<TextView

> activity\_main.xml

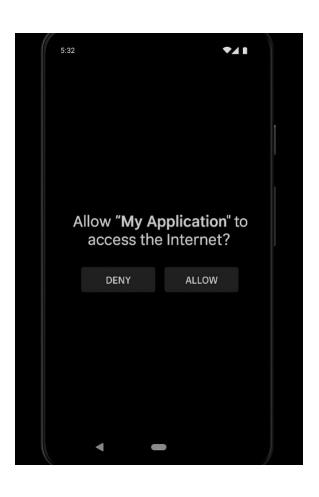
QLayoutin + ▶ # G 5 5 1 □ 11 Q

Hello, World!

## 2. Project Structure 2. Identify and explain the purpose of the AndroidManifest.xml file in your project. Modify it to request INTERNET permission.

Code -

```
<uses-permission
android:name="android.permission.INTERN
                                                android:theme="@style/Theme.MyApp">
ET" />
                                                    <activity
                                                android:name=".MainActivity">
                                                      <intent-filter>
<?xml version="1.0" encoding="utf-8"?>
                                                        <action
                                                android:name="android.intent.action.MAIN
<manifest
                                                " />
xmlns:android="http://schemas.android.co
m/apk/res/android"
                                                        <category
                                                android:name="android.intent.category.LAU
  package="com.example.myapp">
                                                NCHER" />
                                                      </intent-filter>
  <!-- Permission to access the internet -->
                                                    </activity>
  <uses-permission
android:name="android.permission.INTERN
ET" />
                                                  </application>
  <application
                                                </manifest>
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app name"
android:roundlcon="@mipmap/ic launcher
round"
    android:supportsRtl="true"
```



#### 3. Activity and Activity Life Cycle

- 3. Create an activity that logs lifecycle method calls (onCreate, onStart, etc.) in the Logcat.
- 4. Design an app with two activities and use lifecycle methods to save and restore a counter value during orientation changes.

#### Code:

```
1. MainActivity.java
                                                    private TextView counterTextView;
                                                    private Button incrementButton,
                                                  nextButton;
package com.example.lifecycleapp;
                                                    @Override
import android.content.Intent;
                                                    protected void onCreate(Bundle
import android.os.Bundle;
                                                  savedInstanceState) {
import android.util.Log;
                                                      super.onCreate(savedInstanceState);
import android.widget.Button;
                                                      Log.d(TAG, "onCreate");
import android.widget.TextView;
import androidx.annotation.NonNull;
                                                  setContentView(R.layout.activity main);
import
androidx.appcompat.app.AppCompatActivit
                                                      counterTextView =
у;
                                                  findViewById(R.id.counterText);
                                                      incrementButton =
                                                  findViewById(R.id.incrementButton);
public class MainActivity extends
AppCompatActivity {
                                                      nextButton =
                                                  findViewById(R.id.nextButton);
  private static final String TAG =
"MainActivity";
                                                      if (savedInstanceState != null) {
  private static final String COUNTER_KEY =
                                                         counter =
"counter_value";
                                                  savedInstanceState.getInt(COUNTER KEY);
                                                      }
  private int counter = 0;
```

```
@Override
    updateCounterText();
                                                     public void onResume() {
                                                       super.onResume();
    incrementButton.setOnClickListener(v -
                                                       Log.d(TAG, "onResume");
> {
                                                     }@Override
      counter++;
                                                     public void onPause() {
      updateCounterText();
                                                       super.onPause();
    });
                                                       Log.d(TAG, "onPause");
                                                     }
    nextButton.setOnClickListener(v -> {
      Intent intent = new
                                                     @Override
Intent(MainActivity.this,
                                                     public void onStop() {
SecondActivity.class);
                                                       super.onStop();
      startActivity(intent);
                                                       Log.d(TAG, "onStop");
    });
                                                     }
  }
  private void updateCounterText() {
    counterTextView.setText("Counter: " +
                                                     @Override
counter);
                                                     public void onDestroy() {
  }
                                                       super.onDestroy();
                                                       Log.d(TAG, "onDestroy");
  @Override
                                                     }
  public void onStart() {
    super.onStart();
                                                     @Override
    Log.d(TAG, "onStart");
                                                     public void
  }
                                                   onSaveInstanceState(@NonNull Bundle
                                                   outState) {
```

```
outState.putInt(COUNTER_KEY,
                                                    protected void onStart() {
counter);
                                                      super.onStart();
    super.onSaveInstanceState(outState);
                                                      Log.d(TAG, "onStart");
 }
                                                    }
2. SecondActivity.java
                                                    @Override
                                                    protected void onResume() {
package com.example.lifecycleapp;
                                                      super.onResume();
import android.os.Bundle;
                                                      Log.d(TAG, "onResume");
import android.util.Log;
                                                    }
import
                                                    @Override
androidx.appcompat.app.AppCompatActivit
                                                    protected void onPause() {
у;
                                                      super.onPause();
public class SecondActivity extends
AppCompatActivity {
                                                      Log.d(TAG, "onPause");
                                                    }
  private static final String TAG =
"SecondActivity";
                                                    @Override
                                                    protected void onStop() {
  @Override
                                                      super.onStop();
  protected void onCreate(Bundle
                                                      Log.d(TAG, "onStop");
savedInstanceState) {
                                                    }
    super.onCreate(savedInstanceState);
setContentView(R.layout.activity second);
                                                    @Override
    Log.d(TAG, "onCreate");
                                                    protected void onDestroy() {
  }
                                                      super.onDestroy();
                                                      Log.d(TAG, "onDestroy");
  @Override
                                                    }
```

## **}** ✓ 3. activity\_main.xml

xml

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

<LinearLayout
xmlns:android="http://schemas.android.co
m/apk/res/android"</pre>

android:orientation="vertical"
android:layout\_width="match\_parent"
android:layout\_height="match\_parent"
android:gravity="center"
android:background="#FAFAFA"

android:padding="20dp">

<TextView

android:id="@+id/counterText"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Counter: 0"

android:textSize="24sp"

android:textStyle="bold"

android:layout\_marginBottom="24dp"
/>

<Button

android:id="@+id/incrementButton"
android:layout\_width="wrap\_content"
android:layout\_height="wrap\_content"

android:text="Increment"
android:layout\_marginBottom="16dp"
/>

<Button

android:id="@+id/nextButton"
android:layout\_width="wrap\_content"
android:layout\_height="wrap\_content"
android:text="Next" />
</LinearLayout>

4. activity\_second.xml

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.co
m/apk/res/android"
 android:layout\_width="match\_parent"
 android:layout\_height="match\_parent"
 android:gravity="center"
 android:orientation="vertical"</pre>

android:background="#FFF">

<TextView

android:layout\_width="wrap\_content"
android:layout\_height="wrap\_content"

```
android:text="Welcome to Second
Activity"
    android:textSize="20sp"
    android:textStyle="bold" />
</LinearLayout>
5. AndroidManifest.xml
<manifest
xmlns:android="http://schemas.android.co
m/apk/res/android"
  package="com.example.lifecycleapp">
  <application
    android:allowBackup="true"
android:theme="@style/Theme.AppCompa
t.Light.NoActionBar"
    android:supportsRtl="true"
    android:label="@string/app_name">
    <activity
android:name=".SecondActivity" />
    <activity
android:name=".MainActivity">
      <intent-filter>
        <action
android:name="android.intent.action.MAIN
"/>
```

