

Exercise 1

MainActivity.java

```
package com.example.ex1;
import androidx.appcompat.app.AppCompatActivity;
import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import android.widget.Button;
public class MainActivity extends AppCompatActivity {
    TextView t;
    Button b1,b2; int ch=1; float font=30; @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        t=(TextView)findViewById(R.id.T1);
        b1=(Button)findViewById(R.id.button);
        b2=(Button)findViewById(R.id.button2);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) { t.setTextSize( font );
                font = font +5; if (font == 50) font = 30;
            }
        });
        b2.setOnClickListener(new View.OnClickListener() { @Override
        public void onClick(View v) { switch(ch) {
            case 1:
                t.setTextColor( Color.RED ); break;
            case 2:
                t.setTextColor( Color.GREEN ); break;
            case 3:
                t.setTextColor( Color.BLUE ); break;

            case 4:
                t.setTextColor( Color.CYAN ); break;
            case 5:
                t.setTextColor( Color.YELLOW ); break;
            case 6:
                t.setTextColor( Color.MAGENTA ); break;
        }

        ch++;
        if(ch == 7)
            ch = 1;
        }
    }
}
```

```
    }  
});  
}  
}
```

Activity main.xml:

```
<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout  
    xmlns:android="http://schemas.android.com/apk/res/android"  
    xmlns:app="http://schemas.android.com/apk/res-auto"  
    xmlns:tools="http://schemas.android.com/tools"  
    android:id="@+id/main"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    tools:context=".MainActivity">  
  
    <TextView  
        android:id="@+id/T1"  
        android:layout_width="wrap_content"  
        android:layout_height="wrap_content"  
        android:layout_marginStart="172dp"  
        android:layout_marginTop="286dp"  
        android:layout_marginEnd="181dp"  
        android:text="WELCOME"  
        app:layout_constraintEnd_toEndOf="parent"  
        app:layout_constraintStart_toStartOf="parent"  
        app:layout_constraintTop_toTopOf="parent" />  
  
    <Button  
        android:id="@+id/button"  
        android:layout_width="wrap_content"  
        android:layout_height="wrap_content"  
        android:layout_marginStart="94dp"  
        android:layout_marginTop="396dp"  
        android:layout_marginEnd="95dp"  
        android:text="Font Size"  
        app:layout_constraintEnd_toStartOf="@+id/button2"  
        app:layout_constraintStart_toStartOf="parent"  
        app:layout_constraintTop_toTopOf="parent" />  
  
    <Button  
        android:id="@+id/button2"  
        android:layout_width="wrap_content"  
        android:layout_height="wrap_content"
```

```
    android:layout_marginStart="30dp"
    android:layout_marginTop="396dp"
    android:layout_marginEnd="95dp"
    android:layout_marginBottom="287dp"
    android:text="Color change"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toEndOf="@+id/button"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.0" />

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

Exercise 2
MainActivity.java

```

package com.example.exer2;
import androidx.appcompat.app.AppCompatActivity; import android.graphics.Color;
import android.os.Bundle;
import android.widget.AdapterView; import android.widget.AdapterView; import
android.widget.Button; import android.widget.ListView; import
android.widget.Spinner; import android.widget.Toast;
import android.view.View;
public class MainActivity extends AppCompatActivity { Button b1, b2, b3;
ListView l; Spinner s; @Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); setContentView(R.layout.activity_main);
b1=(Button)findViewById( R.id.b1 );
b2=(Button)findViewById( R.id.b2 ); b3=(Button)findViewById( R.id.b3 );
l=(ListView)findViewById( R.id.l ); s=(Spinner)findViewById( R.id.s );
b1.setOnClickListener( new View.OnClickListener()
{ @Override
public void onClick(View v) { b1.setTextColor( Color.RED );
}
} );
b2.setOnClickListener( new View.OnClickListener()
{ @Override
public void onClick(View v) { b2.setTextColor( Color.GREEN );
}
} );
b3.setOnClickListener( new View.OnClickListener()
{ @Override
public void onClick(View v) { b3.setTextColor( Color.BLUE );
}
} );
String a[]=new String[] {"Red", "Green","Blue"};

