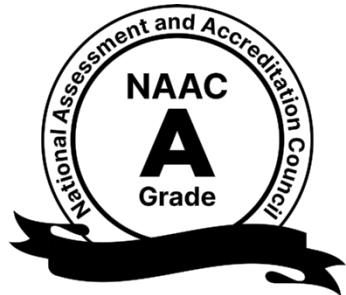




Ganpat University

॥ विद्यया समाजोत्कर्षः ॥



A.M. Patel Institute of Computer Studies

Fundamental of
Mobile Application
(P12A1FMA)

MCA SEM-2

VIDHEY H. DETROJA
(23034211007)

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<p>No. 1</p>	<h2 style="text-align: center;">Study of Android Studio IDE (Latest)</h2>
<p>Android Studio is the official Integrated Development Environment (IDE) for Android app development, backed by Google and JetBrains. It is built on the IntelliJ IDEA platform and provides a comprehensive set of tools for creating high-quality Android applications.</p> <p>Key Features of Android Studio:-</p> <p>1. Code Editor:</p> <ul style="list-style-type: none"> - Code completion: Provides code suggestions as you type. - Syntax highlighting: Highlights syntax errors and other coding issues. - Refactoring tools: Makes it easier to improve code structure and readability. - Linting: Identifies potential issues and bugs in your code. - Code navigation: Allows you to quickly jump between different parts of your project. <p>2. Design Tools:</p> <ul style="list-style-type: none"> - Layout Editor: Lets you visually design your app's user interface using drag-and-drop components. - Constraint Layout: A flexible layout that allows for complex designs with ease. - Preview windows: You can view different device screens and orientations. <p>3. Build and Compilation:</p> <ul style="list-style-type: none"> - Gradle-based build system: Manages project dependencies and builds your project. - Instant Run: Allows you to push code changes to the app without needing a full build. <p>4. Testing and Debugging:</p> <ul style="list-style-type: none"> - Android Emulator: Lets you test apps on various virtual Android devices. - JUnit and Espresso support: Enables you to run unit tests and UI tests. - Debugger: Helps you inspect variables and set breakpoints to find and fix bugs. <p>5. Performance and Profiling Tools:</p> <ul style="list-style-type: none"> - Memory, CPU, and network profiling: Helps you understand the performance characteristics of your app. - Allocation tracking: Monitors memory allocations and garbage collection events. <p>6. Version Control:</p> <ul style="list-style-type: none"> - Git integration: Seamlessly integrates with Git for version control and collaboration. - Change history: Allows you to review code changes and revert them if necessary. 	

7. Device Compatibility:

- API Level management: Helps you manage and understand which APIs are available on which devices.
- Screen compatibility tools: Makes sure your app works across various screen sizes and densities.

8. Cloud and Firebase Integration:

- Firebase services: Provides tools and APIs for services like analytics, real-time databases, authentication, and more.
- Cloud Storage: Easily integrates your app with Google Cloud services.

9. Project Management:

- Project structure view: Provides an organized way to navigate your project's files.
- Multiple module support: Helps you manage large projects with multiple modules.

10. Code Templates and Libraries:

- Code templates: Offers pre-built code for various Android components like Activities, Fragments, and Services.
- Library management: Makes it easy to add external libraries and dependencies to your project.

Updates and Extensions:-

- **Regular updates:** Android Studio receives frequent updates with bug fixes and new features.
- **Extensions:** Android Studio supports plugins and extensions for additional functionality.

Learning Android Studio:-

- **Online resources:** Official documentation, tutorials, and courses are available online to help you learn the IDE.
- **Community support:** Android Studio has an active community where you can seek help and share knowledge.

By staying up-to-date with the latest version of Android Studio and exploring its full range of features, you can improve your efficiency in developing Android apps and produce higher quality software.

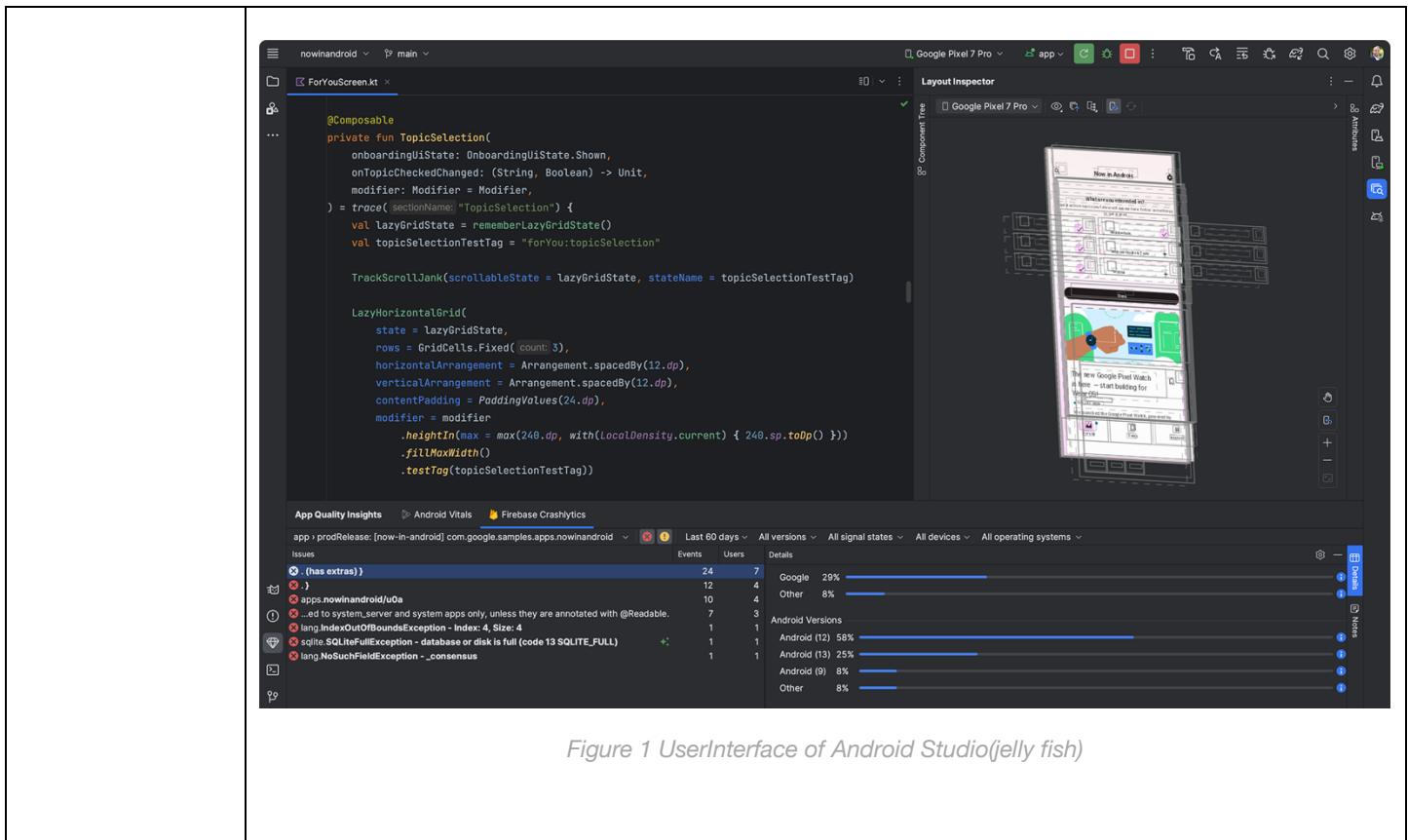
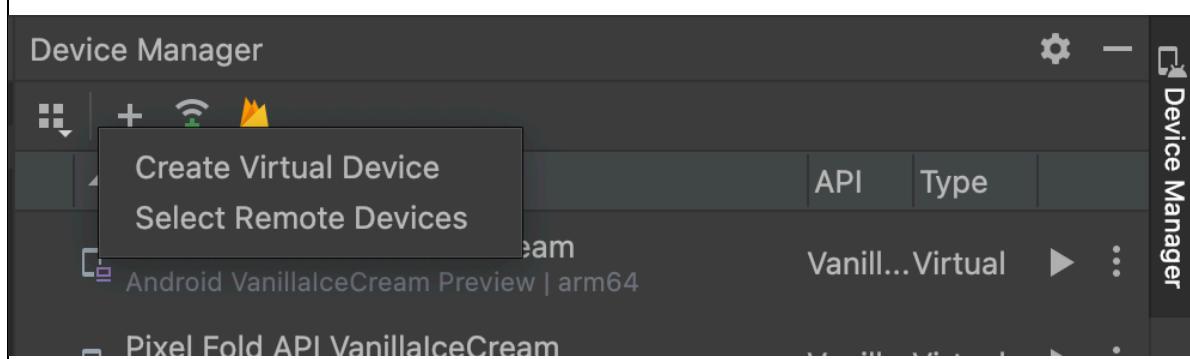
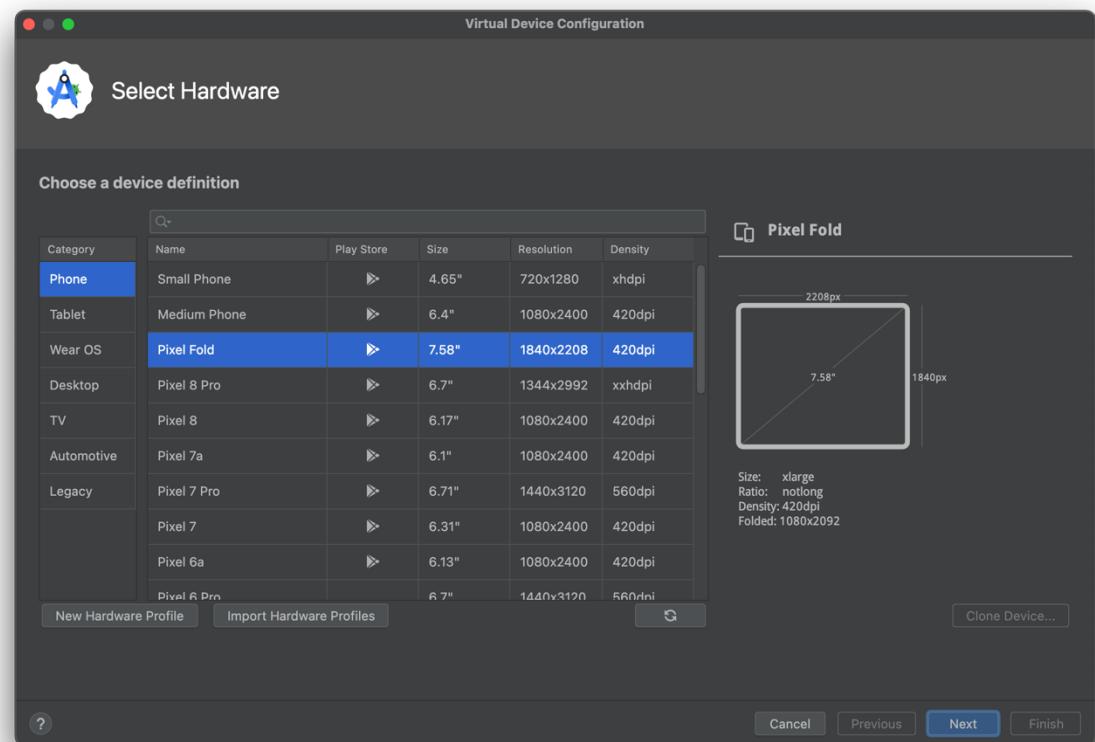


Figure 1 UserInterface of Android Studio(jelly fish)

No. 2	<h2 style="text-align: center;">Creation and Deletion of Virtual Devices</h2> <p>Create Virtual Devices:-</p> <p>Create new project, go to view in main menu.</p> <p>View>Tools Window>Device Manager.</p>  <p>Figure 2 Click on Create Virtual Devices.</p>  <p>Figure 3 Select Desirable Device then Click on Next Button</p>
-----------------	---

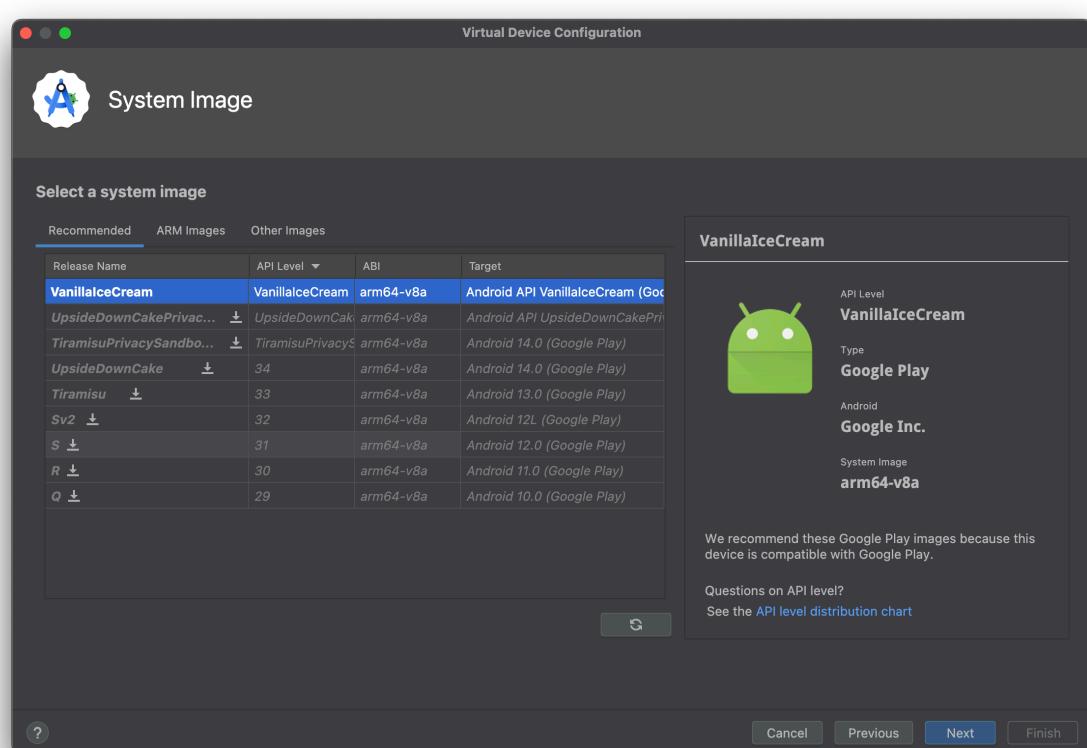


Figure 4 Select Android Version then Click on Next Button

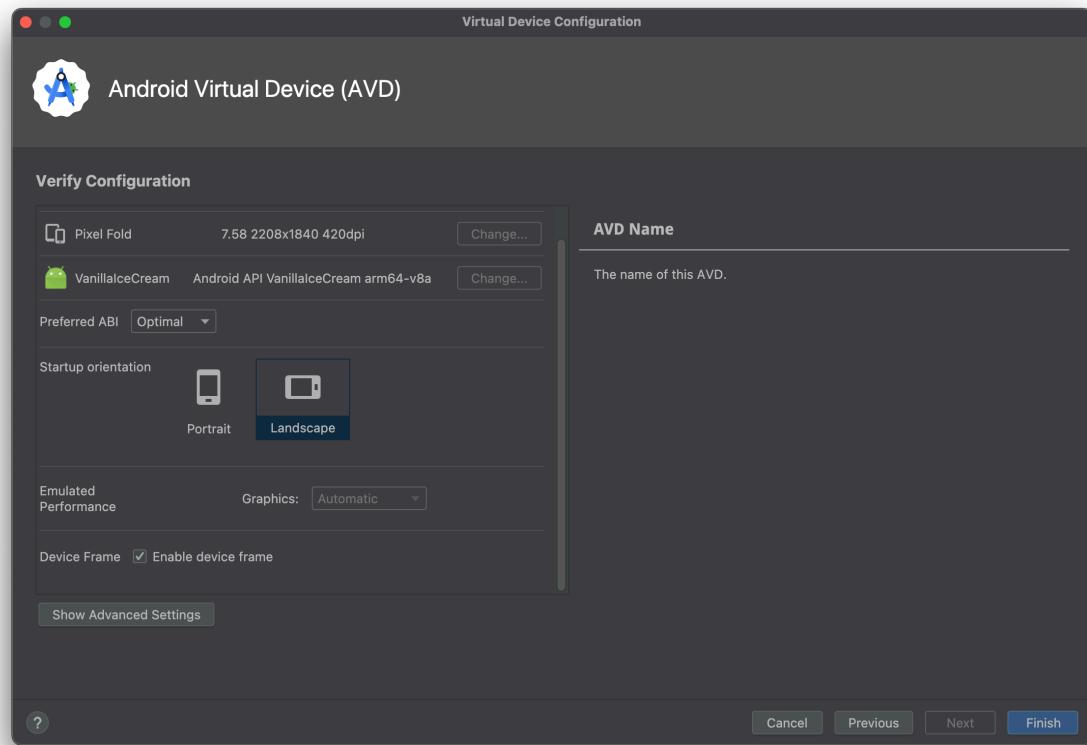


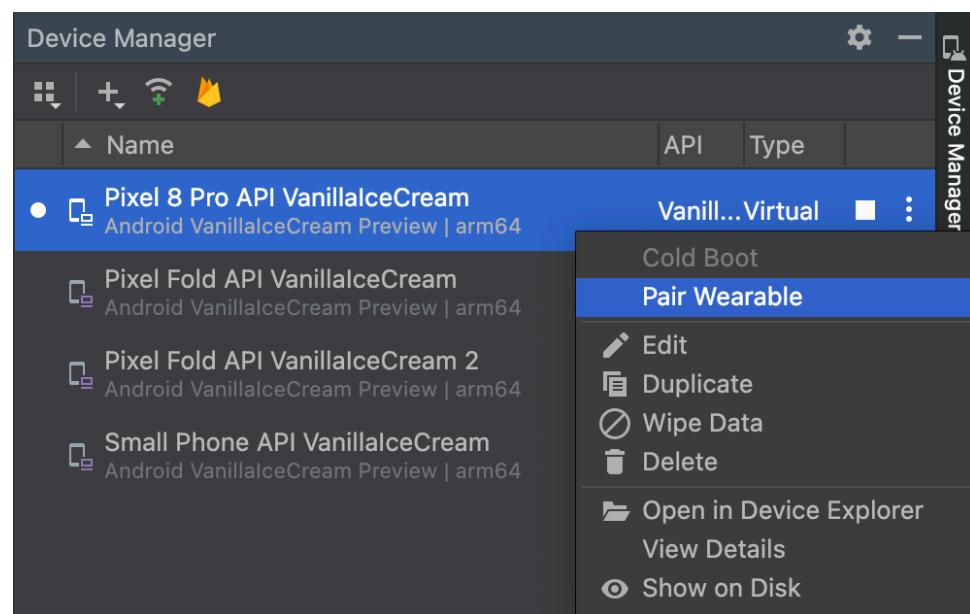
Figure 5 Select Orientation and Click on Finish Button