</manifest>



## 4. Fragment and Fragment Life Cycle

- 5. Create an activity with two fragments (e.g., Fragment A and Fragment B) that communicate with each other.
- 6. Implement lifecycle logging for a fragment and display the logs in a TextView inside the activity

MainActivity.java	@Override
package com.example.fragmentlifecycle;	<pre>protected void onCreate(Bundle savedInstanceState) {</pre>
	super.onCreate(savedInstanceState);
import android.os.Bundle;	setContentView(R.layout.activity_main);
import android.widget.TextView;	
import androidx.appcompat.app.AppCompatActivit y;	<pre>logTextView = findViewById(R.id.logTextView);</pre>
import androidx.fragment.app.FragmentManager;	FragmentManager fragmentManager = getSupportFragmentManager();
import androidx.fragment.app.FragmentTransactio n;	FragmentTransaction  fragmentTransaction =  fragmentManager.beginTransaction();
<pre>public class MainActivity extends AppCompatActivity implements LogListener {</pre>	FragmentA fragmentA = new FragmentA();
private TextView logTextView;	FragmentB fragmentB = new FragmentB();
<pre>private StringBuilder logBuilder = new StringBuilder();</pre>	fragmentA.setLogListener(this);
	fragmentB.setLogListener(this);

```
public class FragmentA extends Fragment {
                                                    private LogListener logListener;
fragmentTransaction.add(R.id.fragment con
tainer a, fragmentA);
                                                    @Override
fragmentTransaction.add(R.id.fragment_con
                                                    public void onAttach(Context context) {
tainer_b, fragmentB);
                                                      super.onAttach(context);
    fragmentTransaction.commit();
                                                      log("Fragment A onAttach");
  }
                                                    }
  @Override
                                                    @Override
  public void onLogReceived(String
                                                    public void onCreate(Bundle
message) {
                                                  savedInstanceState) {
                                                      super.onCreate(savedInstanceState);
logBuilder.append(message).append("\n");
                                                      log("Fragment A onCreate");
                                                    }
logTextView.setText(logBuilder.toString());
 }
                                                    @Override
}
                                                    public void onStart() {
                                                      super.onStart();
FragmentA.java
                                                      log("Fragment A onStart");
package com.example.fragmentlifecycle;
                                                    }
import android.content.Context;
                                                    private void log(String message) {
import android.os.Bundle;
                                                      Log.d("FragmentA", message);
import android.util.Log;
                                                      if (logListener != null)
import androidx.fragment.app.Fragment;
                                                  logListener.onLogReceived(message);
                                                    }
```

```
public void onCreate(Bundle
                                                   savedInstanceState) {
  public void setLogListener(LogListener
listener) {
                                                       super.onCreate(savedInstanceState);
    this.logListener = listener;
                                                       log("Fragment B onCreate");
 }
                                                     }
}
                                                     @Override
FragmentB.java
                                                     public void onStart() {
                                                       super.onStart();
package com.example.fragmentlifecycle;
                                                       log("Fragment B onStart");
                                                     }
import android.content.Context;
import android.os.Bundle;
                                                     @Override
import android.util.Log;
                                                     public void onResume() {
import androidx.fragment.app.Fragment;
                                                       super.onResume();
                                                       log("Fragment B onResume");
public class FragmentB extends Fragment {
                                                     }
  private LogListener logListener;
                                                     private void log(String message) {
  @Override
                                                       Log.d("FragmentB", message);
  public void onAttach(Context context) {
                                                       if (logListener != null)
    super.onAttach(context);
                                                   logListener.onLogReceived(message);
    log("Fragment B onAttach");
                                                     }
  }
                                                     public void setLogListener(LogListener
  @Override
                                                   listener) {
                                                       this.logListener = listener;
```

} activity\_main.xml

}

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.co
m/apk/res/android"</pre>

android:id="@+id/mainLayout"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="16dp">

<FrameLayout

android:id="@+id/fragment\_container\_a"
android:layout\_width="match\_parent"
android:layout\_height="wrap\_content"
android:layout\_weight="1" />

<FrameLayout

android:id="@+id/fragment\_container\_b"
android:layout\_width="match\_parent"
android:layout\_height="wrap\_content"
android:layout\_weight="1" />

<TextView

android:id="@+id/logTextView"

android:layout\_width="match\_parent"

android:layout\_height="200dp"

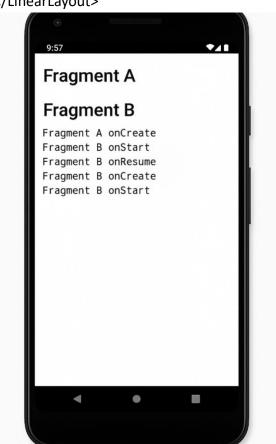
android:background="#EEEEEE"

android:padding="8dp"

android:textSize="14sp"

android:textColor="#000000" />

</LinearLayout>



#### 5. Views and View Groups

- 7. Design a layout using a LinearLayout to display a list of user profiles (name, email, and photo).
- 8. Use ConstraintLayout to create a responsive layout 10 that adapts to different screen sizes

```
1. LinearLayout Version (activity_main.xml)
```

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

<ScrollView xmlns:android="http://schemas.android.com/a pk/res/android"

android:layout\_width="match\_parent"
android:layout\_height="match\_parent">

#### <LinearLayout

android:orientation="vertical"
android:layout\_width="match\_parent"
android:layout\_height="wrap\_content"
android:padding="16dp">

#### <TextView

android:text="User Profiles"

android:textSize="24sp"

android:textStyle="bold"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginBottom="16dp"/>

<!-- Repeating profile block -->

#### <LinearLayout

android:orientation="horizontal"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:layout\_marginBottom="16dp">

#### <ImageView

android:src="@drawable/user1"
android:layout\_width="64dp"
android:layout\_height="64dp"
android:layout\_marginEnd="12dp"
android:scaleType="centerCrop"

android:background="@drawable/circle\_background" />

#### <LinearLayout

android:orientation="vertical"
android:layout\_width="wrap\_content"

android:layout height="wrap content">

```
<TextView
                                                     xmlns:android="http://schemas.android.com/a
          android:text="John Doe"
                                                     pk/res/android"
          android:textSize="18sp"
                                                    xmlns:app="http://schemas.android.com/apk/r
          android:textStyle="bold"
                                                     es-auto"
                                                       android:layout width="match parent"
android:layout width="wrap content"
                                                       android:layout height="match parent"
android:layout_height="wrap_content" />
                                                       android:padding="16dp">
        <TextView
                                                       <TextView
                                                         android:id="@+id/title"
android:text="john.doe@example.com"
                                                         android:text="User Profile"
android:layout_width="wrap_content"
                                                         android:textSize="24sp"
                                                         android:textStyle="bold"
android:layout_height="wrap_content" />
                                                         android:layout_width="wrap_content"
      </LinearLayout>
                                                         android:layout height="wrap content"
    </LinearLayout>
                                                     app:layout_constraintTop_toTopOf="parent"
    <!-- Repeat more profile blocks as needed --
                                                     app:layout_constraintStart_toStartOf="parent"
                                                    />
  </LinearLayout>
                                                       <ImageView
</ScrollView>
                                                         android:id="@+id/user_image"
                                                         android:src="@drawable/user1"
2. ConstraintLayout Version (Responsive)
                                                         android:layout width="80dp"
                                                         android:layout_height="80dp"
<?xml version="1.0" encoding="utf-8"?>
                                                         android:scaleType="centerCrop"
<androidx.constraintlayout.widget.ConstraintLa
```