final ArrayAdapter<String> aa=new
ArrayAdapter<String>(this,android.R.layout.simple_dropdown_item_1line,a );
l.setAdapter( aa ); s.setAdapter( aa );
l.setOnItemClickListener( new AdapterView.OnItemClickListener()
{ @Override
public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
String s=(String)l.getItemAtPosition( position );
Toast.makeText(getApplicationContext(),"List View "+s,
Toast.LENGTH_SHORT).show();
}
} );
s.setOnItemClickListener( new AdapterView.OnItemClickListener()
{ @Override
public void onItemClick(AdapterView<?> parent, View view, int position, long id)

```

```

{
String s1=(String)parent.getItemAtPosition( position );

Toast.makeText(getApplicationContext(),"Spinner "+s1,
Toast.LENGTH_SHORT).show();
}
@Override
public void onNothingSelected(AdapterView<?> parent) {
}
} );
}
}
}

```

Activity main.xml:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent" android:layout_height="match_parent"
tools:context=".MainActivity">
<RelativeLayout android:id="@+id/relativeLayout" android:layout_width="368dp"
android:layout_height="495dp" android:layout_marginStart="8dp"
android:layout_marginTop="8dp" app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent">
<LinearLayout android:id="@+id/linearLayout"

android:layout_width="match_parent" android:layout_height="40dp"
android:layout_alignParentTop="true" android:layout_centerHorizontal="true"
android:layout_marginTop="28dp" android:orientation="vertical"
android:visibility="visible">
<TextView android:id="@+id/textView"
android:layout_width="match_parent" android:layout_height="40dp"
android:text="Layout Manager Event Listener"
android:textAlignment="center" android:textColor="@color/black"
android:textSize="24sp"
/>
</LinearLayout>
<LinearLayout android:id="@+id/linearLayout2"
android:layout_width="match_parent" android:layout_height="50dp"
android:layout_below="@+id/linearLayout"
android:layout_alignParentStart="true" android:layout_marginStart="11dp"
android:layout_marginTop="23dp" android:orientation="horizontal">
<Button

```

```
android:id="@+id/b1" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_weight="1"
android:text="RED" />
```

```
<Button
```

```
android:id="@+id/b2" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_weight="1"
android:text="GREEN" />
```

```
<Button
```

```
android:id="@+id/b3" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_weight="1"
android:text="BLUE" />
```

```
</LinearLayout>
```

```
<ListView
```

```
android:id="@+id/l" android:layout_width="match_parent"
android:layout_height="200dp" android:layout_alignParentEnd="true"
android:layout_centerVertical="true" />
```

```
<LinearLayout android:layout_width="match_parent" android:layout_height="50dp"
android:layout_alignStart="@+id/linearLayout2"
android:layout_alignParentBottom="true" android:layout_marginStart="110dp"
android:layout_marginBottom="52dp"
android:orientation="vertical">
```

```
<Spinner android:id="@+id/s"
android:layout_width="match_parent" android:layout_height="50dp"
android:visibility="visible" />
```

```
</LinearLayout>
```

```
</RelativeLayout>
```

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

Exercise 3

MainActivity.java

```
package com.example.exercise3;
import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle;
import android.graphics.Bitmap;
import android.graphics.Canvas; import android.graphics.Color; import
android.graphics.Paint; import android.graphics.drawable.BitmapDrawable; import
android.widget.ImageView;
public class MainActivity extends AppCompatActivity { ImageView i; @Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); setContentView(R.layout.activity_main);
Bitmap b= Bitmap.createBitmap( 720,1280,Bitmap.Config.ARGB_8888 );
i=(ImageView)findViewById(R.id.imageView); i.setBackgroundDrawable( new
BitmapDrawable( b ) ); Canvas canvas=new Canvas( b ); Paint paint =new Paint( );
paint.setColor( Color.BLUE ); paint.setTextSize( 50 );
canvas.drawText( "Rectangle", 420, 150, paint );
canvas.drawRect( 400, 200, 650, 700, paint );
canvas.drawText( "Circle",120, 150, paint ); canvas.drawCircle( 200,350, 150, paint );
canvas.drawText( "Square", 120, 800, paint );
canvas.drawRect( 50, 850, 350, 1150, paint );
canvas.drawText( "Line", 480, 800, paint );
canvas.drawLine( 520,850, 520, 1150, paint );    }}
```