Figure 6 Pixel 8 Pro(Virtual Device)

Deletion Virtual Devices:-

View>Tools Window>Device Manager>Select Virtual Device>Delete



No. 3	Displaying “Welcome to MCA” in Virtual & Physical
MainActivity.java	<pre>package com.example.welcomemca; 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); } }</pre>
Activity_main.xml	<pre><?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:layout_width="207dp" android:layout_height="114dp" android:text="Welcome To Mca" android:textAlignment="center" android:textSize="45dp" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout></pre>
String.xml	<pre><resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.WelcomeMca" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --></pre>

```
</style>  
  
<style name="Theme.WelcomeMca" parent="Base.Theme.WelcomeMca" />  
</resources>
```

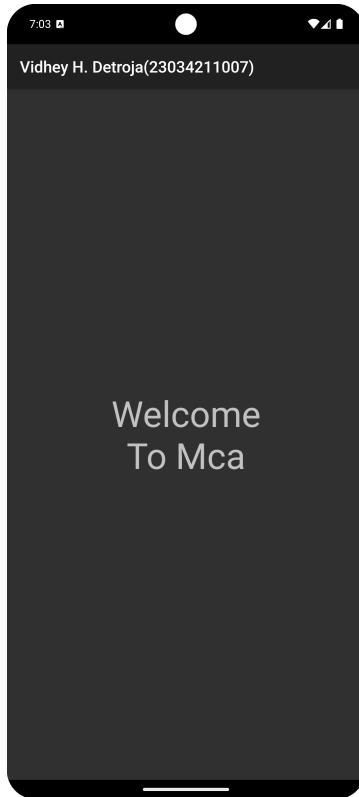


Figure 7 Showing "Welcome to Mca" using
TextView(Dark)

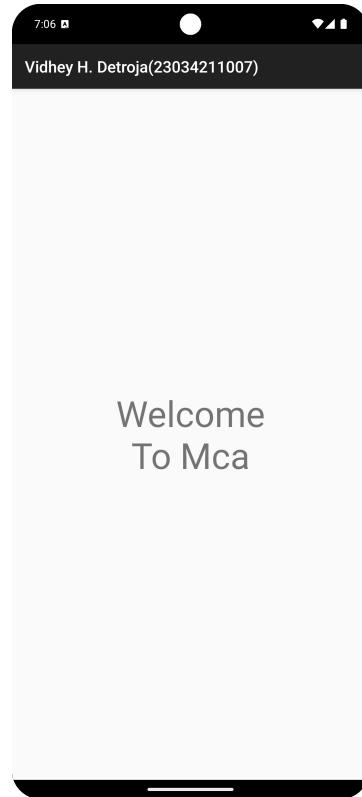


Figure 8 Showing "Welcome to Mca" using
TextView(Light)

No. 4	Use the resources - – Integer; String; Array; Boolean; Dimension, Colors in XML and Code Files
MainActivity.java	<pre>package com.example.resources; import static java.lang.Boolean.getBoolean; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.widget.RadioButton; public class MainActivity extends AppCompatActivity { @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); } }</pre>
Activity_main.xml	<pre><?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:layout_width="wrap_content" android:layout_height="wrap_content" android:text="@string/name" android:textAlignment="center" android:textSize="40dp" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintHorizontal_bias="0.054" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.091" /> <TextView android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="@string/no" android:textAlignment="center" android:textSize="40dp" android:textColor="@color/black" app:layout_constraintBottom_toBottomOf="parent"</pre>

```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.097"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.188" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/sub"
        android:textAlignment="center"
        android:textSize="40dp"
        android:textColor="@color/red"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.058"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.278" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/pr"
        android:textAlignment="center"
        android:textSize="40dp"
        android:textColor="@color/blue"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.074"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.368" />

    <Spinner
        android:id="@+id/spinner"
        android:layout_width="411dp"
        android:layout_height="60dp"
        android:layout_marginTop="21dp"
        android:layout_marginEnd="1dp"
        android:entries="@array/subject"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

    <RadioButton
        android:id="@+id/radioButton2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="12dp"
```

```

        android:layout_marginEnd="328dp"
        android:text="BCA"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/spinner" />

<RadioButton
        android:id="@+id/radioButton1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="64dp"
        android:layout_marginEnd="324dp"
        android:text="MCA"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/spinner" />

<CheckBox
        android:id="@+id/checkBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="29dp"
        android:layout_marginEnd="112dp"
        android:text="FST"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/spinner" />

<CheckBox
        android:id="@+id/checkBox2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="100dp"
        android:layout_marginEnd="116dp"
        android:text="STA"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/spinner" />

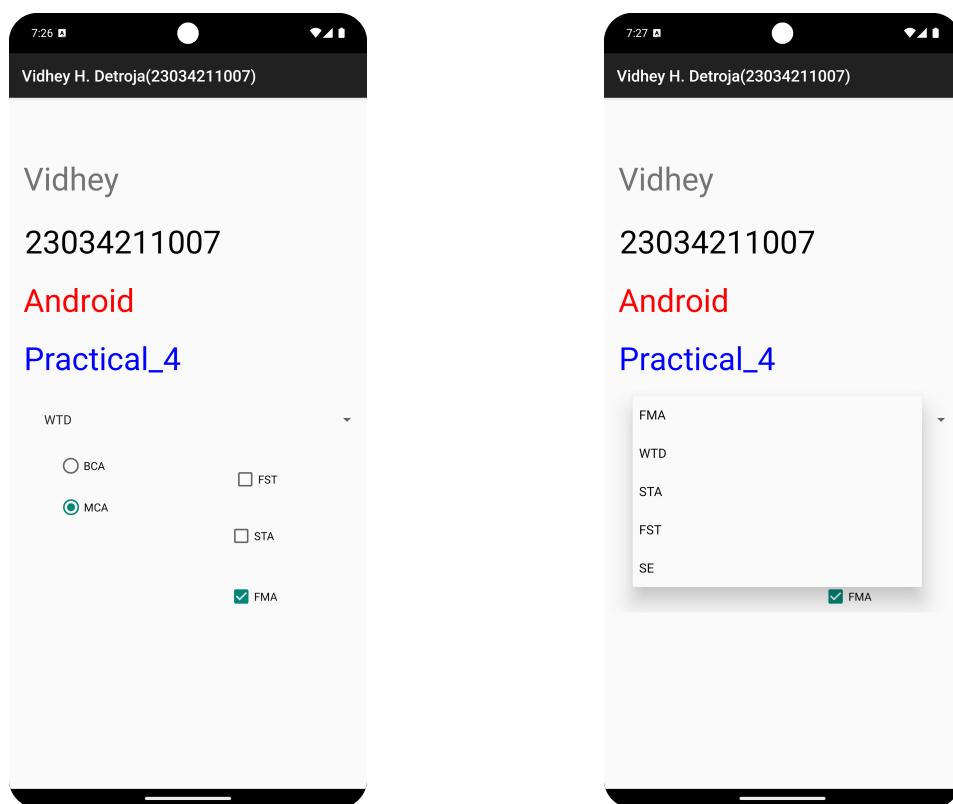
<CheckBox
        android:id="@+id/checkBox3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="176dp"
        android:layout_marginEnd="112dp"
        android:text="FMA"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/spinner" />

</androidx.constraintlayout.widget.ConstraintLayout>

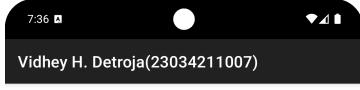
```

String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </pre>
------------	--

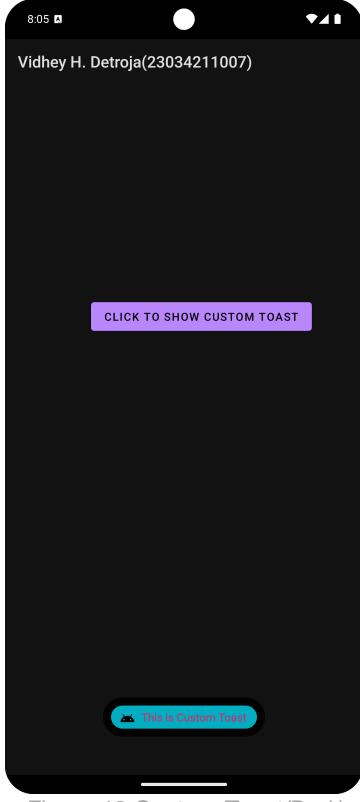
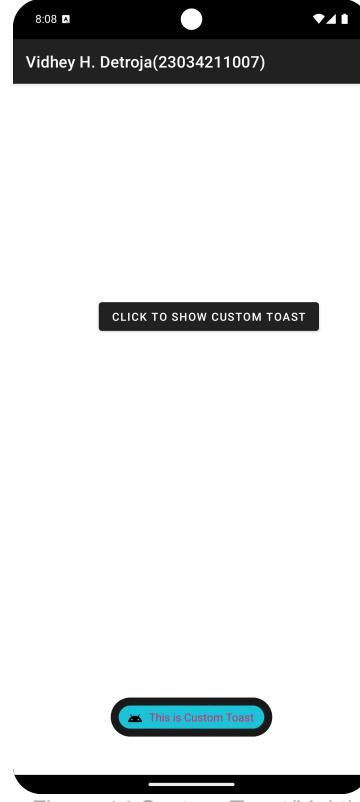
	<pre> <string name="pr">Practical_4</string> <string name="sub">Android</string> <string name="name">Vidhey</string> <string name="no">23034211007</string> <string-array name="subject"> <item>FMA</item> <item>WTD</item> <item>STA</item> <item>FST</item> <item>SE</item> </string-array> <dimen name="height">19dp</dimen> <dimen name="width">21dp</dimen> <bool name="BCA">false</bool> <bool name="MCA">true</bool> <bool name="FMA">false</bool> <bool name="WTD">false</bool> <bool name="STA">false</bool> <bool name="FST">false</bool> <bool name="SE">false</bool> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.Resources" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.Resources" parent="Base.Theme.Resources" /> </resources> </pre>
Color.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <resources> <color name="black">#FF000000</color> <color name="white">#FFFFFF</color> <color name="blue">#0000FF</color> <color name="red">#FF0000</color> <color name="green">#00FF00</color> </resources> </pre>



No. 5	Designing Simple Toast
MainActivity.java	<pre>package com.example.toast; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.view.View; import android.widget.Button; import android.widget.Toast; public class MainActivity extends AppCompatActivity { Button bt1; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); bt1 = findViewById(R.id.button); bt1.setOnClickListener(new View.OnClickListener() { @Override public void onClick(View v) { Toast.makeText(MainActivity.this, "It's Simple Toast", Toast.LENGTH_LONG).show(); } }); } }</pre>
Activity_main.xml	<pre><?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"> <Button android:id="@+id/button" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="256dp" android:layout_marginEnd="140dp" android:text="Simple Toast" app:layout_constraintEnd_toEndOf="parent" /></pre>

	<pre> app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout></pre>
String.xml	<pre><resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.Toast" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.Toast" parent="Base.Theme.Toast" /> </resources></pre>
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure 11 Simple Toast(Light)</p> </div> <div style="text-align: center;">  <p>Figure 12 Simple Toast(Dark)</p> </div> </div>

No. 6	Designing Custom Toast
MainActivity.java	<pre>package com.example.custom_toast; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.view.View; import android.widget.Button; import io.github.muddz.styleabletoast.StyleableToast; public class MainActivity extends AppCompatActivity { Button bt1; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); bt1 = findViewById(R.id.btn_custom_toast); bt1.setOnClickListener(new View.OnClickListener() { @Override public void onClick(View v) { StyleableToast.makeText(MainActivity.this, "This is Custom Toast", R.style.custom_toast).show(); } }); } }</pre>
Activity_main.xml	<pre><?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"> <Button android:id="@+id btn_custom_toast" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="268dp" android:layout_marginEnd="64dp" android:text="Click to Show Custom Toast" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout></pre>

String.xml	<pre><resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.Custom_Tost" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.Custom_Tost" parent="Base.Theme.Custom_Tost" /> <style name="custom_tost"> <item name="stTextColor">#E91E63</item> <item name="stColorBackground">#00BCD4</item> <item name="stIconStart">@drawable/ic_android_black_24dp</item> <item name="stStrokeColor">#000000</item> <item name="stStrokeWidth">10dp</item> </style> </resources></pre>
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure 13 Custom Toast(Dark)</p> </div> <div style="text-align: center;">  <p>Figure 14 Custom Toast(Light)</p> </div> </div>

No. 7	<h3 style="margin: 0;">Designing Dialog – Simple, Positive, Negative, Neutral</h3>
MainActivity.java	<pre style="font-family: monospace; margin: 0;">package com.example.dialogue; import androidx.appcompat.app.AlertDialog; import androidx.appcompat.app.AppCompatActivity; import android.content.DialogInterface; import android.os.Bundle; import android.view.View; import android.widget.Button; import android.widget.Toast; public class MainActivity extends AppCompatActivity { Button bt1, bt2; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); bt1 = findViewById(R.id.btnsmpl); bt2 = findViewById(R.id.btnalert); } public void alert(View view) { AlertDialog.Builder b1 = new AlertDialog.Builder(this); b1.setTitle("Permission Alert"); b1.setMessage("Do You Want to Grant Permission"); b1.setPositiveButton("Yes", new DialogInterface.OnClickListener() { @Override public void onClick(DialogInterface dialog, int which) { Toast.makeText(MainActivity.this, "Permission Allowed", Toast.LENGTH_LONG).show(); } }); b1.setNegativeButton("No", new DialogInterface.OnClickListener() { @Override public void onClick(DialogInterface dialog, int which) { Toast.makeText(MainActivity.this, "Permission Denied", Toast.LENGTH_LONG).show(); } }); b1.setNeutralButton("Close", new DialogInterface.OnClickListener() { @Override public void onClick(DialogInterface dialog, int which) { Toast.makeText(MainActivity.this, "Closed", Toast.LENGTH_LONG).show(); } }); } }</pre>

```

        }
    });
    AlertDialog dialog = b1.create();
    dialog.show();
}

public void simple(View view){
    AlertDialog.Builder builder = new AlertDialog.Builder(this);
    builder.setMessage("Do you Want to Allow");
    builder.setTitle("Permission Allowed");
    AlertDialog alertDialog = builder.create();
    alertDialog.show();
}
}

```

Activity_main.xml

```

<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">

    <Button
        android:id="@+id/btnsmpl"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="307dp"
        android:layout_marginEnd="159dp"
        android:text="Simple"
        android:onClick="simple"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/btnalert"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="44dp"
        android:layout_marginEnd="163dp"
        android:text="Alert"
        android:onClick="alert"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/btnsmpl" />

</androidx.constraintlayout.widget.ConstraintLayout>