yout

android:background="@drawable/circle backgr ound" app:layout constraintTop toBottomOf="@id/tit le" app:layout\_constraintStart\_toStartOf="parent" android:layout\_marginTop="16dp" /> <TextView android:id="@+id/user\_name" android:text="John Doe" android:textSize="18sp" android:textStyle="bold" android:layout\_width="0dp" android:layout\_height="wrap\_content" app:layout\_constraintStart\_toEndOf="@id/user \_image" app:layout\_constraintTop\_toTopOf="@id/user\_i mage" app:layout\_constraintEnd\_toEndOf="parent" android:layout\_marginStart="16dp"/> <TextView android:id="@+id/user\_email"

android:text="john.doe@example.com"

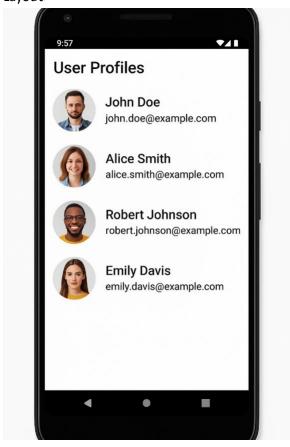
android:layout\_width="0dp"

android:layout\_height="wrap\_content"

app:layout\_constraintTop\_toBottomOf="@id/us
er\_name"

app:layout\_constraintStart\_toStartOf="@id/use
r name"

app:layout\_constraintEnd\_toEndOf="parent"
/></androidx.constraintlayout.widget.Constraint
Layout>



#### 6. Intents and Filters

- 9. Create an app with an Explicit Intent to navigate from one activity to another and pass a message between them.
  - 10. Implement an Implicit Intent to open a web page using the default browser..

#### Code:

```
super.onCreate(savedInstanceState);
1. MainActivity.java
                                                  setContentView(R.layout.activity_main);
package com.example.intentsandfilters;
                                                      openActivityButton =
import android.content.Intent;
                                                  findViewById(R.id.btnOpenActivity);
import android.net.Uri;
                                                      openWebButton =
                                                  findViewById(R.id.btnOpenWeb);
import android.os.Bundle;
import android.widget.Button;
                                                  openActivityButton.setOnClickListener(v -> {
import
androidx.appcompat.app.AppCompatActivit
                                                        Intent intent = new
                                                  Intent(MainActivity.this,
у;
                                                  SecondActivity.class);
                                                        intent.putExtra("message", "Hello
public class MainActivity extends
                                                  from MainActivity!");
AppCompatActivity {
                                                        startActivity(intent);
                                                      });
  Button openActivityButton,
openWebButton;
                                                      openWebButton.setOnClickListener(v -
                                                  > {
  @Override
  protected void onCreate(Bundle
savedInstanceState) {
```

```
Intent intent = new
Intent(Intent.ACTION VIEW,
                                                     msgTextView =
Uri.parse("https://www.example.com"));
                                                 findViewById(R.id.txtMessage);
      startActivity(intent);
                                                     String message =
    });
                                                 getIntent().getStringExtra("message");
  }
                                                     msgTextView.setText(message);
}
                                                   }
                                                 }
2. SecondActivity.java
                                                 3. activity main.xml
package com.example.intentsandfilters;
import android.os.Bundle;
                                                 <?xml version="1.0" encoding="utf-8"?>
import android.widget.TextView;
                                                 <LinearLayout
                                                 xmlns:android="http://schemas.android.co
                                                 m/apk/res/android"
import
                                                   android:orientation="vertical"
androidx.appcompat.app.AppCompatActivit
                                                   android:layout width="match parent"
у;
                                                   android:layout height="match parent"
                                                   android:gravity="center"
public class SecondActivity extends
AppCompatActivity {
                                                   android:padding="16dp">
  TextView msgTextView;
                                                   <Button
                                                     android:id="@+id/btnOpenActivity"
  @Override
                                                     android:layout_width="wrap_content"
  protected void onCreate(Bundle
                                                     android:layout height="wrap content"
savedInstanceState) {
                                                     android:text="OPEN ACTIVITY" />
    super.onCreate(savedInstanceState);
setContentView(R.layout.activity second);
                                                   <Button
```

```
android:id="@+id/btnOpenWeb"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:text="OPEN WEB PAGE"
    android:layout_marginTop="20dp"/>
</LinearLayout>
4. activity second.xml
                                                  }
package com.example.intentsandfilters;
import android.os.Bundle;
import android.widget.TextView;
import
androidx.appcompat.app.AppCompatActivit
у;
public class SecondActivity extends
AppCompatActivity {
  TextView msgTextView;
  @Override
  protected void onCreate(Bundle
savedInstanceState) {
    super.onCreate(savedInstanceState);
```

```
setContentView(R.layout.activity second);
     msgTextView =
findViewById(R.id.txtMessage);
     String message =
getIntent().getStringExtra("message");
     msgTextView.setText(message);
  age MainActivity
                                     OPEN ACTIVITY
                                     OPEN WEB PAGE
 Bx@excete"pll.app.expictivite)
```

#### 7. Adapters

- 11.Create a RecyclerView to display a list of items (e.g., a to-do list). Use a custom adapter to bind the data.
  - 12. Implement a Spinner with an ArrayAdapter to display a list of countries.

#### Code:

1. activity\_main.xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout</pre>

xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"
android:orientation="vertical"
android:padding="16dp"
android:layout height="match parent">

<TextView

android:text="Adapters"

android:textSize="24sp"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginBottom="16dp"/>

<androidx.recyclerview.widget.RecyclerView

android:id="@+id/recyclerView"
android:layout width="match parent"

android:layout\_height="wrap\_content"/>

<Spinner

android:id="@+id/spinner"
android:layout\_width="match\_parent"
android:layout\_height="wrap\_content"
android:layout\_marginTop="16dp"/>