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="wrap_content" android:layout_height="wrap_content"
tools:context=".MainActivity">
<RelativeLayout android:id="@+id/relativeLayout2" android:layout_width="368dp"
android:layout_height="495dp" android:layout_marginStart="8dp"
android:layout_marginTop="8dp" app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent">
<ImageView android:id="@+id/imageView" android:layout_width="match_parent"
android:layout_height="429dp"
app:srcCompat="@android:drawable/arrow_down_float" />
</RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Exercise 4

```

package com.example.exer4;
import androidx.appcompat.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.os.Bundle;
import android.widget.ImageView;

public class MainActivity extends AppCompatActivity {
    ImageView i;
    Button b1,b2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        i=(ImageView)findViewById( R.id.i );
        b1=(Button)findViewById( R.id.b1 );
        b2=(Button)findViewById( R.id.b2 );
        b1.setOnClickListener( new View.OnClickListener()
        {
            @Override
            public void onClick(View v) {
                new Thread( new Runnable() {
                    @Override
                    public void run() {
                        i.post( new Runnable() { @Override
                        public void run() {
                            i.setImageResource( R.drawable.halwa );
                        }
                    }
                } );
            }
        } ).start();
    }
    b2.setOnClickListener( new View.OnClickListener()
    { @Override
    public void onClick(View v) { new Thread( new Runnable() {
        @Override
        public void run() {
            i. post( new Runnable() { @Override
            public void run() {

                i. setImageResource( R.drawable.parotta );
            }
        }
    } );
    }
    } );
    }
    }

```



```

        } ).start();
    }
    } );
}
}

```

Activity main.xml:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent" android:layout_height="match_parent"
    tools:context=".MainActivity">
    <RelativeLayout android:id="@+id/relativeLayout" android:layout_width="368dp"
    android:layout_height="495dp" android:layout_marginStart="8dp"
    android:layout_marginTop="8dp" app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent">
    <ImageView android:id="@+id/i" android:layout_width="300dp"
        android:layout_height="300dp" android:layout_alignParentTop="true"
    android:layout_centerHorizontal="true" />
    <Button
    android:id="@+id/b1" android:layout_width="wrap_content"
    android:layout_height="wrap_content" android:layout_alignBaseline="@+id/b2"
    android:layout_alignStart="@+id/i" android:layout_alignBottom="@+id/b2"
    android:text="LOAD IMAGE 1" />
    <Button
        android:id="@+id/b2" android:layout_width="wrap_content"
    android:layout_height="wrap_content" android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true" android:layout_marginEnd="18dp"
    android:layout_marginBottom="54dp" android:text="LOAD IMAGE 2"
    tools:layout_editor_absoluteX="235dp" tools:layout_editor_absoluteY="385dp" />
    </RelativeLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

```

Exercise 5

Activity main.xml:

```

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

```

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

```
<RelativeLayout
    android:layout_width="368dp"
    android:layout_height="495dp"
    tools:layout_editor_absoluteX="8dp"
    tools:layout_editor_absoluteY="8dp">
```

```
<TextView
    android:id="@+id/f1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentTop="true"
    android:layout_alignStart="@+id/b1"
    android:layout_marginTop="65dp"
    android:text="FirstName" />
```

```
<TextView
    android:id="@+id/l1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/f1"
    android:layout_below="@+id/e1"
    android:layout_marginTop="16dp"
    android:text="LastName" />
```

```
<TextView
    android:id="@+id/m1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/b1"
    android:layout_below="@+id/e2"
    android:layout_marginTop="19dp"
    android:text="MailId" />
```

```
<EditText
    android:id="@+id/e1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignTop="@+id/f1"
    android:layout_marginEnd="24dp"
    android:ems="10"
```