```

String.xml

```

<resources>
    <string name="app_name">Vidhey H. Detroja(23034211007)</string>
</resources>

```

Theme.xml

```
<resources xmlns:tools="http://schemas.android.com/tools">
    <!-- Base application theme. -->
    <style name="Base.Theme.Dialogue"
        parent="Theme.MaterialComponents.DayNight.DarkActionBar">
        <!-- Customize your light theme here. -->
        <!-- <item name="colorPrimary">@color/my_light_primary</item> -->
    </style>

    <style name="Theme.Dialogue" parent="Base.Theme.Dialogue" />
</resources>
```

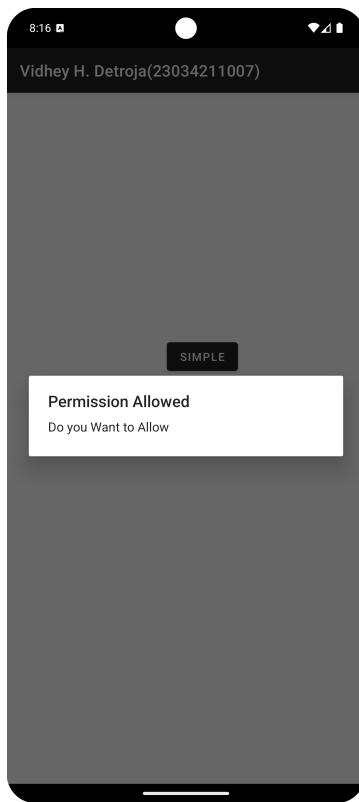


Figure 15 Simple Dialogbox

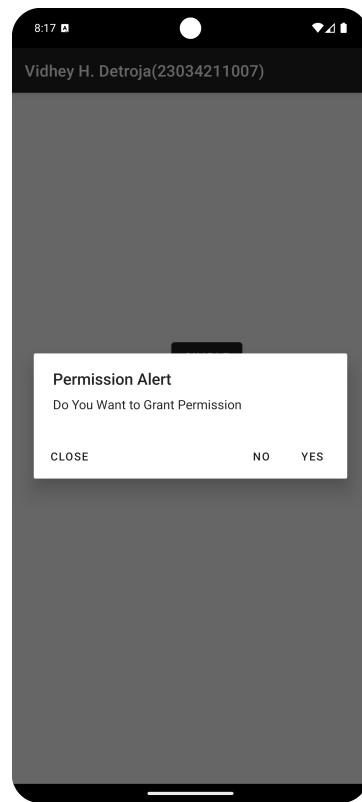


Figure 16 Alert Dialogbox with Positive, Negative, Neutral Button

No. 8	<h3>Navigation in Android Ex. Login Applications</h3>
MainActivity.java	<pre>package com.example.loginpage; import androidx.appcompat.app.AppCompatActivity; import android.content.Intent; import android.os.Bundle; import android.view.View; import android.widget.EditText; public class MainActivity extends AppCompatActivity { EditText ed1,ed2; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); ed1 = findViewById(R.id.ed1); ed2 = findViewById(R.id.ed2); } public void map(View view) { Intent i = new Intent(MainActivity.this, MainActivity2.class); i.putExtra("e",ed1.getText().toString()); i.putExtra("p",ed2.getText().toString()); startActivity(i); } }</pre>
MainActivity2.java	<pre>package com.example.loginpage; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.widget.EditText; public class MainActivity2 extends AppCompatActivity { @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main2); Bundle b = getIntent().getExtras(); b.getString("e"); b.getString("p"); EditText tv7 = findViewById(R.id.editTextText); tv7.setText(b.getString("e")); } }</pre>

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"
    android:background="@drawable/bg"
    tools:context=".MainActivity">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="@color/my_primary"
        android:alpha="0.7"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:gravity="center"
        android:layout_above="@+id/card_view"
        android:padding="28dp">

        <ImageView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:src="@drawable/location_icon"/>

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Vidhey's Login Page"
            android:textStyle="bold"
            android:fontFamily="sans-serif-medium"
            android:textSize="32sp"
            android:textColor="@color/white"/>

    </LinearLayout>

    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        app:cardCornerRadius="28dp"
        android:layout_marginBottom="-20dp"
        android:id="@+id/card_view"
        >

        <LinearLayout
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="#F8F8F8"
        android:orientation="vertical"
        android:padding="28dp">>

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Welcome"
            android:textColor="@color/my_primary"
            android:textSize="32sp"
            android:textStyle="bold" />

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:alpha="0.7"
            android:text="Please login with your information" />

        <View
            android:layout_width="wrap_content"
            android:layout_height="30dp" />

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:alpha="0.7"
            android:text="Email Address"
            android:textStyle="bold" />

        <EditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/ed1"
            android:hint="Email"
            android:drawableEnd="@drawable/done_icon"
            android:inputType="textEmailAddress" />

        <View
            android:layout_width="wrap_content"
            android:layout_height="20dp" />

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:alpha="0.7"
            android:text="Password"
            android:textStyle="bold" />
```

```
<EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/edi2"
    android:hint="password"
    android:drawableEnd="@drawable/password_icon"
    android:inputType="textPassword" />

<RelativeLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content">

    <CheckBox
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerVertical="true"
        android:alpha="0.7"
        android:text="Remember me" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_centerVertical="true"
        android:text="I forgot my password" />

    </RelativeLayout>

    <View
        android:layout_width="wrap_content"
        android:layout_height="10dp" />

    <com.google.android.material.button.MaterialButton
        android:layout_width="match_parent"
        android:layout_height="60dp"
        android:text="Login"
        android:onClick="map"
        app:cornerRadius="32dp" />

    <View
        android:layout_width="wrap_content"
        android:layout_height="10dp" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:alpha="0.7"
        android:text="Or Login with" />
```

```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:orientation="horizontal">

    <ImageView
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:layout_margin="12dp"
        android:background="@drawable/facebook" />

    <ImageView
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:layout_margin="12dp"
        android:background="@drawable/github" />

    <ImageView
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:layout_margin="12dp"
        android:background="@drawable/twitter" />

</LinearLayout>
</LinearLayout>
</androidx.cardview.widget.CardView>

</RelativeLayout>

```

```

Activity_main2.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=".MainActivity2">

    <EditText
        android:id="@+id/editTextText"
        android:layout_width="365dp"
        android:layout_height="80dp"
        android:layout_marginTop="216dp"
        android:layout_marginEnd="20dp"
        android:ems="10" />

```

	<pre> android:inputType="text" android:text="Name" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Theme.MyLogin" parent="Theme.MaterialComponents.DayNight.NoActionBar"> <!-- Primary brand color. --> <item name="colorPrimary">@color/my_primary</item> <item name="colorPrimaryVariant">@color/my_primary</item> <item name="colorOnPrimary">@color/white</item> <!-- Secondary brand color. --> <item name="colorSecondary">@color/my_secondary</item> <item name="colorSecondaryVariant">@color/my_secondary</item> <item name="colorOnSecondary">@color/black</item> <!-- Status bar color. --> <item name="android:statusBarColor">@color/my_primary</item> <!-- Customize your theme here. --> </style> </resources></pre>
Color.xml	<pre><?xml version="1.0" encoding="utf-8"?> <resources> <color name="purple_200">#FFBB86FC</color> <color name="purple_500">#FF6200EE</color> <color name="purple_700">#FF3700B3</color> <color name="teal_200">#FF03DAC5</color> <color name="teal_700">#FF018786</color> <color name="black">#FF000000</color> <color name="white">#FFFFFF</color> <color name="my_primary">#5E35B1</color> <color name="my_secondary">#673AB7</color> </resources></pre>

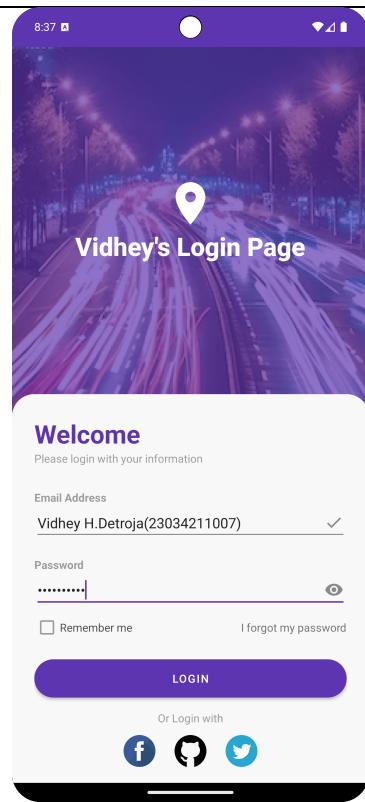


Figure 17 Login Page

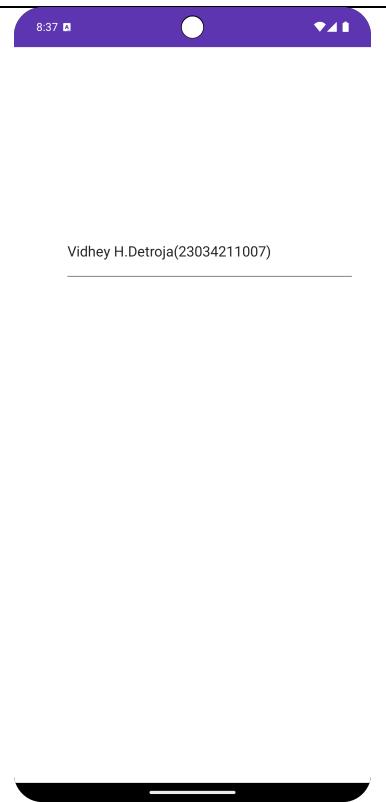


Figure 18 Data(username or email) transfer from 1st activity to 2nd activity

<p>No. 9</p>	<h3>Designing Simple Calculator Application</h3>
<p>MainActivity.java</p>	<pre>package com.example.calculatorbyvidhey; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.widget.Button; import android.widget.TextView; import java.util.ArrayList; public class MainActivity extends AppCompatActivity { Button b1,b2,b3,b4,b5,b6,b7,b8,b9,b0,b00,bplus,bminus,bmultiply,bdivide,bremainder,bequal,bbac kspace,bac,bdot; TextView tv; String operation; double firstNum; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); b1 = findViewById(R.id.num1); b2 = findViewById(R.id.num2); b3 = findViewById(R.id.num3); b4 = findViewById(R.id.num4); b5 = findViewById(R.id.num5); b6 = findViewById(R.id.num6); b7 = findViewById(R.id.num7); b8 = findViewById(R.id.num8); b9 = findViewById(R.id.num9); b0 = findViewById(R.id.zero); b00 = findViewById(R.id.dzero); bplus = findViewById(R.id.sum); bminus = findViewById(R.id.min); bmultiply = findViewById(R.id.multiply); bdivide = findViewById(R.id.div); bremainder = findViewById(R.id.rim); bequal = findViewById(R.id.equal); bbackspace = findViewById(R.id.backspace); bac = findViewById(R.id.AC); bdot = findViewById(R.id.point); tv = findViewById(R.id.screen); TextView screen = findViewById(R.id.screen); ArrayList<Button> nums = new ArrayList<>();</pre>

```
nums.add(b0);
nums.add(b1);
nums.add(b2);
nums.add(b3);
nums.add(b4);
nums.add(b5);
nums.add(b6);
nums.add(b7);
nums.add(b8);
nums.add(b9);

for (Button b : nums ){
    b.setOnClickListener(view -> {
        if(!screen.getText().toString().equals("0")){
            screen.setText(screen.getText().toString() + b.getText().toString());
        }
        else{
            screen.setText(b.getText().toString());
        }
    });
}

ArrayList<Button> opers = new ArrayList<>();
opers.add(bdivide);
opers.add(bminus);
opers.add(bmultiply);
opers.add(bplus);

for(Button b : opers){
    b.setOnClickListener(view -> {
        firstNum = Double.parseDouble(screen.getText().toString());
        operation = b.getText().toString();
        screen.setText("0");

    });
}

bbackspace.setOnClickListener(view ->{
    String num = screen.getText().toString();
    if (num.length()>1){
        screen.setText(num.substring(0,num.length()-1));
    } else if (num.length() == 1 && !num.equals("0")) {
        screen.setText("0");
    }

});

bequal.setOnClickListener(view -> {
    double secondNum = Double.parseDouble(screen.getText().toString());
    double result;
```

```
switch (operation){  
    case "/":  
        result = firstNum/secondNum;  
        break;  
    case "X":  
        result = firstNum*secondNum;  
        break;  
    case "+":  
        result = firstNum+secondNum;  
        break;  
    case "-":  
        result= firstNum-secondNum;  
        break;  
    default:  
        result= firstNum+secondNum;  
    }  
    screen.setText(String.valueOf(result));  
    firstNum=result;  
});  
}  
}
```

```
<?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"  
    android:background="#59B4C3"  
    android:textAlignment="center"  
    tools:context=".MainActivity">  
  
<TextView  
    android:id="@+id/screen"  
    android:layout_width="match_parent"  
    android:layout_height="246dp"  
    android:layout_marginStart="12dp"  
    android:layout_marginTop="12dp"  
    android:layout_marginEnd="12dp"  
    android:layout_marginBottom="12dp"  
    android:background="@drawable/textview"  
    android:paddingHorizontal="25dp"  
    android:paddingVertical="25dp"  
    android:text="0"  
    android:textAlignment="viewEnd"  
    android:textColor="#211C6A"  
    android:textSize="75dp"  
    android:textStyle="bold" />  
  
<LinearLayout
```

Activity_main.xml

```
    android:id="@+id/scrn"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:orientation="horizontal"
    android:paddingTop="20dp">>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_weight="1"
        android:orientation="vertical">
        <Button
            android:id="@+id/AC"
            android:text="ac"
            style="@style/Button2"/>

        <Button
            android:id="@+id/num7"
            android:text="7"
            style="@style/Button2"/>

        <Button
            android:id="@+id/num4"
            android:text="4"
            style="@style/Button2"/>

        <Button
            android:id="@+id/num1"
            android:text="1"
            style="@style/Button2"/>

        <Button
            android:id="@+id/point"
            android:text="."
            style="@style/Button2" />

    </LinearLayout>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_weight="1"
        android:orientation="vertical">
        <Button
            android:id="@+id/backspace"
            android:text="--"
            style="@style/Button2"/>

        <Button
            android:id="@+id/num8"
            android:text="8"
            style="@style/Button2"/>

    </LinearLayout>

```

```
        android:text="8"
        style="@style/Button2"/>

    <Button
        android:id="@+id/num5"
        android:text="5"
        style="@style/Button2"/>

    <Button
        android:id="@+id/num2"
        android:text="2"
        style="@style/Button2"/>

    <Button
        android:id="@+id/zero"
        android:text="0"
        style="@style/Button2"/>

</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_weight="1"
    android:orientation="vertical">
    <Button
        android:id="@+id/rim"
        android:text="%"
        style="@style/Button2"/>

    <Button
        android:id="@+id/num9"
        android:text="9"
        style="@style/Button2"/>

    <Button
        android:id="@+id/num6"
        android:text="6"
        style="@style/Button2"/>

    <Button
        android:id="@+id/num3"
        android:text="3"
        style="@style/Button2"/>

    <Button
        android:id="@+id/dzero"
        android:text="00"
        style="@style/Button2"/>

</LinearLayout>
```

```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_weight="1"
    android:orientation="vertical">
    <Button
        android:id="@+id/div"
        android:text="/"
        style="@style/Button2"/>

    <Button
        android:id="@+id/multiply"
        android:text "*"
        style="@style/Button2"/>

    <Button
        android:id="@+id/min"
        android:text "-"
        style="@style/Button2"/>

    <Button
        android:id="@+id/sum"
        android:text "+"
        style="@style/Button2"/>

    <Button
        android:id="@+id/equal"
        android:text "="
        style="@style/Button2"/>

    </LinearLayout>
</LinearLayout>
</RelativeLayout>

```

Theme.xml

```

<resources xmlns:tools="http://schemas.android.com/tools">
    <!-- Base application theme. -->
    <style name="Base.Theme.CalculatorByVidhey"
        parent="Theme.AppCompat.Light.NoActionBar">
        <!-- Customize your light theme here. -->
        <!-- <item name="colorPrimary">@color/my_light_primary</item> -->
    </style>

    <style name="Theme.CalculatorByVidhey" parent="Base.Theme.CalculatorByVidhey"
    />
    <style name="Button2">
        <item name="android:layout_width">75dp</item>
        <item name="android:layout_height">75dp</item>
        <item name="android:textStyle">bold</item>
    