</LinearLayout>

2. MainActivity.kt

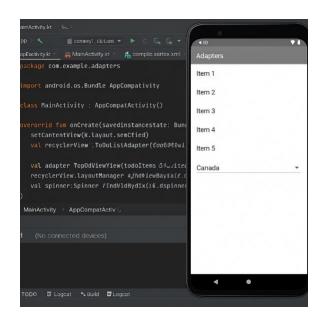
package com.example.adapters

import android.os.Bundle
import android.widget.ArrayAdapter
import android.widget.Spinner

```
recyclerView.adapter =
import
androidx.appcompat.app.AppCompatActivit
                                                  ToDoListAdapter(todoItems)
У
import
                                                       // Spinner - Countries
androidx.recyclerview.widget.LinearLayout
                                                       val countries = arrayOf("India", "USA",
Manager
                                                  "Canada", "UK", "Australia")
import
androidx.recyclerview.widget.RecyclerView
                                                       spinner = findViewById(R.id.spinner)
                                                       val adapter = ArrayAdapter(this,
                                                  android.R.layout.simple_spinner dropdown
class MainActivity : AppCompatActivity() {
                                                  _item, countries)
                                                       spinner.adapter = adapter
  private lateinit var recyclerView:
                                                    }
RecyclerView
                                                  }
  private lateinit var spinner: Spinner
                                                      3. ToDoListAdapter.kt
  override fun
onCreate(savedInstanceState: Bundle?) {
                                                  package com.example.adapters
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity main)
                                                  import android.view.LayoutInflater
                                                  import android.view.View
                                                  import android.view.ViewGroup
    // Sample To-Do List
                                                  import android.widget.TextView
    val todoltems = listOf("Item 1", "Item
2", "Item 3", "Item 4", "Item 5")
                                                  import
                                                  androidx.recyclerview.widget.RecyclerView
    recyclerView =
findViewById(R.id.recyclerView)
                                                  class ToDoListAdapter(private val items:
                                                  List<String>):
    recyclerView.layoutManager =
                                                  RecyclerView.Adapter<ToDoListAdapter.Vie
LinearLayoutManager(this)
                                                  wHolder>() {
```

```
class ViewHolder(itemView: View):
RecyclerView.ViewHolder(itemView) {
    val itemText: TextView =
itemView.findViewById(android.R.id.text1)
  }
  override fun onCreateViewHolder(parent:
ViewGroup, viewType: Int): ViewHolder {
    val view =
LayoutInflater.from(parent.context)
.inflate(android.R.layout.simple_list_item_1
, parent, false)
    return ViewHolder(view)
  }
  override fun getItemCount(): Int =
items.size
  override fun onBindViewHolder(holder:
ViewHolder, position: Int) {
    holder.itemText.text = items[position]
  }
```

}



#### 8. Dialogs

- 13.Create an AlertDialog with "Yes" and "No" buttons. Display a Toast message based on the user's choice.
  - 14. Implement a DatePickerDialog and display the selected date in a TextView.

#### Code:

MainActivity.java package com.example.dialogdemo; Button alertBtn, dateBtn; TextView dateTextView; import android.app.DatePickerDialog; import android.content.DialogInterface; @Override import android.os.Bundle; protected void onCreate(Bundle savedInstanceState) { import android.view.View; super.onCreate(savedInstanceState); import android.widget.Button; import android.widget.DatePicker; setContentView(R.layout.activity main); import android.widget.TextView; import android.widget.Toast; alertBtn = findViewById(R.id.alertBtn); import dateBtn = findViewById(R.id.dateBtn); androidx.appcompat.app.AlertDialog; dateTextView = import findViewById(R.id.dateTextView); androidx.appcompat.app.AppCompatActivit у; import java.util.Calendar; // AlertDialog alertBtn.setOnClickListener(view -> { public class MainActivity extends AlertDialog.Builder builder = new AppCompatActivity { AlertDialog.Builder(MainActivity.this); builder.setTitle("Confirmation")

```
.setMessage("Do you want to
                                                           (view1, year1, month1,
continue?")
                                                  dayOfMonth) -> {
          .setPositiveButton("Yes", (dialog,
                                                             String selectedDate =
                                                  dayOfMonth + "/" + (month1 + 1) + "/" +
which) -> {
                                                  year1;
Toast.makeText(MainActivity.this, "You
                                                             dateTextView.setText("Selected
clicked Yes", Toast.LENGTH_SHORT).show();
                                                  Date: " + selectedDate);
          })
                                                           }, year, month, day);
          .setNegativeButton("No",
                                                        datePickerDialog.show();
(dialog, which) -> {
                                                      });
                                                    }
Toast.makeText(MainActivity.this, "You
clicked No", Toast.LENGTH SHORT).show();
                                                  }
          })
          .show();
                                                  activity_main.xml
    });
                                                  <?xml version="1.0" encoding="utf-8"?>
    // DatePickerDialog
                                                  <LinearLayout
                                                  xmlns:android="http://schemas.android.co
    dateBtn.setOnClickListener(view -> {
                                                  m/apk/res/android"
      final Calendar calendar =
                                                    android:layout width="match parent"
Calendar.getInstance();
                                                    android:layout_height="match_parent"
      int year =
calendar.get(Calendar.YEAR);
                                                    android:gravity="center"
      int month =
                                                    android:orientation="vertical"
calendar.get(Calendar.MONTH);
                                                    android:padding="24dp">
      int day =
calendar.get(Calendar.DAY OF MONTH);
                                                    <Button
                                                      android:id="@+id/alertBtn"
      DatePickerDialog datePickerDialog =
                                                      android:layout_width="wrap_content"
new DatePickerDialog(MainActivity.this,
```

android:layout\_height="wrap\_content"
android:text="Show Alert Dialog" />

#### <Button

android:id="@+id/dateBtn"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="20dp"

android:text="Pick a Date" />

#### <TextView

android:id="@+id/dateTextView"

android:layout\_width="wrap\_content"

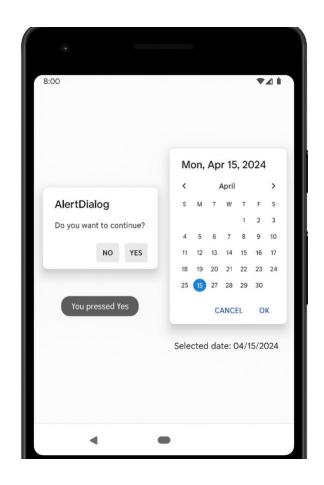
android:layout\_height="wrap\_content"

android:layout\_marginTop="20dp"

android:text="Selected Date:"

android:textSize="18sp" />

</LinearLayout>



#### 9. Menus

15.Add an Options Menu to an activity with actions like "Settings" and "Logout." Handle click events for these options.