```

	<pre> <item name="android:textSize">27dp</item> <item name="android:gravity">center</item> <item name="android:padding">10dp</item> <item name="android:layout_margin">10dp</item> <item name="android:background">@drawable/shape1</item> </style> </resources> </pre>
Textview.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <shape xmlns:android="http://schemas.android.com/apk/res/android" > <solid android:color="#F0F3FF" /> <padding android:left="10dp" android:right="10dp" android:bottom="1dp" android:top="10dp" /> <corners android:radius="13dp" /> </shape> </pre>
Shape.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <shape xmlns:android="http://schemas.android.com/apk/res/android" android:shape="rectangle"> <corners android:radius="13dp" /> <solid android:color="#74E291" /> <stroke android:color="#211C6A" android:width="5dp"/> <size android:width="100dp" android:height="100dp" /> </shape> </pre>

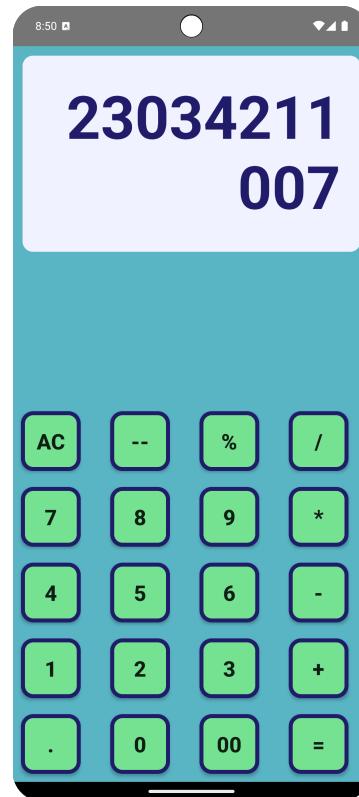


Figure 19 Working Calculator

<p>No. 10</p>	<h2>Designing User Interface based on Layouts</h2>
<p>MainActivity.java</p>	<pre>package com.example.authentication; import androidx.appcompat.app.AppCompatActivity; import android.content.Intent; import android.os.Bundle; import android.view.View; import android.widget.Button; import android.widget.TextView; import com.google.firebase.auth.FirebaseAuth; import com.google.firebase.auth.FirebaseUser; public class MainActivity extends AppCompatActivity { FirebaseAuth auth; Button button; TextView textView; FirebaseUser user; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); auth = FirebaseAuth.getInstance(); button = findViewById(R.id.logOut); textView = findViewById(R.id.user_details); user = auth.getCurrentUser(); if(user == null){ Intent intent = new Intent(getApplicationContext(), Login.class); startActivity(intent); finish(); } else { textView.setText(user.getEmail()); } button.setOnClickListener(new View.OnClickListener() { @Override public void onClick(View v) { FirebaseAuth.getInstance().signOut(); Intent intent = new Intent(getApplicationContext(), Login.class); startActivity(intent); finish(); } }); } }</pre>

	<pre> } } } </pre>
Login.java	<pre> package com.example.authentication; import androidx.annotation.NonNull; import androidx.appcompat.app.AppCompatActivity; import android.content.Intent; import android.os.Bundle; import android.text.TextUtils; import android.view.View; import android.widget.Button; import android.widget.ProgressBar; import android.widget.TextView; import android.widget.Toast; import com.google.android.gms.tasks.OnCompleteListener; import com.google.android.gms.tasks.Task; import com.google.android.material.textfield.TextInputEditText; import com.google.firebase.auth.AuthResult; import com.google.firebase.auth.FirebaseAuth; import com.google.firebase.auth.FirebaseUser; public class Login extends AppCompatActivity { TextInputEditText editTextEmail, editTextPassword; Button buttonlogin; FirebaseAuth mAuth; ProgressBar progressBar; TextView textView; @Override public void onStart() { super.onStart(); FirebaseUser currentUser = mAuth.getCurrentUser(); if(currentUser != null){ Intent intent = new Intent(getApplicationContext(), MainActivity.class); startActivity(intent); finish(); } } @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_login); mAuth = FirebaseAuth.getInstance(); editTextEmail = findViewById(R.id.email); editTextPassword = findViewById(R.id.password); buttonlogin = findViewById(R.id.btn2); } } </pre>

```
progressBar = findViewById(R.id.bar);
textView = findViewById(R.id.RegisterNow);
textView.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(getApplicationContext(), Register.class);
        startActivity(intent);
        finish();
    }
});

buttonlogin.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        progressBar.setVisibility(View.VISIBLE);
        String email, password;
        email = String.valueOf(editTextEmail.getText().toString());
        password = String.valueOf(editTextPassword.getText().toString());

        if(TextUtils.isEmpty(email)){
            Toast.makeText(Login.this, "Enter Email", Toast.LENGTH_SHORT).show();
            return;
        }

        if(TextUtils.isEmpty(password)){
            Toast.makeText(Login.this, "Enter Password",
Toast.LENGTH_SHORT).show();
            return;
        }

        mAuth.signInWithEmailAndPassword(email, password)
            .addOnCompleteListener(new OnCompleteListener<AuthResult>() {
                @Override
                public void onComplete(@NonNull Task<AuthResult> task) {
                    progressBar.setVisibility(View.GONE);
                    if (task.isSuccessful()) {
                        Toast.makeText(Login.this, "Login Successful",
Toast.LENGTH_SHORT).show();
                        Intent intent = new Intent(getApplicationContext(),
MainActivity.class);
                        startActivity(intent);
                        finish();
                    } else {
                        Toast.makeText(Login.this, "Authentication failed.",
Toast.LENGTH_SHORT).show();
                    }
                }
            });
    }
});
```

	<pre> } } } </pre>
Register.java	<pre> package com.example.authentication; import androidx.annotation.NonNull; import androidx.appcompat.app.AppCompatActivity; import android.content.Intent; import android.os.Bundle; import android.text.TextUtils; import android.util.Log; import android.view.View; import android.widget.Button; import android.widget.ProgressBar; import android.widget.TextView; import android.widget.Toast; import com.google.android.gms.tasks.OnCompleteListener; import com.google.android.gms.tasks.Task; import com.google.android.material.textfield.TextInputEditText; import com.google.firebase.auth.AuthResult; import com.google.firebase.auth.FirebaseAuth; import com.google.firebase.auth.FirebaseUser; public class Register extends AppCompatActivity { TextInputEditText editTextEmail, editTextPassword; Button buttonReg; FirebaseAuth mAuth; ProgressBar progressBar; TextView textView; @Override public void onStart() { super.onStart(); FirebaseUser currentUser = mAuth.getCurrentUser(); if(currentUser != null){ Intent intent = new Intent(getApplicationContext(), MainActivity.class); startActivity(intent); finish(); } } @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_register); mAuth = FirebaseAuth.getInstance(); editTextEmail = findViewById(R.id.email); editTextPassword = findViewById(R.id.password); } } </pre>

```
buttonReg = findViewById(R.id.btn1);
progressBar = findViewById(R.id.bar);
textView = findViewById(R.id.LoginNow);
textView.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(getApplicationContext(), Login.class);
        startActivity(intent);
        finish();
    }
});

buttonReg.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        progressBar.setVisibility(View.VISIBLE);
        String email, password;
        email = String.valueOf(editTextEmail.getText().toString());
        password = String.valueOf(editTextPassword.getText().toString());

        if(TextUtils.isEmpty(email)){
            Toast.makeText(Register.this, "Enter Email", Toast.LENGTH_SHORT).show();
            return;
        }

        if(TextUtils.isEmpty(password)){
            Toast.makeText(Register.this, "Enter Password",
Toast.LENGTH_SHORT).show();
            return;
        }

        mAuth.signInWithEmailAndPassword(email, password)
            .addOnCompleteListener(new OnCompleteListener<AuthResult>() {
                @Override
                public void onComplete(@NonNull Task<AuthResult> task) {
                    progressBar.setVisibility(View.GONE);
                    if (task.isSuccessful()) {
                        Toast.makeText(Register.this, "Account Created:",
Toast.LENGTH_SHORT).show();
                        Intent intent = new Intent(getApplicationContext(), Login.class);
                        startActivity(intent);
                        finish();

                    } else {
                        Toast.makeText(Register.this, "Authentication failed :(",
Toast.LENGTH_SHORT).show();
                    }
                }
            });
    }
});
```

	<pre> }); } } </pre>
Activity_main.xml	<pre> <?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:gravity="center" tools:context=".MainActivity"> <TextView android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="Hello World!" android:id="@+id/user_details" /> <Button android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="@string/log_out" android:id="@+id/logOut" ></Button> </LinearLayout> </pre>
Activity_login.xml	<pre> <?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:gravity="center" tools:context=".Login" > <TextView android:layout_width="match_parent" android:layout_height="wrap_content" android:text="@string/login" android:gravity="center" android:layout_marginBottom="10dp" android:textStyle="bold" android:textColor="@color/black" android:textSize="35dp" /> </pre>

```
        android:fontFamily="cursive"
    ></TextView>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
    >

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/email"
            android:hint="@string/email"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginRight="10dp"
            android:layout_marginLeft="10dp"
            android:gravity="center"
        ></com.google.android.material.textfield.TextInputEditText>
    </com.google.android.material.textfield.TextInputLayout>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
    >

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/password"
            android:hint="@string/password"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginRight="10dp"
            android:layout_marginLeft="10dp"
            android:layout_marginTop="5dp"
            android:gravity="center"
        ></com.google.android.material.textfield.TextInputEditText>
    </com.google.android.material.textfield.TextInputLayout>

    <ProgressBar
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/bar"
        android:visibility="gone"
    ></ProgressBar>

    <Button
        android:id="@+id	btn2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="@string/login"
```

```
></Button>

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="50dp"
    android:textStyle="bold"
    android:textColor="@color/black"
    android:textSize="15sp"
    android:id="@+id/RegisterNow"
    android:text="@string/click_to_register"
    ></TextView>
</LinearLayout>
```

```
<?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:gravity="center"
    tools:context=".Register"
    >

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="@string/register"
        android:gravity="center"
        android:layout_marginBottom="10dp"
        android:textStyle="bold"
        android:textColor="@color/black"
        android:textSize="35dp"
        android:fontFamily="cursive"
        ></TextView>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        >

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/email"
            android:hint="@string/email"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginRight="10dp"
            android:layout_marginLeft="10dp"
            >
```

```
        android:gravity="center"
    ></com.google.android.material.textfield.TextInputEditText>
</com.google.android.material.textfield.TextInputLayout>

<com.google.android.material.textfield.TextInputLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    >

    <com.google.android.material.textfield.TextInputEditText
        android:id="@+id/password"
        android:hint="@string/password"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginRight="10dp"
        android:layout_marginLeft="10dp"
        android:layout_marginTop="5dp"
        android:gravity="center"
    ></com.google.android.material.textfield.TextInputEditText>

</com.google.android.material.textfield.TextInputLayout>

<ProgressBar
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/bar"
    android:visibility="gone"
    ></ProgressBar>

<Button
    android:id="@+id/btn1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:text="@string/register"
    ></Button>

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="50dp"
    android:textStyle="bold"
    android:textColor="@color/black"
    android:textSize="15sp"
    android:id="@+id/LoginNow"
    android:text="@string/click_to_login"
    ></TextView>
</LinearLayout>
```

String.xml	<pre><resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> <string name="login">Login</string> <string name="email">Email</string> <string name="password">Password</string> <string name="register">Register</string> <string name="click_to_login">Click To Login</string> <string name="click_to_register">Click To Register</string> <string name="log_out">Log Out</string> </resources></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.Authentication" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> <!-- Primary brand color. --> <item name="colorPrimary">@color/purple_500</item> <item name="colorPrimaryVariant">@color/purple_700</item> <item name="colorOnPrimary">@color/white</item> <!-- Secondary brand color. --> <item name="colorSecondary">@color/teal_200</item> <item name="colorSecondaryVariant">@color/teal_700</item> <item name="colorOnSecondary">@color/black</item> <!-- Status bar color. --> <item name="android:statusBarColor">?attr/colorPrimaryVariant</item> <!-- Customize your theme here. --> </style> <style name="Theme.Authentication" parent="Base.Theme.Authentication" /> </resources></pre>
Color.xml	<pre><?xml version="1.0" encoding="utf-8"?> <resources> <color name="purple_200">#FFBB86FC</color> <color name="purple_500">#FF6200EE</color> <color name="purple_700">#FF3700B3</color> <color name="teal_200">#FF03DAC5</color> <color name="teal_700">#FF018786</color> <color name="black">#FF000000</color> <color name="white">#FFFFFF</color> </resources></pre>

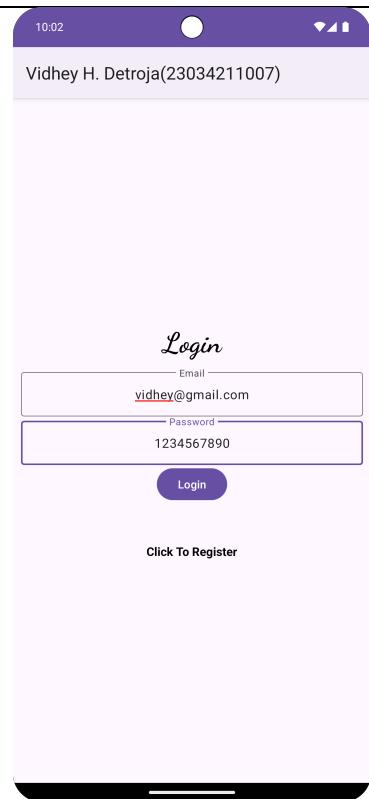


Figure 20 Login Activity

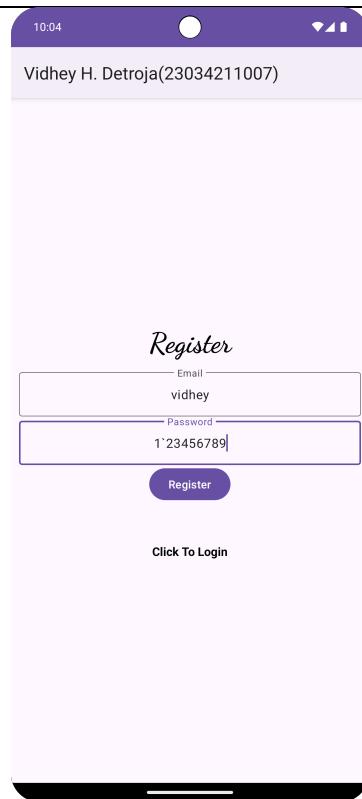


Figure 21 Register Activity

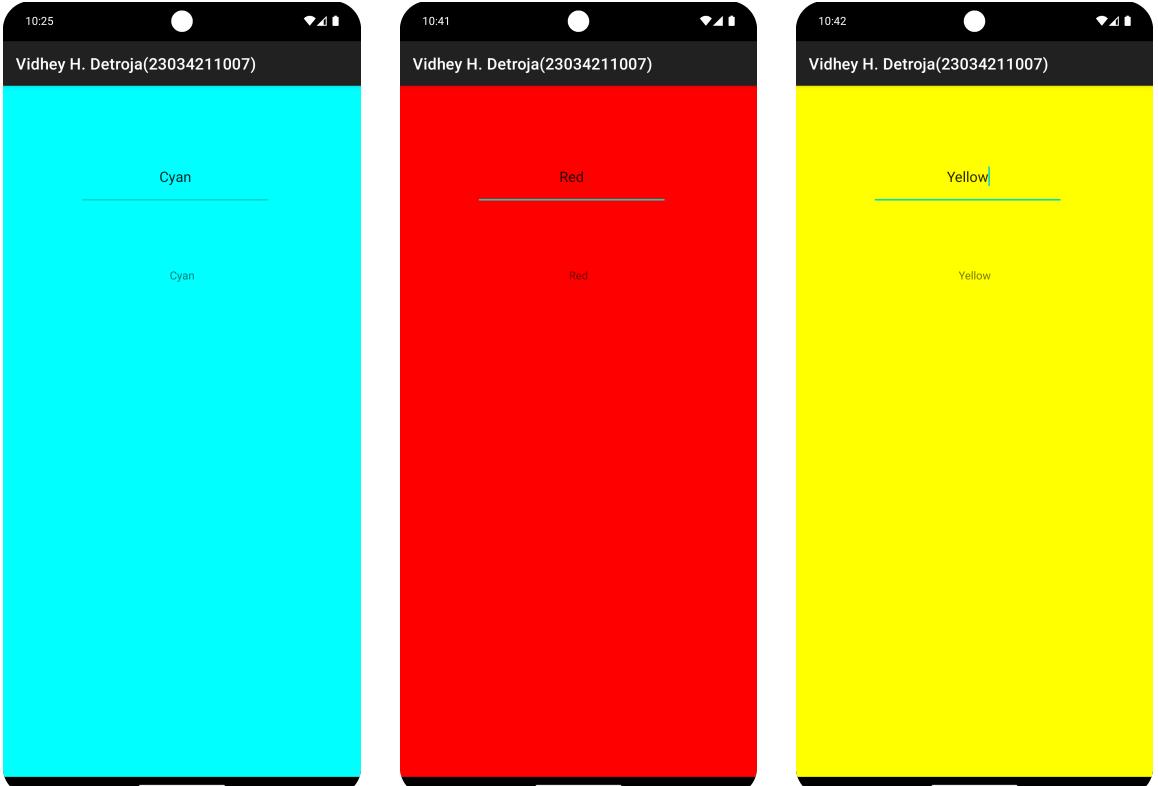
<p>No. 11</p>	<h3>Applying colors on Activity background (AutoCompleteTextView)</h3>
<p>MainActivity.java</p>	<pre>package com.example.autocompleteview; import androidx.appcompat.app.AppCompatActivity; import androidx.constraintlayout.widget.ConstraintLayout; import android.graphics.Color; import android.os.Bundle; import android.view.View; import android.widget.AdapterView; import android.widget.ArrayAdapter; import android.widget.AutoCompleteTextView; import android.widget.TextView; public class MainActivity extends AppCompatActivity { ConstraintLayout ll; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); ll=(ConstraintLayout) findViewById(R.id.tl); String colors[] = {"Red", "Cyan", "Yellow","White"}; ArrayAdapter<String> adapter = new ArrayAdapter<String> (this, android.R.layout.simple_dropdown_item_1line, colors); AutoCompleteTextView act = (AutoCompleteTextView) findViewById(R.id.aCTVI); act.setAdapter(adapter); act.setOnItemClickListener (new AdapterView.OnItemClickListener() { TextView tv = (TextView) findViewById(R.id. tvI); @Override public void onItemClick(AdapterView<?>parent, View view, int position, long rowid) { // tv.setText(parent.getItemAtPosition(position).toString()); tv.setText(act.getText().toString()); String c=parent.getItemAtPosition(position).toString(); if(c.equals("Red")) { ll.setBackgroundColor(Color.RED); } else if(c.equals("Cyan")) { ll.setBackgroundColor(Color.CYAN); } else if(c.equals("Yellow")) { ll.setBackgroundColor(Color.YELLOW); } } }); } }</pre>

```
        else if(c.equals("White"))
        {
            ll.setBackgroundColor(Color.WHITE);
        }
    });
}
}

<?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:id="@+id/t1"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="0dp"
    tools:layout_editor_absoluteY="107dp">

    <TextView
        android:id="@+id/tv1"
        android:layout_width="149dp"
        android:layout_height="62dp"
        android:layout_marginBottom="500dp"
        android:hint="AutoCompleteView"
        android:textAlignment="center"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/aCTV1" />

    <AutoCompleteTextView
        android:id="@+id/aCTV1"
        android:layout_width="241dp"
        android:layout_height="74dp"
        android:layout_marginStart="108dp"
        android:layout_marginEnd="150dp"
        android:completionThreshold="1"
        android:hint="This is AutoComplete"
        android:textAlignment="center"
        app:layout_constraintBottom_toTopOf="@+id/tv1"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.261"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.0" />
```

	</androidx.constraintlayout.widget.ConstraintLayout>
String.xml	<pre><resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.AutoCompleteView" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.AutoCompleteView" parent="Base.Theme.AutoCompleteView" /> </resources></pre>
	 <p>The figure consists of three side-by-side screenshots of a mobile application. Each screenshot shows a black header bar with the text "Vidhey H. Detroja(23034211007)". Below the header is a horizontal red line. The main content area has a different color: the left one is cyan, the middle one is red, and the right one is yellow. In the bottom right corner of each screenshot, there is some small, illegible text.</p> <p>Figure 22 Set Cyan Color to BackGround using AutoCompleteView</p> <p>Figure 23 Set Red Color to BackGround using AutoCompleteView</p> <p>Figure 24 Set YellowColor to BackGround using AutoCompleteView</p>

<p>No. 12</p>	<h3 style="text-align: center;">Applying colors on Activity background (MultiAutoCompleteTextView)</h3>
<p>MainActivity.java</p>	<pre> package com.example.multiautocompleteview; import androidx.appcompat.app.AppCompatActivity; import androidx.constraintlayout.widget.ConstraintLayout; import android.graphics.Color; import android.os.Bundle; import android.view.View; import android.widget.AdapterView; import android.widget.ArrayAdapter; import android.widget.MultiAutoCompleteTextView; import android.widget.TextView; </pre> <pre> public class MainActivity extends AppCompatActivity { ConstraintLayout ll; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); ll=(ConstraintLayout) findViewById(R.id.tl); String colors[] = {"Red", "Cyan", "Yellow","White"}; ArrayAdapter<String> adapter1 = new ArrayAdapter<String> (this, android.R.layout.simple_dropdown_item_1line, colors); MultiAutoCompleteTextView mact = findViewById(R.id.aCTV2); mact.setAdapter(adapter1); mact.setTokenizer(new MultiAutoCompleteTextView.CommaTokenizer()); mact.setOnItemClickListener (new AdapterView.OnItemClickListener() { TextView tvv = (TextView) findViewById(R.id.tv2); @Override public void onItemClick(AdapterView<?>parent, View view, int position, long rowid) { tvv.setText(mact.getText().toString()); // tvv.setText(parent.getItemAtPosition(position).toString()); String c=parent.getItemAtPosition(position).toString(); if(c.equals("Red")) { ll.setBackgroundColor(Color.RED); } else if(c.equals("Cyan")) { ll.setBackgroundColor(Color.CYAN); } else if(c.equals("Yellow")) { ll.setBackgroundColor(Color.YELLOW); } } }); } } </pre>

```

        }
        else if(c.equals("White"))
        {
            11.setBackgroundColor(Color.WHITE);
        }

    });
}
}

```

Activity.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:id="@+id/t1"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="0dp"
    tools:layout_editor_absoluteY="107dp">

    <MultiAutoCompleteTextView
        android:id="@+id/aCTV2"
        android:layout_width="244dp"
        android:layout_height="65dp"
        android:layout_marginTop="124dp"
        android:completionThreshold="1"
        android:hint="This is MultiAutoComplete"
        android:textAlignment="center"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/tv2"
        android:layout_width="138dp"
        android:layout_height="62dp"
        android:layout_marginTop="148dp"
        android:hint="MultiAutoComplete"
        android:textAlignment="center"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/aCTV2" />

</androidx.constraintlayout.widget.ConstraintLayout>

```

String.xml	<pre><resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources></pre>
Theme.xml	<pre><resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.MultiAutoCompleteView" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.MultiAutoCompleteView" parent="Base.Theme.MultiAutoCompleteView" /> </resources></pre>
	<p>The image contains three side-by-side screenshots of an Android mobile application interface. Each screenshot shows a black header bar with the text "Vidhey H. Detroja(23034211007)". Below the header is a white input field containing the placeholder text "Yellow, Cyan, Red," followed by a light blue underline. The background of each screen is a solid color: yellow in the first, cyan in the second, and red in the third. The time at the top of each screen is 11:03, 11:04, and 11:04 respectively.</p> <p>Figure 25 Set Yellow Color to BackGround using MultiAutoCompleteView</p> <p>Figure 26 Set Cyan Color to BackGround using MultiAutoCompleteView</p> <p>Figure 27 Set Red Color to BackGround using MultiAutoCompleteView</p>

<p>No. 13</p>	<h3 style="text-align: center;">Applying colors on Activity background (Spinner)</h3>
<p>MainActivity.java</p>	<pre> package com.example.spinner; import androidx.appcompat.app.AppCompatActivity; import androidx.constraintlayout.widget.ConstraintLayout; import android.graphics.Color; import android.os.Bundle; import android.view.View; import android.widget.AdapterView; import android.widget.Spinner; import android.widget.TextView; public class MainActivity extends AppCompatActivity { ConstraintLayout ll; Spinner sp; TextView tv; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); sp = findViewById(R.id.spinner2); sp.setSelection(1); tv = findViewById(R.id.tv1); ll=(ConstraintLayout) findViewById(R.id.tl); String colors[] = {"Red", "Cyan", "Yellow", "White"}; sp.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() { @Override public void onItemSelected(AdapterView<?> parent, View view, int position, long id) { tv.setText(parent.getItemAtPosition(position).toString()); String c=parent.getItemAtPosition(position).toString(); if(c.equals("Red")) { ll.setBackgroundColor(Color.RED); } else if(c.equals("Cyan")) { ll.setBackgroundColor(Color.CYAN); } else if(c.equals("Yellow")) { ll.setBackgroundColor(Color.YELLOW); } else if(c.equals("White")) { ll.setBackgroundColor(Color.WHITE); } } }); } } </pre>

	<pre> } } @Override public void onNothingSelected(AdapterView<?> parent) { ... } } </pre>
Activity.xml	<pre> <?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:id="@+id/t1" android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".MainActivity"> <TextView android:id="@+id/tv1" android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="Hello World!" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" /> <Spinner android:id="@+id/spinner2" android:layout_width="409dp" android:layout_height="wrap_content" android:entries="@array/aStudents" tools:layout_editor_absoluteX="1dp" tools:layout_editor_absoluteY="16dp" /> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.Spinner" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> </pre>

```
<!-- <item name="colorPrimary">@color/my_light_primary</item> -->  
</style>  
  
<style name="Theme.Spinner" parent="Base.Theme.Spinner" />  
</resources>
```

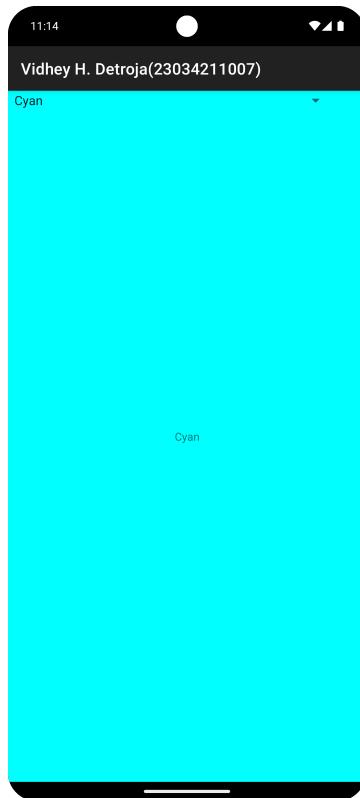


Figure 28 Set Cyan Color to BackGround using Spinner

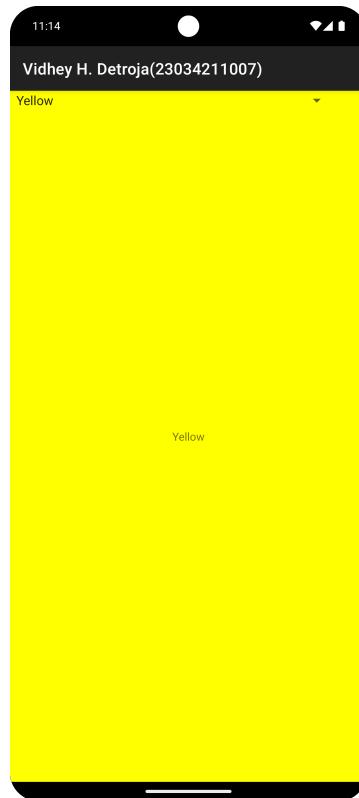


Figure 29 Set Yellow Color to BackGround using Spinner

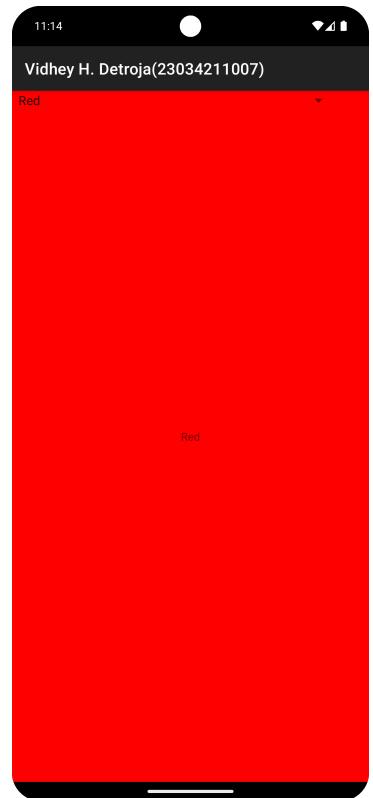


Figure 30 Set Red Color to BackGround using Spinner

<p>No. 14</p>	<h3>Design “ABCD” using Scroll view. (Adapter)</h3>
<p>MainActivity.java</p>	<pre>package com.example.abcd_scroll; import androidx.appcompat.app.AppCompatActivity; import android.media.MediaPlayer; import android.os.Bundle; import android.view.View; import java.util.HashMap; import java.util.Map; public class MainActivity extends AppCompatActivity { private Map<Character, MediaPlayer> mediaPlayers; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); mediaPlayers = new HashMap<>(); int[] soundResources = { R.raw.aaa, R.raw.bbb, R.raw.ccc, R.raw.ddd, R.raw.eee, R.raw.fff, R.raw.ggg, R.raw.hhh, R.raw.iii, R.raw.jjj, R.raw.kkk, R.raw.lll, R.raw.mmm, R.raw.nnn, R.raw.ooo, R.raw.ppp, R.raw.qqq, R.raw.rrr, R.raw.sss, R.raw.ttt, R.raw.uuu, R.raw.vvv, R.raw.www, R.raw.fff, R.raw.yyy, R.raw.zzz }; char[] letters = "abcdefghijklmnopqrstuvwxyz".toCharArray(); for (int i = 0; i < letters.length; i++) { mediaPlayers.put(letters[i], MediaPlayer.create(this, soundResources[i])); } for (char letter : letters) { int buttonId = getResources().getIdentifier("button" + letter, "id", getPackageName()); View button = findViewById(buttonId); button.setTag(letter); button.setOnClickListener(this::playAudio); } } public void playAudio(View view) { char letter = (char) view.getTag(); MediaPlayer player = mediaPlayers.get(letter); if (player != null) { player.start(); } } @Override protected void onDestroy() { super.onDestroy(); for (MediaPlayer player : mediaPlayers.values()) { if (player != null) { </pre>

	player.release(); } }
Activity.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"> <ScrollView android:layout_width="match_parent" android:layout_height="match_parent" android:background="@color/white"> <LinearLayout android:layout_width="match_parent" android:layout_height="wrap_content" android:orientation="vertical"> <ImageView android:onClick="audio_a" android:layout_width="match_parent" android:layout_height="wrap_content" android:layout_marginTop="40dp" android:id="@+id/Letter_A" app:srcCompat="@drawable/a"> </ImageView> <ImageView android:onClick="audio_b" android:layout_width="match_parent" android:layout_height="wrap_content" android:layout_marginTop="40dp" android:id="@+id/Letter_B" app:srcCompat="@drawable/b"> </ImageView> <ImageView android:onClick="audio_c" android:layout_width="match_parent" android:layout_height="wrap_content" android:layout_marginTop="40dp" android:id="@+id/Letter_C" app:srcCompat="@drawable/c"> </LinearLayout> </ScrollView> </androidx.constraintlayout.widget.ConstraintLayout>

```
</ImageView>

<ImageView
    android:onClick="audio_d"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_D"
    app:srcCompat="@drawable/d">
</ImageView>

<ImageView
    android:onClick="audio_e"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_E"
    app:srcCompat="@drawable/e">
</ImageView>

<ImageView
    android:onClick="audio_f"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_F"
    app:srcCompat="@drawable/f">
</ImageView>

<ImageView
    android:onClick="audio_g"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_G"
    app:srcCompat="@drawable/g">
</ImageView>

<ImageView
    android:onClick="audio_h"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_H"
    app:srcCompat="@drawable/h">
</ImageView>

<ImageView
    android:onClick="audio_i"
    android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_I"
        app:srcCompat="@drawable/i">
    </ImageView>

    <ImageView
        android:onClick="audio_j"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_J"
        app:srcCompat="@drawable/j">
    </ImageView>

    <ImageView
        android:onClick="audio_k"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_K"
        app:srcCompat="@drawable/k">
    </ImageView>

    <ImageView
        android:onClick="audio_l"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_L"
        app:srcCompat="@drawable/l">
    </ImageView>

    <ImageView
        android:onClick="audio_m"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_M"
        app:srcCompat="@drawable/m">
    </ImageView>

    <ImageView
        android:onClick="audio_n"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_N"
        app:srcCompat="@drawable/n">
    </ImageView>
```

```
<ImageView
    android:onClick="audio_o"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_O"
    app:srcCompat="@drawable/o">
</ImageView>

<ImageView
    android:onClick="audio_p"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_P"
    app:srcCompat="@drawable/p">
</ImageView>

<ImageView
    android:onClick="audio_q"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_Q"
    app:srcCompat="@drawable/q">
</ImageView>

<ImageView
    android:onClick="audio_r"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_R"
    app:srcCompat="@drawable/r">
</ImageView>

<ImageView
    android:onClick="audio_s"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_S"
    app:srcCompat="@drawable/s">
</ImageView>

<ImageView
    android:onClick="audio_t"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
```

```
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_T"
        app:srcCompat="@drawable/t">
    </ImageView>

    <ImageView
        android:onClick="audio_u"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_U"
        app:srcCompat="@drawable/u">
    </ImageView>

    <ImageView
        android:onClick="audio_v"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_V"
        app:srcCompat="@drawable/v">
    </ImageView>

    <ImageView
        android:onClick="audio_w"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_W"
        app:srcCompat="@drawable/w">
    </ImageView>

    <ImageView
        android:onClick="audio_x"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_X"
        app:srcCompat="@drawable/x">
    </ImageView>

    <ImageView
        android:onClick="audio_y"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_Y"
        app:srcCompat="@drawable/y">
    </ImageView>
    <ImageView
```