16. Implement a Popup Menu that appears when a button is clicked.

#### Code:

```
}
   1. MainActivity.java
package com.example.menus;
                                                   // Options Menu
import android.os.Bundle;
                                                   @Override
import android.view.Menu;
                                                   public boolean
                                                 onCreateOptionsMenu(Menu menu) {
import android.view.MenuInflater;
                                                      MenuInflater inflater =
import android.view.MenuItem;
                                                 getMenuInflater();
import android.view.View;
                                                     inflater.inflate(R.menu.options menu,
import android.widget.PopupMenu;
                                                 menu);
import android.widget.Toast;
                                                     return true;
import
                                                   }
androidx.appcompat.app.AppCompatActivit
у;
                                                    @Override
                                                   public boolean
public class MainActivity extends
                                                 onOptionsItemSelected(MenuItem item) {
AppCompatActivity {
                                                     switch (item.getItemId()) {
                                                       case R.id.settings:
  @Override
                                                          Toast.makeText(this, "Settings
  protected void onCreate(Bundle
                                                 clicked", Toast.LENGTH_SHORT).show();
savedInstanceState) {
                                                          return true;
    super.onCreate(savedInstanceState);
                                                        case R.id.logout:
setContentView(R.layout.activity main);
```

```
Toast.makeText(this, "Logout
                                                          case R.id.share:
clicked", Toast.LENGTH SHORT).show();
                                                            Toast.makeText(this, "Share
                                                 clicked", Toast.LENGTH_SHORT).show();
        return true;
      default:
                                                            return true;
        return
                                                          default:
super.onOptionsItemSelected(item);
                                                            return false;
    }
                                                       }
  }
                                                      });
  // Popup Menu
                                                      popup.show();
  public void showPopup(View view) {
                                                   }
    PopupMenu popup = new
                                                 }
PopupMenu(this, view);
                                                     2. activity main.xml
popup.getMenuInflater().inflate(R.menu.po
pup_menu, popup.getMenu());
                                                 <?xml version="1.0" encoding="utf-8"?>
                                                 <RelativeLayout
                                                 xmlns:android="http://schemas.android.co
                                                 m/apk/res/android"
popup.setOnMenuItemClickListener(item ->
                                                 xmlns:tools="http://schemas.android.com/t
      switch (item.getItemId()) {
                                                 ools"
        case R.id.edit:
                                                   android:layout width="match parent"
          Toast.makeText(this, "Edit
clicked", Toast.LENGTH SHORT).show();
                                                   android:layout height="match parent"
                                                   tools:context=".MainActivity">
          return true;
        case R.id.delete:
          Toast.makeText(this, "Delete
                                                   <Button
clicked", Toast.LENGTH SHORT).show();
                                                      android:id="@+id/showMenuButton"
          return true;
```

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="SHOW MENU"
android:layout_centerInParent="true"
android:onClick="showPopup"/>
</RelativeLayout>
```

## 3. res/menu/popup\_menu.xml

```
<menu
xmlns:android="http://schemas.android.co
m/apk/res/android">
```

```
<item
android:id="@+id/edit"
android:title="Edit" />
<item
android:id="@+id/delete"
android:title="Delete" />
<item
android:d="@+id/share"
android:title="Share" />
</menu>
```



#### 10. Notifications

AppCompatActivity {

- 17. Create a simple notification that displays when a button is clicked.
- 18. Implement a notification with a pending intent that opens a new activity when clicked

Code: private static final String CHANNEL ID = MainActivity.java "demo channel"; package com.example.notificationdemo; @Override import android.app.NotificationChannel; protected void onCreate(Bundle import android.app.NotificationManager; savedInstanceState) { import android.app.PendingIntent; super.onCreate(savedInstanceState); import android.content.Intent; setContentView(R.layout.activity main); import android.os.Build; import android.os.Bundle; createNotificationChannel(); import android.view.View; import android.widget.Button; Button simpleBtn = findViewById(R.id.simpleNotificationBtn); Button intentBtn = import findViewById(R.id.pendingIntentBtn); androidx.appcompat.app.AppCompatActivit у; simpleBtn.setOnClickListener(view -> import showSimpleNotification()); androidx.core.app.NotificationCompat; public class MainActivity extends intentBtn.setOnClickListener(view ->

showNotificationWithIntent());

}

```
new NotificationCompat.Builder(this,
  private void showSimpleNotification() {
                                                   CHANNEL_ID)
    NotificationCompat.Builder builder =
new NotificationCompat.Builder(this,
                                                   .setSmallIcon(R.drawable.ic launcher foreg
CHANNEL ID)
                                                   round)
                                                            .setContentTitle("PendingIntent
.setSmallIcon(R.drawable.ic launcher foreg
                                                   Notification")
round)
                                                            .setContentText("Tap to open
         .setContentTitle("Simple
                                                   SecondActivity")
Notification")
                                                            .setContentIntent(pendingIntent)
         .setContentText("This is a basic
notification.")
                                                            .setAutoCancel(true)
.setPriority(NotificationCompat.PRIORITY D
                                                   .setPriority(NotificationCompat.PRIORITY H
EFAULT);
                                                   IGH);
    NotificationManager manager =
                                                        NotificationManager manager =
get System Service (Notification Manager. class\\
                                                   get System Service (Notification Manager. class\\
);
                                                   );
    manager.notify(1, builder.build());
                                                        manager.notify(2, builder.build());
  }
                                                     }
  private void showNotificationWithIntent()
                                                      private void createNotificationChannel() {
{
                                                        if (Build.VERSION.SDK INT >=
                                                   Build.VERSION_CODES.O) {
    Intent intent = new Intent(this,
SecondActivity.class);
                                                          CharSequence name = "Demo
                                                   Channel";
    PendingIntent pendingIntent =
PendingIntent.getActivity(this, 0, intent,
                                                          String description = "Channel for
PendingIntent.FLAG IMMUTABLE);
                                                   basic demo notifications";
```

NotificationCompat.Builder builder =

```
int importance =
NotificationManager.IMPORTANCE DEFAUL
                                                 public class SecondActivity extends
T;
                                                 AppCompatActivity {
                                                    @Override
      NotificationChannel channel = new
                                                   protected void onCreate(Bundle
NotificationChannel(CHANNEL_ID, name,
                                                 savedInstanceState) {
importance);
                                                      super.onCreate(savedInstanceState);
      channel.setDescription(description);
                                                      TextView tv = new TextView(this);
                                                     tv.setText("You opened SecondActivity
      NotificationManager manager =
                                                 via notification!");
getSystemService(NotificationManager.class
                                                      tv.setTextSize(22);
);
                                                     setContentView(tv);
manager.createNotificationChannel(channel
                                                   }
);
                                                 }
    }
 }
                                                 res/layout/activity main.xml
}
                                                 <?xml version="1.0" encoding="utf-8"?>
SecondActivity.java
                                                 <LinearLayout
                                                 xmlns:android="http://schemas.android.co
                                                 m/apk/res/android"
package com.example.notificationdemo;
                                                   android:orientation="vertical"
                                                 android:layout_width="match_parent"
import android.os.Bundle;
                                                   android:layout_height="match_parent"
import android.widget.TextView;
                                                 android:gravity="center"
                                                   android:padding="16dp">
import
androidx.appcompat.app.AppCompatActivit
                                                   <Button
у;
```

android:id="@+id/simpleNotificationBtn"
 android:layout\_width="wrap\_content"
 android:layout\_height="wrap\_content"
 android:text="Show Simple
Notification" />

#### <Button

android:id="@+id/pendingIntentBtn"

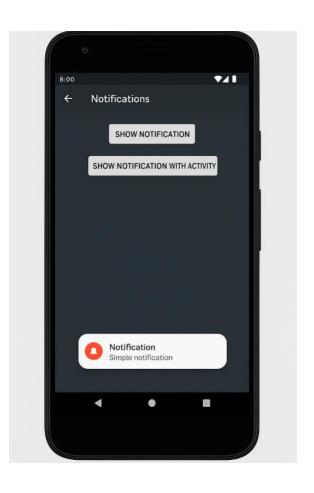
android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:text="Show Notification with
Intent" />

</LinearLayout>



### 11. Introduction to Database (SQLite and Firebase)

19.Create an SQLite database to store user information (name, email). Create a form to add data and a ListView to display it.

20.Use Firebase Realtime Database to create an app that allows users to post and view messages.