	<pre> android:onClick="audio_z" android:layout_width="match_parent" android:layout_height="wrap_content" android:layout_marginTop="40dp" android:id="@+id/Letter_Z" app:srcCompat="@drawable/z"> </ImageView> </LinearLayout> </ScrollView> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.ABCD_Scroll" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.ABCD_Scroll" parent="Base.Theme.ABCD_Scroll" /> </resources> </pre>
	 <p>Figure 31 Scrolling a-z by using ScrollView</p>

No. 15	Design “Country & its flag” using Pictures controls.
MainActivity.java	<pre> package com.example.flag; import androidx.appcompat.app.AppCompatActivity; import android.media.MediaPlayer; import android.os.Bundle; import android.view.View; public class MainActivity extends AppCompatActivity { MediaPlayer a,b,c,d,e,f,g,h,i,j,k; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); a=MediaPlayer.create(MainActivity.this,R.raw.argentina); b=MediaPlayer.create(MainActivity.this,R.raw.brazil); c=MediaPlayer.create(MainActivity.this,R.raw.canada); d=MediaPlayer.create(MainActivity.this,R.raw.india); e=MediaPlayer.create(MainActivity.this,R.raw.israel); f=MediaPlayer.create(MainActivity.this,R.raw.japan); g=MediaPlayer.create(MainActivity.this,R.raw.netherland); h=MediaPlayer.create(MainActivity.this,R.raw.niger); i=MediaPlayer.create(MainActivity.this,R.raw.newzealand); j=MediaPlayer.create(MainActivity.this,R.raw.puerto20rico); k=MediaPlayer.create(MainActivity.this,R.raw.korea); } public void audio_a(View view) {a.start();} public void audio_b(View view) { b.start(); } public void audio_c(View view) { c.start(); } public void audio_d(View view) { d.start(); } public void audio_e(View view) { e.start(); } public void audio_f(View view) { f.start(); } public void audio_g(View view) { g.start(); } public void audio_h(View view) { h.start(); } public void audio_i(View view) { i.start(); } public void audio_j(View view) { j.start(); } public void audio_k(View view) { k.start(); } } </pre>
Activity.xml	<pre> <?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" </pre>

```
tools:context=".MainActivity"

<ScrollView
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@color/white">

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

        <ImageView
            android:onClick="audio_a"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="40dp"
            android:id="@+id/Letter_A"
            app:srcCompat="@drawable/argentina">
        </ImageView>

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Argentina"
            android:layout_gravity="center"/>

        <ImageView
            android:onClick="audio_b"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="40dp"
            android:id="@+id/Letter_B"
            app:srcCompat="@drawable/brazil">
        </ImageView>

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Brazil"
            android:layout_gravity="center"/>

        <ImageView
            android:onClick="audio_c"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="40dp"
            android:id="@+id/Letter_C"
            app:srcCompat="@drawable/canada">
        </ImageView>
```

```
<TextView  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Canada"  
    android:layout_gravity="center"/>  
  
<ImageView  
    android:onClick="audio_d"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="40dp"  
    android:id="@+id/Letter_D"  
    app:srcCompat="@drawable/india">  
</ImageView>  
  
<TextView  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="India"  
    android:layout_gravity="center"/>  
  
<ImageView  
    android:onClick="audio_e"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="40dp"  
    android:id="@+id/Letter_E"  
    app:srcCompat="@drawable/iseral">  
</ImageView>  
  
<TextView  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Israel"  
    android:layout_gravity="center"/>  
  
<ImageView  
    android:onClick="audio_f"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="40dp"  
    android:id="@+id/Letter_F"  
    app:srcCompat="@drawable/japan">  
</ImageView>  
  
<TextView  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Japan"
```

```
        android:layout_gravity="center"/>

<ImageView
    android:onClick="audio_g"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_G"
    app:srcCompat="@drawable/netharland">
</ImageView>

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Netherland"
    android:layout_gravity="center"/>

<ImageView
    android:onClick="audio_h"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_H"
    app:srcCompat="@drawable/niger">
</ImageView>

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Niger"
    android:layout_gravity="center"/>

<ImageView
    android:onClick="audio_i"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="40dp"
    android:id="@+id/Letter_I"
    app:srcCompat="@drawable/nz">
</ImageView>

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="New Zeland"
    android:layout_gravity="center"/>

<ImageView
    android:onClick="audio_j"
    android:layout_width="match_parent"
```

```

        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_J"
        app:srcCompat="@drawable/puerto_rico">
    </ImageView>

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Puerto Rico"
        android:layout_gravity="center"/>

    <ImageView
        android:onClick="audio_k"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:id="@+id/Letter_K"
        app:srcCompat="@drawable/sk">
    </ImageView>

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Korea"
        android:layout_gravity="center"/>

</LinearLayout>

</ScrollView>

</androidx.constraintlayout.widget.ConstraintLayout>

```

String.xml

```

<resources>
    <string name="app_name">Vidhey H. Detroja(23034211007)</string>
</resources>

```

Theme.xml

```

<resources xmlns:tools="http://schemas.android.com/tools">
    <!-- Base application theme. -->
    <style name="Base.Theme.Flag"
        parent="Theme.AppCompat.DayNight.DarkActionBar">
        <!-- Customize your light theme here. -->
        <!-- <item name="colorPrimary">@color/my_light_primary</item> -->
    </style>

    <style name="Theme.Flag" parent="Base.Theme.Flag" />
</resources>

```

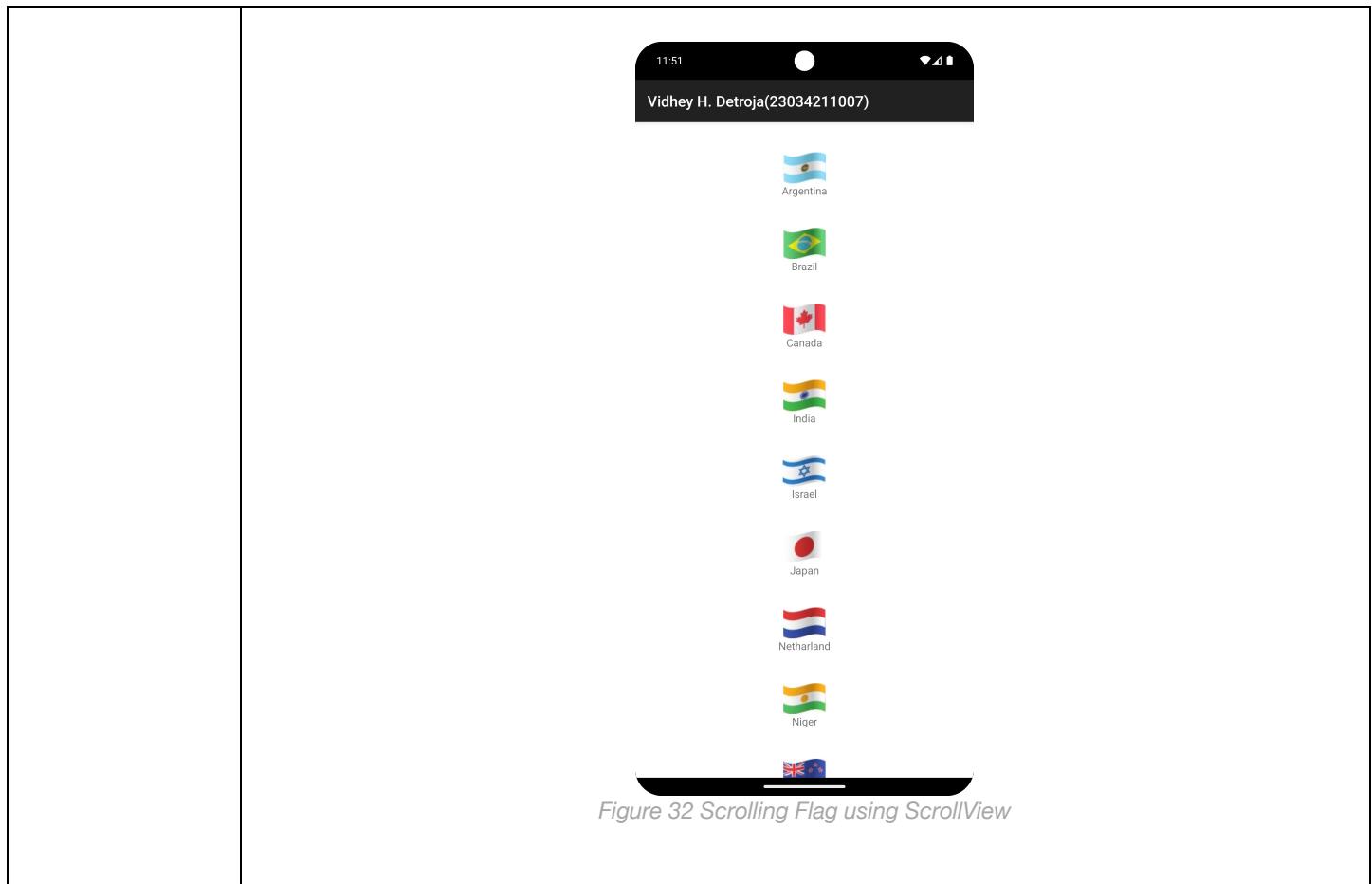
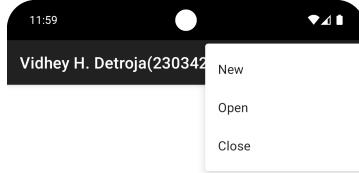


Figure 32 Scrolling Flag using ScrollView

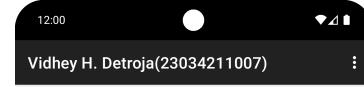
<p>No. 16</p>	<p align="center">Designing Option menu.</p>
<p>MainActivity.java</p>	<pre>package com.example.optionmenu; import androidx.annotation.NonNull; import androidx.appcompat.app.AppCompatActivity; import android.annotation.SuppressLint; import android.os.Bundle; import android.view.Menu; import android.view.MenuInflater; import android.view.MenuItem; import android.widget.Toast; public class MainActivity extends AppCompatActivity { MenuInflater opMenu; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); opMenu = getMenuInflater(); } @Override public boolean onCreateOptionsMenu(Menu menu) { opMenu.inflate(R.menu.option_menu,menu); return super.onCreateOptionsMenu(menu); } @SuppressLint("NonConstantResourceId") @Override public boolean onOptionsItemSelected(@NonNull MenuItem item) { int itemId = item.getItemId(); if (itemId == R.id.btnAdd) { Toast.makeText(this, "New", Toast.LENGTH_LONG).show(); } else if (itemId == R.id.btnOpen) { Toast.makeText(this, "Open", Toast.LENGTH_LONG).show(); } else if (itemId == R.id.btnClose) { Toast.makeText(this, "Close", Toast.LENGTH_LONG).show(); } return super.onOptionsItemSelected(item); } }</pre>
<p>Activity.xml</p>	<pre><?xml version="1.0" encoding="utf-8"?> <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"</pre>

	<pre> 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:layout_width="wrap_content" android:layout_height="wrap_content" android:text="Hello World!" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.OptionMenu" parent="Theme.MaterialComponents.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.OptionMenu" parent="Base.Theme.OptionMenu" /> </resources> </pre>
Option_menu.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <menu xmlns:android="http://schemas.android.com/apk/res/android"> <item android:layout_width="wrap_content" android:layout_height="wrap_content" android:id="@+id/btnNew" android:title="New" /> <item android:layout_width="wrap_content" android:layout_height="wrap_content" android:id="@+id/btnOpen" android:title="Open" /> <item android:layout_width="wrap_content" android:layout_height="wrap_content" android:id="@+id/btnClose" </pre>

```
    android:title="Close" />  
</menu>
```



Hello World!



Hello World!

Figure 33 Option Menu

Figure 34 Toast Message of Option Menu

No. 17	<h3>Designing Context menu</h3>
MainActivity.java	<pre> package com.example.contextmenu; import static com.example.contextmenu.R.id.mnNew; import androidx.annotation.NonNull; import androidx.appcompat.app.AppCompatActivity; import androidx.constraintlayout.widget.ConstraintLayout; import androidx.constraintlayout.widget.ConstraintSet; import android.annotation.SuppressLint; import android.graphics.Color; import android.os.Bundle; import android.view.ContextMenu; import android.view.MenuItem; import android.view.View; import android.widget.TextView; import android.widget.Toast; public class MainActivity extends AppCompatActivity { ConstraintLayout cs; TextView tv; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); tv = findViewById(R.id.tvHelloWorld); cs = findViewById(R.id.mainScreen); registerForContextMenu(tv); } @Override public void onCreateContextMenu(ContextMenu menu, View v, ContextMenu.ContextMenuItemInfo menuInfo) { getMenuInflater().inflate(R.menu.con_menu,menu); super.onCreateContextMenu(menu, v, menuInfo); } @Override public boolean onContextItemSelected(@NonNull MenuItem item) { int itemId = item.getItemId(); if (itemId == R.id.mnNew) { Toast.makeText(this, "New", Toast.LENGTH_LONG).show(); cs.setBackgroundColor(Color.BLACK); } else if (itemId == R.id.mnOpen) { Toast.makeText(this, "Open", Toast.LENGTH_SHORT).show(); cs.setBackgroundColor(Color.BLUE); } else if (itemId == R.id.mnClose) { } } </pre>

	<pre> Toast.makeText(this, "Close", Toast.LENGTH_SHORT).show(); cs.setBackgroundColor(Color.RED); } return super.onContextItemSelected(item); } } </pre>
Activity.xml	<pre> <?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:id="@+id/mainScreen" android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".MainActivity"> <TextView android:id="@+id/tvHelloWorld" android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="Context Menu" android:textSize="40dp" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.ContextMenu" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.ContextMenu" parent="Base.Theme.ContextMenu" /> </resources> </pre>
Con_menu.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <menu xmlns:android="http://schemas.android.com/apk/res/android"> <item </pre>

```
    android:id="@+id/mnNew"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:title="New" />
<item
    android:id="@+id/mnOpen"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:title="Open" />
<item
    android:id="@+id/mnClose"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:title="Close" />
</menu>
```

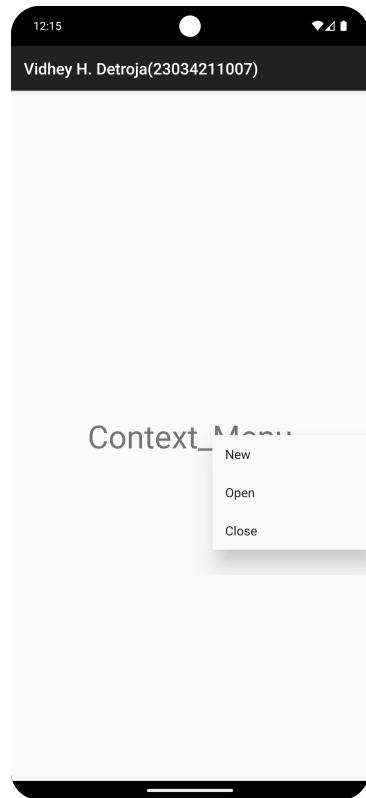


Figure 35 Context Menu

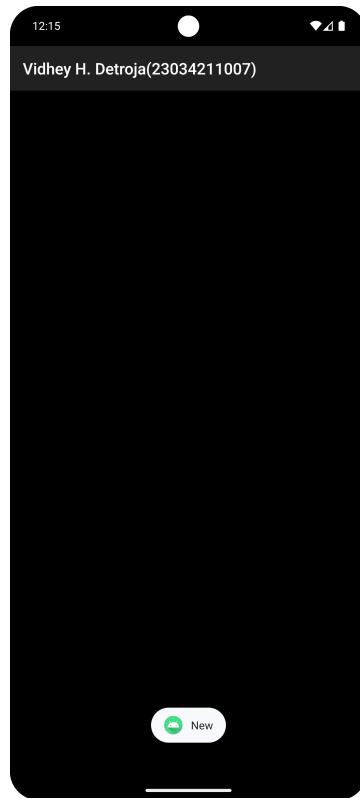


Figure 36 Change Background Color to Black using Context Menu

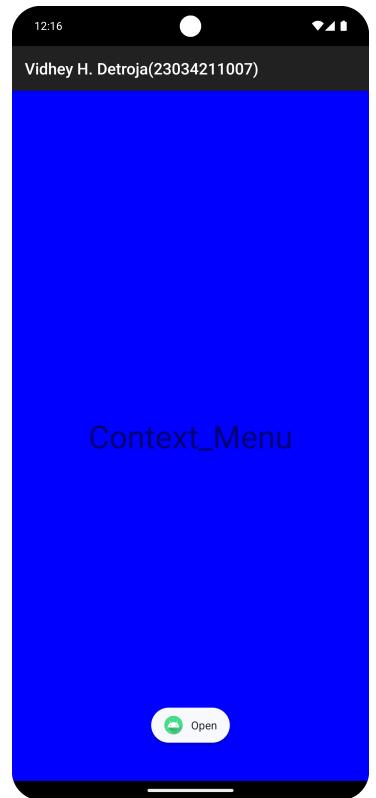
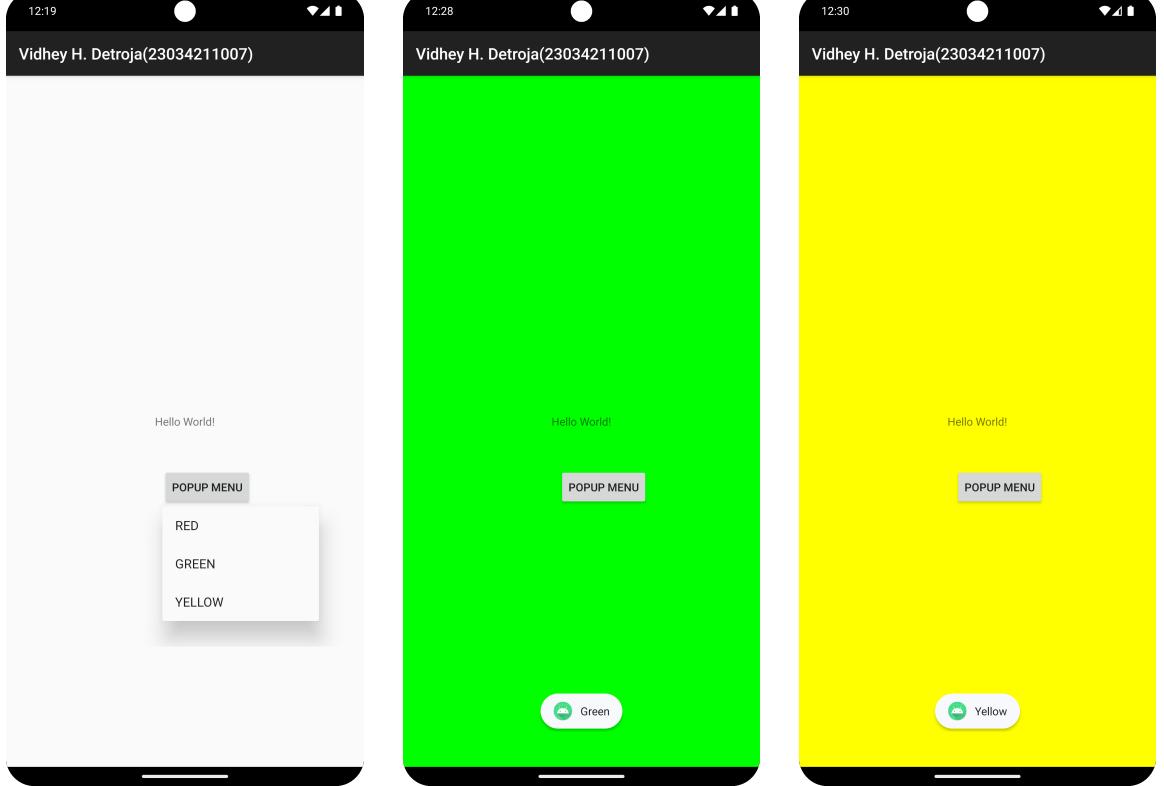


Figure 37 Change Background Color to Blue using Context Menu

<p>No. 18</p>	<p style="text-align: center;">Designing Popup menu.</p>
<p>MainActivity.java</p>	<pre>package com.example.popupmenu; import androidx.appcompat.app.AppCompatActivity; import androidx.constraintlayout.widget.ConstraintLayout; import android.graphics.Color; import android.os.Bundle; import android.view.MenuItem; import android.view.View; import android.widget.PopupMenu; import android.widget.TextView; import android.widget.Toast; public class MainActivity extends AppCompatActivity { ConstraintLayout cs; TextView tv; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); tv = findViewById(R.id.textView); cs = findViewById(R.id.mainScreen); registerForContextMenu(tv); } public void show_pop_menu(View view) { PopupMenu pm = new PopupMenu(this, view); pm.setOnMenuItemClickListener(new PopupMenu.OnMenuItemClickListener() { @Override public boolean onMenuItemClick(MenuItem item) { if (item.getItemId() == R.id.red) { Toast.makeText(MainActivity.this, "Red", Toast.LENGTH_SHORT).show(); cs.setBackgroundColor(Color.RED); } else if (item.getItemId() == R.id.Green) { Toast.makeText(MainActivity.this, "Green", Toast.LENGTH_SHORT).show(); cs.setBackgroundColor(Color.GREEN); } else if (item.getItemId() == R.id.yellow) { Toast.makeText(MainActivity.this, "Yellow", Toast.LENGTH_SHORT).show(); cs.setBackgroundColor(Color.YELLOW); } return false; } }); getMenuInflater().inflate(R.menu.pop_menu, pm.getMenu()); pm.show(); } }</pre>

	<pre> } } </pre>
Activity.xml	<pre> <?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:id="@+id/mainScreen" android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".MainActivity"> <TextView android:id="@+id/textView" android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="Hello World!" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" /> <Button android:id="@+id/btnPopupMenu" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="49dp" android:layout_marginEnd="140dp" android:onClick="show_popup_menu" android:text="PopUp Menu" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintTop_toBottomOf="@+id/textView" /> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.PopupMenu" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.PopupMenu" parent="Base.Theme.PopupMenu" /> </resources> </pre>

Pop_menu.xml	<pre><?xml version="1.0" encoding="utf-8"?> <menu xmlns:app="http://schemas.android.com/apk/res-auto" xmlns:android="http://schemas.android.com/apk/res/android"> <item android:id="@+id/red" android:layout_width="wrap_content" android:layout_height="wrap_content" android:title="RED" /> <item android:id="@+id/Green" android:layout_width="wrap_content" android:layout_height="wrap_content" android:title="GREEN" /> <item android:id="@+id/yellow" android:layout_width="wrap_content" android:layout_height="wrap_content" android:title="YELLOW" /> </menu></pre>
	 <p>Figure 38 Popup Menu</p> <p>Figure 39 Change Background Color to Green using Popup Menu</p> <p>Figure 40 Change Background Color to Yellow using Popup Menu</p>

No. 19	<h2 style="margin: 0;">Read, Write and Append Operation on File</h2>
MainActivity.java	<pre> package com.example.oprtnonfile; import android.os.Bundle; import android.view.View; import android.widget.EditText; import androidx.activity.EdgeToEdge; import androidx.appcompat.app.AppCompatActivity; import androidx.core.graphics.Insets; import androidx.core.view.ViewCompat; import androidx.core.view.WindowInsetsCompat; import java.io.DataInputStream; import java.io.FileInputStream; import java.io.FileNotFoundException; import java.io.FileOutputStream; import java.io.IOException; import java.util.Scanner; public class MainActivity extends AppCompatActivity { FileOutputStream fos; FileInputStream fis; EditText tv; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); EdgeToEdge.enable(this); setContentView(R.layout.activity_main); ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> { Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars()); v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom); return insets; }); tv = findViewById(R.id.editTextText); } public void write_file_code(View view) { String s = "Hello"; try { fos = openFileOutput("myfile.txt", MODE_PRIVATE); fos.write(s.getBytes()); fos.close(); } catch (FileNotFoundException e) { e.printStackTrace(); } } } </pre>

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

    public void append_file_code(View view) {
        String s = "I'm Vidhey";
        try {
            fos = openFileOutput("myfile.txt", MODE_APPEND);
            fos.write(s.getBytes());
            fos.close();
        }catch (FileNotFoundException e){
            e.printStackTrace();
        }catch (IOException e){
            e.printStackTrace();
        }
    }

    public void read_file_code(View view) {
        try{
            fis = openFileInput("myfile.txt");
            DataInputStream dis = new DataInputStream(fis);
            StringBuffer sb = new StringBuffer();
            String s = null;
            while ((s= dis.readLine())!=null){
                sb.append(s+"\n");
            }
            tv.setText(sb.toString());
            dis.close();
            fis.close();
        }
        catch (FileNotFoundException e){
            e.printStackTrace();
        }catch (IOException e){
            e.printStackTrace();
        }
    }
}
```

```
<?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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@color/cardview_dark_background"
    tools:context=".MainActivity">
```

	<pre> <LinearLayout android:layout_width="match_parent" android:layout_height="match_parent" android:orientation="vertical"> <EditText android:id="@+id/editTextText" android:layout_width="350dp" android:layout_height="285dp" android:layout_gravity="center" android:layout_marginTop="150dp" android:background="@drawable/edittext" android:ems="10" android:inputType="text" android:textAlignment="viewStart" android:hint="." /> <Button android:id="@+id(btnwrite" style="@style/Button2" android:onClick="write_file_code" android:layout_gravity="center" android:text="Write" /> <Button android:id="@+id/btnappend" android:layout_gravity="center" android:onClick="append_file_code" style="@style/Button2" android:text="Append" /> <Button android:id="@+id btnread" android:layout_gravity="center" android:onClick="read_file_code" style="@style/Button2" android:text="Read" /> </LinearLayout> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.OprtOnFile" </pre>

```

parent="Theme.MaterialComponents.DayNight.DarkActionBar">
    <!-- Customize your light theme here. -->
    <!-- <item name="colorPrimary">@color/my_light_primary</item> -->
</style>

<style name="Theme.OprtnOnFile" parent="Base.Theme.OprtnOnFile" />
<style name="Button2">
    <item name="android:layout_width">150dp</item>
    <item name="android:layout_height">70dp</item>
    <item name="android:textStyle">bold</item>
    <item name="android:textAlignment">center</item>
    <item name="android:textSize">20dp</item>
    <item name="android:layout_margin">10dp</item>
    <item name="android:background">@drawable/shape1</item>
</style>
</resources>

```

Edittext.xml

```

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

    <solid android:color="#F0F3FF" />
    <padding
        android:left="10dp"
        android:right="10dp"
        android:bottom="1dp"
        android:top="10dp" />
    <corners android:radius="30dp" />
</shape>

```

Shape1.xml

```

<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android"
    android:shape="rectangle">
    <corners
        android:radius="13dp" />
    <solid android:color="#74E291" />
    <stroke android:color="#211C6A" android:width="5dp"/>
    <size android:width="100dp"
        android:height="100dp" />
</shape>

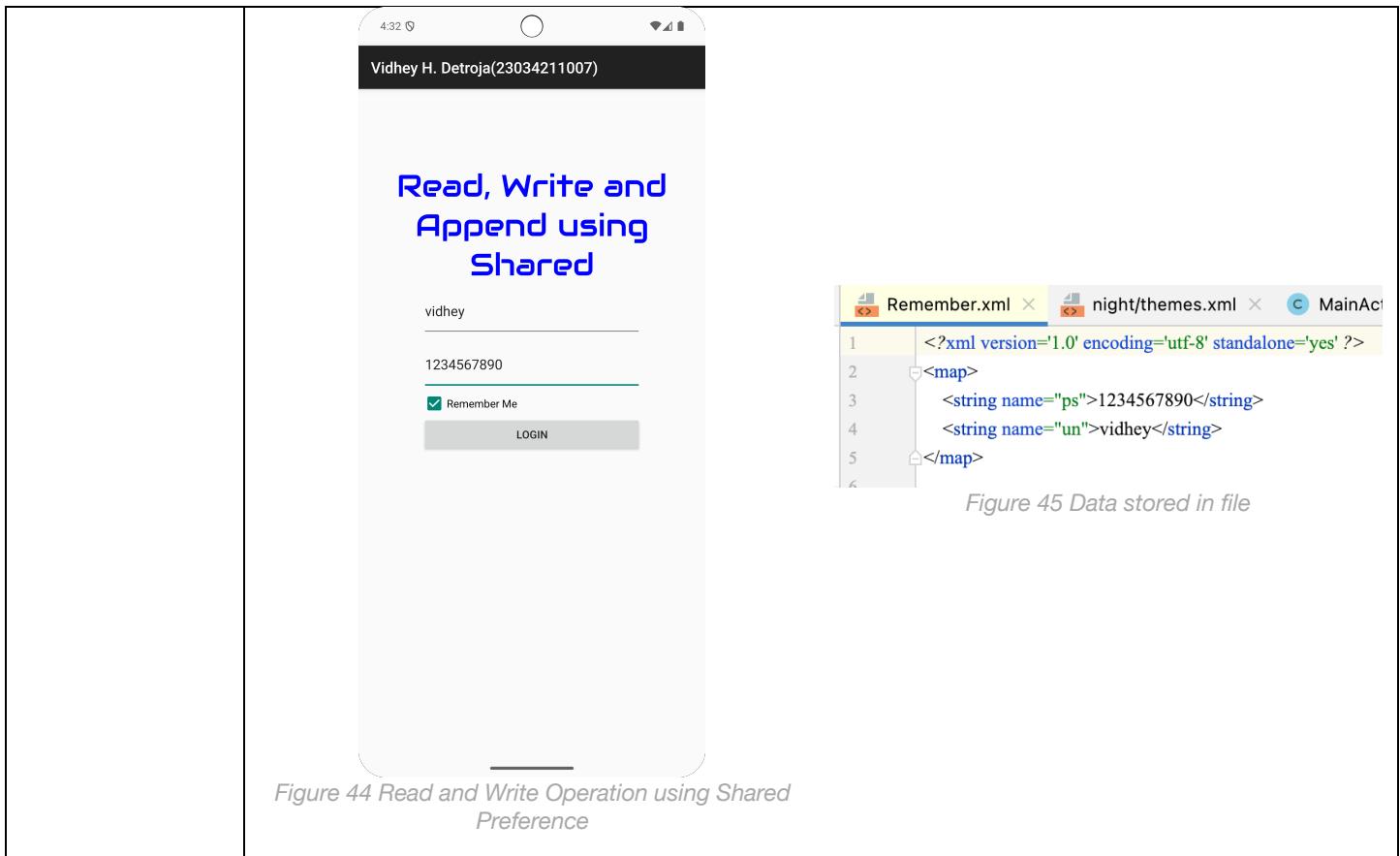
```



<p>No. 20</p>	<h3 style="text-align: center;">Read and Write using Shared Preference</h3>
<p>MainActivity.java</p>	<pre> package com.example.sharedpreference; import android.content.SharedPreferences; import android.os.Bundle; import android.view.View; import android.widget.CheckBox; import android.widget.EditText; import android.widget.Toast; import androidx.activity.EdgeToEdge; import androidx.appcompat.app.AppCompatActivity; import androidx.core.graphics.Insets; import androidx.core.view.ViewCompat; import androidx.core.view.WindowInsetsCompat; public class MainActivity extends AppCompatActivity { EditText e1, e2; CheckBox c1; String login = "Remember"; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); EdgeToEdge.enable(this); setContentView(R.layout.activity_main); ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> { Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars()); v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom); return insets; }); e1 = findViewById(R.id.etuser); e2 = findViewById(R.id.etpass); c1 = findViewById(R.id.cbremember); } public void stored_in_pref(View view) { boolean v = c1.isChecked(); if(v==true){ SharedPreferences sp = getSharedPreferences(login,0); SharedPreferences.Editor se = sp.edit(); se.putString("un",e1.getText().toString()); se.putString("ps",e2.getText().toString()); se.commit(); } else { </pre>

	<pre> SharedPreferences sp = getSharedPreferences(login,0); e1.setText(sp.getString("un","")); e2.setText(sp.getString("ps","")); } }</pre>
Activity_main.xml	<pre><?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:id="@+id/main" android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".MainActivity"> <LinearLayout android:layout_width="match_parent" android:layout_height="match_parent" android:orientation="vertical"> <TextView android:id="@+id/textView" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="150dp" android:layout_gravity="center" android:fontFamily="@font/audiowide" android:text="Read, Write and Append using Shared" android:textColor="#0000FF" android:textAlignment="center" android:textSize="40dp" /> <EditText android:id="@+id/etuser" android:layout_width="284dp" android:layout_height="69dp" android:layout_gravity="center" android:ems="10" android:hint="UserName" android:inputType="text" /> <EditText android:id="@+id/etpass" android:layout_width="284dp" android:layout_height="69dp" android:layout_gravity="center" android:ems="10" android:hint="Password"</pre>

	<pre> android:inputType="text" /> <CheckBox android:id="@+id/cbremember" android:layout_width="284dp" android:layout_height="wrap_content" android:layout_gravity="center" android:text="Remember Me" /> <Button android:id="@+id(btnlogin" android:layout_width="284dp" android:layout_height="wrap_content" android:onClick="stored_in_pref" android:layout_gravity="center" android:text="Login" /> </LinearLayout> </androidx.constraintlayout.widget.ConstraintLayout></pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources></pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.SharedPreference" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.SharedPreference" parent="Base.Theme.SharedPreference" /> </resources></pre>
Color.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <resources> <color name="purple_200">#FFBB86FC</color> <color name="purple_500">#FF6200EE</color> <color name="purple_700">#FF3700B3</color> <color name="teal_200">#FF03DAC5</color> <color name="teal_700">#FF018786</color> <color name="black">#FF000000</color> <color name="white">#FFFFFF</color> </resources></pre>



<p>No. 21</p>	<h3 style="text-align: center;">Perform CRUD operations on SQLite Database</h3> <pre style="font-family: monospace; margin: 10px 0;">package com.example.mycurdapp; 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 MainActivity extends AppCompatActivity implements View.OnClickListener{ EditText ed1 , ed2; Button b1, b2, b3; DataBaseHelper db; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); ed1 = findViewById(R.id.editTextText); ed2 = findViewById(R.id.editTextText2); b1 = findViewById(R.id.btnSave); b1.setOnClickListener(this); b2 = findViewById(R.id.btnview); b2.setOnClickListener(this); b3 = findViewById(R.id.btnreset); b3.setOnClickListener(this); db = new DataBaseHelper(this); } @Override public void onClick(View v) { if (v==b1){ insert_record(); } if (v==b2){ Intent i = new Intent(MainActivity.this, ViewActivity.class); startActivity(i); } if (v==b3){ ed1.setText(""); ed2.setText(""); } } }</pre>
<p>MainActivity.java</p>	

	<pre> public void insert_record(){ String n = ed1.getText().toString().trim(); String a = ed2.getText().toString().trim(); db.add_record(n, a); Toast.makeText(this, "Inserted Successfully", Toast.LENGTH_SHORT).show(); } } </pre>
Viewactivtiy.java	<pre> package com.example.mycurdapp; import androidx.appcompat.app.AppCompatActivity; import android.annotation.SuppressLint; import android.content.Intent; import android.database.Cursor; import android.os.Bundle; import android.view.View; import android.widget.Button; import android.widget.EditText; import android.widget.Toast; public class ViewActivity extends AppCompatActivity { private EditText eId, eName, eAddr; private Button bBack, bShow; private DataBaseHelper db; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_view); eId = findViewById(R.id.edNum); eName = findViewById(R.id.edName); eAddr = findViewById(R.id.edAddr); bBack = findViewById(R.id.btnBack); bShow = findViewById(R.id.btnShow); db = new DataBaseHelper(this); bBack.setOnClickListener(v -> { Intent intent = new Intent(ViewActivity.this, MainActivity.class); startActivity(intent); }); bShow.setOnClickListener(v -> { try { </pre>