```
Code:
                                                    android:layout width="match parent"
activity main.xml
                                                    android:layout_height="wrap_content"
                                                />
<LinearLayout
xmlns:android="http://schemas.android.co
m/apk/res/android"
                                                  <Button
  android:layout_width="match_parent"
                                                    android:id="@+id/btnAdd"
  android:layout height="match parent"
                                                    android:text="ADD"
  android:orientation="vertical"
                                                    android:layout_width="wrap_content"
  android:padding="16dp">
                                                    android:layout height="wrap content"
                                                android:layout gravity="center horizontal"
  <EditText
                                                    android:layout marginTop="10dp"/>
    android:id="@+id/editName"
    android:hint="Name"
                                                  <ListView
    android:layout width="match parent"
                                                    android:id="@+id/listView"
    android:layout height="wrap content"
/>
                                                    android:layout_width="match_parent"
                                                    android:layout height="wrap content"
                                                />
  <EditText
                                                </LinearLayout>
    android:id="@+id/editEmail"
    android:hint="Email"
```

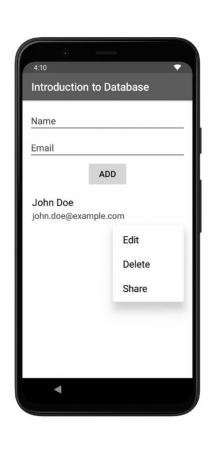
```
adapter = new ArrayAdapter<>(this,
MainActivity.java
                                                   android.R.layout.simple list item 1,
public class MainActivity extends
                                                   userList);
AppCompatActivity {
                                                        listView.setAdapter(adapter);
                                                        loadData();
  EditText editName, editEmail;
  Button btnAdd;
                                                        btnAdd.setOnClickListener(v -> {
  ListView listView;
                                                          String name =
  ArrayList<String> userList = new
                                                   editName.getText().toString();
ArrayList<>();
                                                          String email =
  ArrayAdapter<String> adapter;
                                                   editEmail.getText().toString();
  DBHelper db;
                                                          db.insertUser(name, email);
                                                          loadData();
  @Override
                                                          editName.setText("");
  protected void onCreate(Bundle
                                                          editEmail.setText("");
savedInstanceState) {
                                                        });
    super.onCreate(savedInstanceState);
                                                      }
setContentView(R.layout.activity main);
                                                      private void loadData() {
                                                        userList.clear();
    editName =
findViewById(R.id.editName);
                                                        Cursor cursor = db.getUsers();
    editEmail =
                                                        while (cursor.moveToNext()) {
findViewById(R.id.editEmail);
                                                          userList.add(cursor.getString(1) +
    btnAdd = findViewById(R.id.btnAdd);
                                                   "\n" + cursor.getString(2));
    listView = findViewById(R.id.listView);
                                                        }
    db = new DBHelper(this);
                                                        adapter.notifyDataSetChanged();
                                                     }
```

```
}
                                                      SQLiteDatabase db =
                                                 this.getWritableDatabase();
✓ DBHelper.java
                                                      ContentValues cv = new
public class DBHelper extends
                                                  ContentValues();
SQLiteOpenHelper {
                                                      cv.put("name", name);
                                                      cv.put("email", email);
  public DBHelper(Context context) {
                                                      db.insert("users", null, cv);
    super(context, "UserDB", null, 1);
                                                    }
  }
                                                    public Cursor getUsers() {
  @Override
                                                      SQLiteDatabase db =
  public void onCreate(SQLiteDatabase db)
                                                  this.getReadableDatabase();
{
                                                      return db.rawQuery("SELECT * FROM
    db.execSQL("CREATE TABLE users(id
                                                  users", null);
INTEGER PRIMARY KEY AUTOINCREMENT,
                                                    }
name TEXT, email TEXT)");
                                                  }
  }
                                                  activity main.xml
  @Override
  public void on Upgrade (SQLite Database
                                                  <LinearLayout
db, int oldVersion, int newVersion) {
                                                  xmlns:android="http://schemas.android.co
                                                  m/apk/res/android"
    db.execSQL("DROP TABLE IF EXISTS
users");
                                                    android:layout width="match parent"
    onCreate(db);
                                                    android:layout height="match parent"
  }
                                                    android:orientation="vertical"
                                                    android:padding="16dp">
  public void insertUser(String name, String
email) {
                                                    <EditText
                                                      android:id="@+id/messageInput"
```

```
android:hint="Enter your message"
                                                   Button sendBtn;
    android:layout width="match parent"
                                                   TextView messageView;
    android:layout height="wrap content"
                                                   DatabaseReference databaseReference;
/>
                                                   @Override
  <Button
                                                   protected void onCreate(Bundle
    android:id="@+id/sendBtn"
                                                 savedInstanceState) {
    android:text="Send"
                                                     super.onCreate(savedInstanceState);
    android:layout_width="wrap content"
                                                 setContentView(R.layout.activity main);
    android:layout_height="wrap_content"
/>
                                                     messageInput =
                                                 findViewById(R.id.messageInput);
  <TextView
                                                     sendBtn = findViewById(R.id.sendBtn);
    android:id="@+id/messageView"
                                                     messageView =
    android:text="Messages will appear
                                                 findViewById(R.id.messageView);
here"
    android:layout width="match parent"
                                                     databaseReference =
    android:layout height="wrap content"
                                                 FirebaseDatabase.getInstance().getReferenc
    android:paddingTop="20dp" />
                                                 e("Messages");
</LinearLayout>
                                                     sendBtn.setOnClickListener(v -> {
                                                       String message =
                                                 messageInput.getText().toString();
MainActivity.java
                                                       String id =
public class MainActivity extends
                                                 databaseReference.push().getKey();
AppCompatActivity {
                                                 databaseReference.child(id).setValue(messa
  EditText messageInput;
                                                 ge);
```

```
});
databaseReference.addValueEventListener(
new ValueEventListener() {
      @Override
      public void onDataChange(@NonNull
DataSnapshot snapshot) {
        StringBuilder messages = new
StringBuilder();
        for (DataSnapshot ds:
snapshot.getChildren()) {
messages.append(ds.getValue(String.class)).
append("\n");
        }
messageView.setText(messages.toString());
      }
      @Override
      public void onCancelled(@NonNull
DatabaseError error) {
        Toast.makeText(MainActivity.this,
"Error loading messages",
Toast.LENGTH_SHORT).show();
      }
    });
```

messageInput.setText("");



}

}

#### 12. Cursors and Content Values

21. Write a query to fetch all rows from an SQLite table and display them in a RecyclerView using a Cursor.

22.Use ContentValues to insert a new record into an 6 SQLite database

## Code:

```
public void onCreate(SQLiteDatabase db)
MyDatabaseHelper.java
                                                      String query = "CREATE TABLE" +
public class MyDatabaseHelper extends
                                                 TABLE NAME + " (" +
SQLiteOpenHelper {
                                                          COL_ID + " INTEGER PRIMARY KEY
                                                  AUTOINCREMENT, "+
  private static final String DB_NAME =
                                                          COL NAME + " TEXT)";
"students.db";
                                                      db.execSQL(query);
  private static final int DB VERSION = 1;
                                                    }
  public static final String TABLE NAME =
                                                    @Override
"students";
                                                    public void on Upgrade (SQLite Database
  public static final String COL ID = " id";
                                                  db, int oldVersion, int newVersion) {
  public static final String COL_NAME =
                                                      db.execSQL("DROP TABLE IF EXISTS " +
"name";
                                                  TABLE NAME);
                                                      onCreate(db);
  public MyDatabaseHelper(Context
                                                    }
context) {
    super(context, DB_NAME, null,
DB_VERSION);
                                                    public void insertStudent(String name) {
  }
                                                      SQLiteDatabase db =
                                                 this.getWritableDatabase();
  @Override
```

```
ContentValues values = new
ContentValues();
                                                      recyclerView =
                                                  findViewById(R.id.recyclerView);
    values.put(COL NAME, name);
    db.insert(TABLE_NAME, null, values);
                                                      dbHelper = new
                                                  MyDatabaseHelper(this);
  }
                                                      // Insert a student using ContentValues
  public Cursor getAllStudents() {
                                                      dbHelper.insertStudent("Kamlesh");
    SQLiteDatabase db =
this.getReadableDatabase();
    return db.rawQuery("SELECT * FROM "
                                                      // Load students using Cursor
+ TABLE_NAME, null);
                                                      loadStudents();
 }
}
                                                      recyclerView.setLayoutManager(new
                                                  LinearLayoutManager(this));
MainActivity.java
                                                      adapter = new
public class MainActivity extends
                                                  StudentAdapter(studentList);
AppCompatActivity {
                                                      recyclerView.setAdapter(adapter);
                                                    }
  MyDatabaseHelper dbHelper;
  RecyclerView recyclerView;
                                                    private void loadStudents() {
  StudentAdapter adapter;
                                                      studentList = new ArrayList<>();
  ArrayList<String> studentList;
                                                      Cursor cursor =
                                                  dbHelper.getAllStudents();
  @Override
                                                      if (cursor.moveToFirst()) {
  protected void onCreate(Bundle
                                                        do {
savedInstanceState) {
                                                          String name =
    super.onCreate(savedInstanceState);
                                                  cursor.getString(cursor.getColumnIndexOrT
                                                  hrow("name"));
setContentView(R.layout.activity_main);
```

```
studentList.add(name);
                                                       return new ViewHolder(view);
      } while (cursor.moveToNext());
                                                    }
    }
    cursor.close();
                                                     @Override
  }
                                                     public void onBindViewHolder(@NonNull
                                                   ViewHolder holder, int position) {
}
                                                   holder.textView.setText(studentList.get(posi
StudentAdapter.java
                                                  tion));
                                                    }
public class StudentAdapter extends
RecyclerView.Adapter<StudentAdapter.View
Holder> {
                                                     @Override
                                                     public int getItemCount() {
  ArrayList<String> studentList;
                                                       return studentList.size();
                                                    }
  public StudentAdapter(ArrayList<String>
studentList) {
                                                     class ViewHolder extends
    this.studentList = studentList;
                                                   RecyclerView.ViewHolder {
  }
                                                       TextView textView;
                                                       ViewHolder(View view) {
  @NonNull
                                                         super(view);
  @Override
                                                         textView =
  public ViewHolder
                                                  view.findViewById(android.R.id.text1);
onCreateViewHolder(@NonNull ViewGroup
                                                       }
parent, int viewType) {
                                                    }
    View view =
LayoutInflater.from(parent.getContext()).infl
                                                  }
ate(android.R.layout.simple list item 1,
                                                   activity main.xml
parent, false);
```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.Constrain
tLayout</pre>

xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:app="http://schemas.android.com/a pk/res-auto"

android:layout\_width="match\_parent"
android:layout\_height="match\_parent">

<androidx.recyclerview.widget.RecyclerView
android:id="@+id/recyclerView"
android:layout\_width="0dp"
android:layout\_height="0dp"</pre>

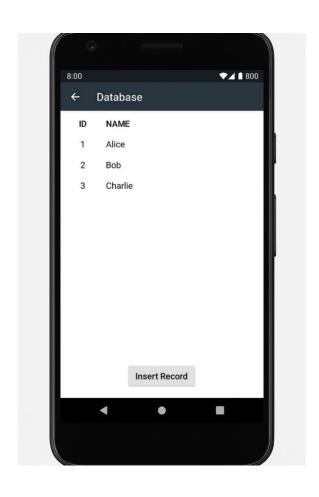
app:layout\_constraintTop\_toTopOf="parent"

app:layout\_constraintBottom\_toBottomOf=
"parent"

app:layout\_constraintStart\_toStartOf="pare
nt"

app:layout\_constraintEnd\_toEndOf="parent
"/>

</androidx.constraintlayout.widget.Constrai
ntLayout>



# 13. CURD Operations

- 23. Implement a complete SQLite CRUD operation:
- o Add a new record.
- o View all records in a RecyclerView.
- o Update a record.
- o Delete a record.

```
Code:
Step 1: SQLite Database Helper
                                                    @Override
                                                    public void on Upgrade (SQLite Database
public class DBHelper extends
                                                  db, int oldVersion, int newVersion) {
SQLiteOpenHelper {
                                                      db.execSQL("DROP TABLE IF EXISTS
  private static final String DB_NAME =
                                                  Users");
"UserDB";
                                                      onCreate(db);
  private static final int DB_VERSION = 1;
                                                    }
  public DBHelper(Context context) {
                                                    public void insertUser(String name, String
    super(context, DB_NAME, null,
                                                  email) {
DB VERSION);
                                                      SQLiteDatabase db =
  }
                                                  this.getWritableDatabase();
                                                      ContentValues cv = new
  @Override
                                                  ContentValues();
  public void onCreate(SQLiteDatabase db)
                                                      cv.put("name", name);
{
                                                      cv.put("email", email);
    db.execSQL("CREATE TABLE Users(id
                                                      db.insert("Users", null, cv);
INTEGER PRIMARY KEY AUTOINCREMENT,
name TEXT, email TEXT)");
                                                    }
  }
```

```
public void updateUser(int id, String
                                                    public class User {
name, String email) {
                                                      int id;
    SQLiteDatabase db =
                                                      String name;
this.getWritableDatabase();
                                                      String email;
    ContentValues cv = new
ContentValues();
    cv.put("name", name);
                                                      public User(int id, String name, String
                                                    email) {
    cv.put("email", email);
                                                        this.id = id;
    db.update("Users", cv, "id=?", new
String[]{String.valueOf(id)});
                                                        this.name = name;
  }
                                                        this.email = email;
                                                      }
  public void deleteUser(int id) {
                                                    }
    SQLiteDatabase db =
                                                    Step 3: User Adapter (RecyclerView)
this.getWritableDatabase();
                                                    public class UserAdapter extends
    db.delete("Users", "id=?", new
                                                    RecyclerView.Adapter<UserAdapter.UserVie
String[]{String.valueOf(id)});
                                                    wHolder> {
  }
                                                      private ArrayList<User> userList;
                                                      private Context context;
  public Cursor getAllUsers() {
                                                      private OnUserClickListener listener;
    SQLiteDatabase db =
this.getReadableDatabase();
                                                      public interface OnUserClickListener {
    return db.rawQuery("SELECT * FROM
                                                        void onEditClick(User user);
Users", null);
                                                        void onDeleteClick(User user);
  }
                                                      }
}
```

Step 2: Model Class