```

        int recordId = Integer.parseInt(eId.getText().toString().trim());
        showRecord(recordId);
    } catch (NumberFormatException e) {

        Toast.makeText(ViewActivity.this, "Invalid ID format",
Toast.LENGTH_SHORT).show();
    }
}

@SuppressWarnings("Range")
private void showRecord(int id) {
    Cursor rec = null;
    try {

        rec = db.get_record(id);

        if (rec != null && rec.moveToFirst()) {

eName.setText(rec.getString(rec.getColumnIndex(DataBaseHelper.COL_NAME)));

eAddr.setText(rec.getString(rec.getColumnIndex(DataBaseHelper.COL_ADD)));
    } else {

        Toast.makeText(this, "Record not found",
Toast.LENGTH_SHORT).show();
        eName.setText("");
        eAddr.setText("");
    }
} catch (Exception e) {

    Toast.makeText(this, "Error while showing record",
Toast.LENGTH_SHORT).show();
} finally {

    if (rec != null) {
        rec.close();
    }
}
}

```

Databasehelper.java	<pre> package com.example.mycurdapp; import android.content.ContentValues; </pre>
---------------------	--

```
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;

public class DataBaseHelper extends SQLiteOpenHelper {

    public static final String DB_NAME = "PersonsDB";
    public static final String TB_NAME = "student";
    public static final String COL_ID = "sid";
    public static final String COL_NAME = "sname";
    public static final String COL_ADD = "saddr";
    private static final int DB_VER = 1;

    public DataBaseHelper(Context context){
        super(context, DB_NAME, null, DB_VER);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String sql = "CREATE TABLE " + TB_NAME + " (" +
                + COL_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                + COL_NAME + " TEXT, " +
                + COL_ADD + " TEXT);";
        db.execSQL(sql);
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        db.execSQL("DROP TABLE IF EXISTS " + TB_NAME);
        onCreate(db);
    }

    public boolean add_record(String name, String addr) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues cv = new ContentValues();
        cv.put(COL_NAME, name);
        cv.put(COL_ADD, addr);

        long result = db.insert(TB_NAME, null, cv);
        db.close();

        return result != -1;
    }

    public Cursor get_record(int id) {
        SQLiteDatabase db = this.getReadableDatabase();
        String sql = "SELECT * FROM " + TB_NAME + " WHERE " + COL_ID + " = " + id;
        return db.rawQuery(sql, null);
    }
}
```

	<pre>}</pre>
Activity_main.xml	<pre><?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:gravity="center" tools:context=".Login" > <TextView android:layout_width="match_parent" android:layout_height="wrap_content" android:text="@string/curd" android:gravity="center" android:layout_marginBottom="10dp" android:textStyle="bold" android:textColor="@color/black" android:textSize="35dp" android:fontFamily="cursive" ></TextView> <TextView android:layout_width="match_parent" android:layout_height="wrap_content" android:text="@string/operation" android:gravity="center" android:layout_marginBottom="10dp" android:textStyle="bold" android:textColor="@color/black" android:textSize="35dp" android:fontFamily="cursive" ></TextView> <com.google.android.material.textfield.TextInputLayout android:layout_width="match_parent" android:layout_height="wrap_content" > <com.google.android.material.textfield.TextInputEditText android:id="@+id/editTextText" android:hint="@string/name" android:layout_width="match_parent" android:layout_height="48dp" android:layout_marginRight="10dp" android:layout_marginLeft="10dp" android:gravity="center" > </pre>

```
></com.google.android.material.textfield.TextInputEditText>
</com.google.android.material.textfield.TextInputLayout>

<com.google.android.material.textfield.TextInputLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    >

    <com.google.android.material.textfield.TextInputEditText
        android:id="@+id/editTextText2"
        android:hint="@string/address"
        android:layout_width="match_parent"
        android:layout_height="48dp"
        android:layout_marginRight="10dp"
        android:layout_marginLeft="10dp"
        android:layout_marginTop="5dp"
        android:gravity="center"
        ></com.google.android.material.textfield.TextInputEditText>

    </com.google.android.material.textfield.TextInputLayout>

    <ProgressBar
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/bar"
        android:visibility="gone"
        ></ProgressBar>

    <Button
        android:id="@+id/btnsave"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="@string/save"
        ></Button>

    <Button
        android:id="@+id(btnview"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="@string/view"
        ></Button>

    <Button
        android:id="@+id/btnreset"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="@string/reset"
        ></Button>

    ></Button>
```

	</LinearLayout>
Activity_view.xml	<pre> <?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=".ViewActivity"> <LinearLayout android:layout_width="match_parent" android:layout_height="match_parent" android:orientation="vertical"> <LinearLayout android:layout_width="match_parent" android:layout_height="wrap_content" android:orientation="horizontal"> <TextView android:id="@+id/textView" android:layout_width="72dp" android:layout_height="31dp" android:layout_weight="1" android:text="ID" android:textSize="15dp" android:textAlignment="center"/> <EditText android:id="@+id/edNum" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_weight="1" android:ems="10" android:inputType="text" /> <Button android:id="@+id/btnShow" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_weight="1" android:text="Show" /> </LinearLayout> <EditText android:id="@+id/edName" </pre>

```

        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="text"
        android:hint="Name" />

    <EditText
        android:id="@+id/edAddr"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="text"
        android:hint="Address" />

    <Button
        android:id="@+id	btnBack"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Back" />
</LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

```

String.xml

```

<resources>
    <string name="app_name">Vidhey H. Detroja(23034211007)</string>
    <string name="curd">CURD</string>
    <string name="operation">Operation</string>
    <string name="name">Name</string>
    <string name="address">Address</string>
    <string name="save">Save</string>
    <string name="view">View</string>
    <string name="reset">Reset</string>
    <string name="click_to_login">Click To Login</string>
    <string name="click_to_register">Click To Register</string>
    <string name="log_out">Log Out</string>
</resources>

```

Theme.xml

```

<resources xmlns:tools="http://schemas.android.com/tools">
    <!-- Base application theme. -->
    <style name="Base.Theme.MyCurdApp"
        parent="Theme.MaterialComponents.DayNight.DarkActionBar">
        <!-- Customize your light theme here. -->
        <!-- <item name="colorPrimary">@color/my_light_primary</item> -->
        <!-- Customize your light theme here. -->
        <!-- <item name="colorPrimary">@color/my_light_primary</item> -->
        <!-- Primary brand color. -->
        <item name="colorPrimary">@color/purple_500</item>
        <item name="colorPrimaryVariant">@color/purple_700</item>
        <item name="colorOnPrimary">@color/white</item>
        <!-- Secondary brand color. -->

```

```

<item name="colorSecondary">@color/teal_200</item>
<item name="colorSecondaryVariant">@color/teal_700</item>
<item name="colorOnSecondary">@color/black</item>
<!-- Status bar color. -->
<item name="android:statusBarColor">?attr/colorPrimaryVariant</item>
<!-- Customize your theme here. -->
</style>
<style name="Theme.MyCurdApp" parent="Base.Theme.MyCurdApp" />
</resources>

```

Color.xml

```

<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="purple_200">#FFBB86FC</color>
    <color name="purple_500">#FF6200EE</color>
    <color name="purple_700">#FF3700B3</color>
    <color name="teal_200">#FF03DAC5</color>
    <color name="teal_700">#FF018786</color>
    <color name="black">#FF000000</color>
    <color name="white">#FFFFFF</color>
</resources>

```

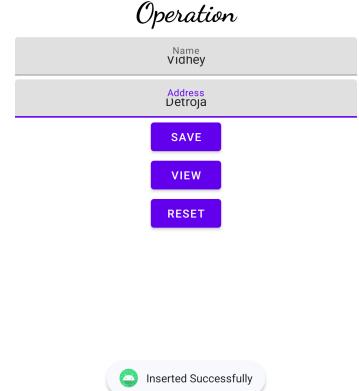
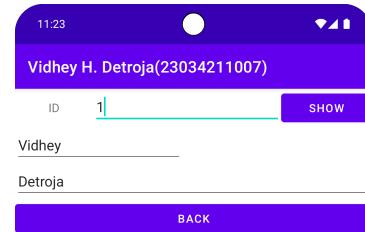
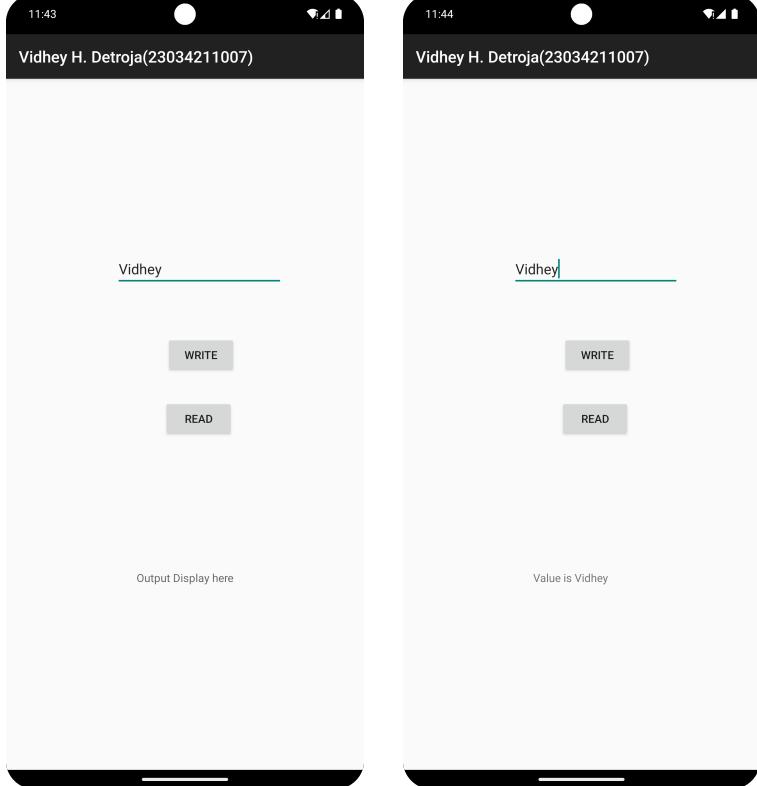
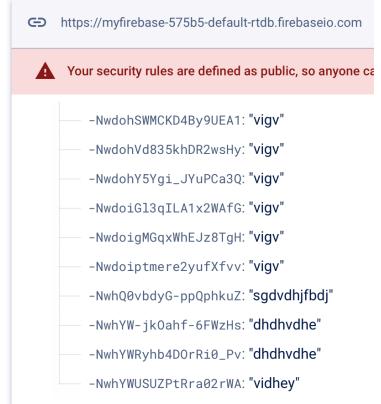


Figure 46 Data Inserted Successfully

Figure 47 Showing Inserted Data

<p>No. 22</p>	<h3 style="text-align: center;">Study of Firebase or Cloud Database (Latest)</h3> <pre> package com.example.fr; import androidx.annotation.NonNull; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.text.Editable; import android.util.Log; import android.view.View; import android.widget.EditText; import android.widget.TextView; import com.google.firebaseio.database.DataSnapshot; import com.google.firebaseio.database.DatabaseError; import com.google.firebaseio.database.DatabaseReference; import com.google.firebaseio.database.FirebaseDatabase; import com.google.firebaseio.database.ValueEventListener; public class MainActivity extends AppCompatActivity { EditText ed1; TextView tv1; @Override protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState); setContentView(R.layout.activity_main); ed1 = findViewById(R.id.editTextText); tv1 = findViewById(R.id.output); } public void read(View view) { FirebaseDatabase database = FirebaseDatabase.getInstance(); DatabaseReference myRef = database.getReference("Message"); myRef.addValueEventListener(new ValueEventListener() { @Override public void onDataChange(@NonNull DataSnapshot snapshot) { String value = snapshot.getValue(String.class); tv1.setText("Value is "+value); } @Override public void onCancelled(@NonNull DatabaseError error) { tv1.setText("Failed"+ error.toException()); } }); } } </pre>
<p>MainActivity.java</p>	

	<pre>public void write(View view) { String value = ed1.getText().toString(); FirebaseDatabase database = FirebaseDatabase.getInstance(); DatabaseReference myRef = database.getReference("Message"); myRef.setValue(value); }</pre>
Activity_main.xml	<pre><?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/output" android:layout_width="wrap_content" android:layout_height="wrap_content" app:layout_constraintBottom_toBottomOf="parent" android:hint="Output Display here" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.727" /> <Button android:id="@+id/btnread" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="32dp" android:layout_marginEnd="163dp" android:onClick="read" android:text="Read" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintTop_toBottomOf="@+id/btnwrite" /> <Button android:id="@+id/btnwrite" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="61dp" android:layout_marginEnd="160dp" android:onClick="write" android:text="Write" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintTop_toBottomOf="@+id/editTextText" /> <EditText</pre>

	<pre> android:id="@+id/editTextText" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginTop="216dp" android:layout_marginEnd="101dp" android:ems="10" android:inputType="text" android:hint="Enter input here" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintTop_toTopOf="parent" /> </androidx.constraintlayout.widget.ConstraintLayout> </pre>
String.xml	<pre> <resources> <string name="app_name">Vidhey H. Detroja(23034211007)</string> </resources> </pre>
Theme.xml	<pre> <resources xmlns:tools="http://schemas.android.com/tools"> <!-- Base application theme. --> <style name="Base.Theme.Fr" parent="Theme.AppCompat.DayNight.DarkActionBar"> <!-- Customize your light theme here. --> <!-- <item name="colorPrimary">@color/my_light_primary</item> --> </style> <style name="Theme.Fr" parent="Base.Theme.Fr" /> </resources> </pre>
	 <p>Figure 48 Writing Data Figure 49 Reading Data</p> <p>Output Display here Value is Vidhey</p>
	 <p>Figure 50 Inserted Data in RealTime Database</p>