```
public UserAdapter(Context context,
                                                       holder.deleteBtn.setOnClickListener(v -
ArrayList<User> userList,
                                                   > listener.onDeleteClick(user));
OnUserClickListener listener) {
                                                     }
    this.context = context;
    this.userList = userList;
                                                     @Override
    this.listener = listener;
                                                     public int getItemCount() {
  }
                                                       return userList.size();
                                                     }
  @NonNull
  @Override
                                                     public static class UserViewHolder
  public UserViewHolder
                                                   extends RecyclerView.ViewHolder {
onCreateViewHolder(@NonNull ViewGroup
                                                       TextView name, email;
parent, int viewType) {
                                                       Button editBtn, deleteBtn;
    View view =
LayoutInflater.from(context).inflate(R.layout
.user_row, parent, false);
                                                       public UserViewHolder(@NonNull View
                                                   itemView) {
    return new UserViewHolder(view);
  }
                                                         super(itemView);
                                                          name =
                                                   itemView.findViewById(R.id.tvName);
  @Override
                                                         email =
  public void onBindViewHolder(@NonNull
                                                   itemView.findViewById(R.id.tvEmail);
UserViewHolder holder, int position) {
                                                         editBtn =
    User user = userList.get(position);
                                                   itemView.findViewById(R.id.btnEdit);
    holder.name.setText(user.name);
                                                         deleteBtn =
    holder.email.setText(user.email);
                                                   itemView.findViewById(R.id.btnDelete);
                                                       }
                                                     }
    holder.editBtn.setOnClickListener(v ->
listener.onEditClick(user));
                                                   }
```

```
recyclerView.setLayoutManager(new
Step 5: MainActivity
                                                  LinearLayoutManager(this));
public class MainActivity extends
                                                      userList = new ArrayList<>();
AppCompatActivity {
                                                      loadUsers();
  EditText etName, etEmail;
  Button btnAddUpdate;
                                                      btnAddUpdate.setOnClickListener(v -> {
  RecyclerView recyclerView;
                                                        String name =
  DBHelper dbHelper;
                                                  etName.getText().toString();
  ArrayList<User> userList;
                                                        String email =
  UserAdapter adapter;
                                                  etEmail.getText().toString();
  int updateUserId = -1;
                                                        if (updateUserId == -1) {
                                                           dbHelper.insertUser(name, email);
  @Override
                                                        } else {
  protected void onCreate(Bundle
savedInstanceState) {
                                                  dbHelper.updateUser(updateUserId, name,
                                                  email);
    super.onCreate(savedInstanceState);
                                                           updateUserId = -1;
setContentView(R.layout.activity main);
                                                           btnAddUpdate.setText("Add");
                                                        }
    etName = findViewById(R.id.etName);
    etEmail = findViewById(R.id.etEmail);
                                                        etName.setText("");
    btnAddUpdate =
                                                        etEmail.setText("");
findViewById(R.id.btnAddUpdate);
                                                        loadUsers();
    recyclerView =
                                                      });
findViewById(R.id.recyclerView);
                                                    }
    dbHelper = new DBHelper(this);
```

```
private void loadUsers() {
    userList.clear();
    Cursor cursor = dbHelper.getAllUsers();
    while (cursor.moveToNext()) {
      userList.add(new User(
        cursor.getInt(0),
         cursor.getString(1),
        cursor.getString(2)
      ));
    }
    adapter = new UserAdapter(this,
userList, new
UserAdapter.OnUserClickListener() {
      @Override
      public void onEditClick(User user) {
         etName.setText(user.name);
         etEmail.setText(user.email);
         updateUserId = user.id;
        btnAddUpdate.setText("Update");
      }
      @Override
      public void onDeleteClick(User user) {
         dbHelper.deleteUser(user.id);
        loadUsers();
      }
```

});

recyclerView.setAdapter(adapter);
}







# 24. Create an app that fetches data from a public API (e.g., OpenWeatherMap) and displays it in a TextView.

## Code:

activity\_main.xml

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

<LinearLayout
xmlns:android="http://schemas.android.co
m/apk/res/android"</pre>

android:layout\_width="match\_parent"

android:layout height="match parent"

android:orientation="vertical"

android:gravity="center"

android:padding="16dp">

<TextView

android:id="@+id/weatherText"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Fetching weather..."

android:textSize="20sp"/>

</LinearLayout>

MainActivity.java

import

and roid x. app compat. app. App Compat Activit

у;

import android.os.Bundle;

import android.os.StrictMode;

import android.widget.TextView;

import org.json.JSONObject;

import java.io.BufferedReader;

import java.io.InputStreamReader;

import java.net.HttpURLConnection;

import java.net.URL;

public class MainActivity extends

AppCompatActivity {

TextView weatherText;

String apiKey = "your\_api\_key"; //
Replace with your actual API key

String city = "London";

@Override

package com.example.weatherapp;

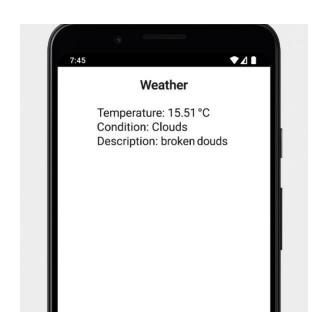
```
protected void onCreate(Bundle
                                                         BufferedReader reader = new
savedInstanceState) {
                                                  BufferedReader(new
                                                  InputStreamReader(conn.getInputStream())
    super.onCreate(savedInstanceState);
                                                  );
                                                         StringBuilder result = new
setContentView(R.layout.activity main);
                                                  StringBuilder();
    weatherText =
                                                         String line;
findViewById(R.id.weatherText);
                                                         while ((line = reader.readLine()) !=
    // Allow network on main thread (not
                                                  null) {
recommended for production)
                                                           result.append(line);
    StrictMode.setThreadPolicy(new
StrictMode.ThreadPolicy.Builder().permitAll(
                                                         }
).build());
                                                         JSONObject jsonObject = new
                                                  JSONObject(result.toString());
    fetchWeather();
  }
                                                         JSONObject main =
                                                  jsonObject.getJSONObject("main");
                                                         JSONObject weather =
  private void fetchWeather() {
                                                  jsonObject.getJSONArray("weather").getJSO
    try {
                                                  NObject(0);
      String urlString =
"https://api.openweathermap.org/data/2.5
                                                         double temp =
/weather?q=" + city + "&appid=" + apiKey +
                                                  main.getDouble("temp");
"&units=metric";
                                                         String condition =
      URL url = new URL(urlString);
                                                  weather.getString("main");
      HttpURLConnection conn =
                                                         String description =
(HttpURLConnection) url.openConnection();
                                                  weather.getString("description");
```

conn.setRequestMethod("GET");

```
String output = "Temperature: " +
temp + " °C\nCondition: " + condition +
"\nDescription: " + description;
weatherText.setText(output);

} catch (Exception e) {
weatherText.setText("Failed to fetch weather.");
e.printStackTrace();
}

}
```



# **Requirements**

- Internet permission in AndroidManifest.xml
- 2. API key from https://openweathermap.org/api