```

        android:inputType="textPersonName" />
    <EditText
        android:id="@+id/e2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignStart="@+id/e1"
        android:layout_alignTop="@+id/l1"
        android:ems="10"
        android:inputType="textPersonName" />
    <EditText
        android:id="@+id/e3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignStart="@+id/e2"
        android:layout_alignTop="@+id/m1"
        android:ems="10"
        android:inputType="textPersonName" />
    <Button
        android:id="@+id/b1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/m1"
        android:layout_marginTop="52dp"
        android:layout_toStartOf="@+id/e3"
        android:text="Add" />
    <Button
        android:id="@+id/b2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignTop="@+id/b1"
        android:layout_centerHorizontal="true"
        android:text="Close" />
    <Button
        android:id="@+id/b3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/b2"
        android:layout_alignBottom="@+id/b2"
        android:layout_marginStart="12dp"
        android:layout_toEndOf="@+id/b2"
        android:text="Show" />
</RelativeLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

```

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">
    <RelativeLayout
        android:layout_width="368dp"
        android:layout_height="495dp"
        tools:layout_editor_absoluteX="8dp"
        tools:layout_editor_absoluteY="8dp">
    <TextView
        android:id="@+id/f2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_marginEnd="32dp"
        android:layout_marginTop="68dp"
        android:layout_toStartOf="@+id/e4"
        android:text="FirstName" />
    <EditText
        android:id="@+id/e4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignStart="@+id/b5"
        android:layout_alignTop="@+id/f2"
        android:ems="10"
        android:inputType="textPersonName" />
    <TextView
        android:id="@+id/l2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignStart="@+id/f2"
        android:layout_below="@+id/e4"
        android:layout_marginTop="20dp"
        android:text="LastName" />
    <EditText
        android:id="@+id/e5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```

        android:layout_alignStart="@+id/e4"
        android:layout_alignTop="@+id/l2"
        android:ems="10"
        android:inputType="textPersonName" />
<TextView
    android:id="@+id/m2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/l2"
    android:layout_below="@+id/e5"
    android:layout_marginTop="21dp"
    android:text="MailId" />
<EditText
    android:id="@+id/e6"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/e5"
    android:layout_alignTop="@+id/m2"
    android:ems="10"
    android:inputType="textPersonName" />
<Button
    android:id="@+id/b4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/m2"
    android:layout_below="@+id/e6"
    android:layout_marginTop="35dp"
    android:text="previous" />
<Button
    android:id="@+id/b5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBottom="@+id/b4"
    android:layout_centerHorizontal="true"
    android:text="Next" />
<Button
    android:id="@+id/b6"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBaseline="@+id/b5"
    android:layout_alignBottom="@+id/b5"
    android:layout_marginStart="13dp"
    android:layout_toEndOf="@+id/b5"
    android:text="Back" />
</RelativeLayout>

```

</androidx.constraintlayout.widget.ConstraintLayout>

MainActivity.java

```
package com.example.exp5;
```

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

```
import android.os.Bundle;
```

```
import android.content.Intent;
```

```
import android.database.sqlite.SQLiteDatabase;
```

```
import android.view.View;
```

```
import android.widget.Button;
```

```
import android.widget.EditText;
```

```
import android.widget.Toast;
```

```
public class MainActivity extends AppCompatActivity {
```

```
    SQLiteDatabase db;
```

```
    String f1,l1,m1;
```

```
    EditText e1,e2,e3;
```

```
    Button add,close,show;
```

```
    @Override
```

```
    protected void onCreate(Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);
```

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

```
        db=openOrCreateDatabase("Mydb",MODE_PRIVATE,null);
```

```
        db.execSQL("CREATE TABLE IF NOT EXISTS student(fname VARCHAR, lname VARCHAR, email VARCHAR);");
```

```
        add=(Button)findViewById(R.id.b1);
```

```
        close=(Button)findViewById(R.id.b2);
```

```
        show=(Button)findViewById(R.id.b3);
```

```
        add.setOnClickListener(new View.OnClickListener() {
```

```
            @Override
```

```
            public void onClick(View view) {
```

```
                e1=(EditText)findViewById(R.id.e1);
```

```
                e2=(EditText)findViewById(R.id.e2);
```

```
                e3=(EditText)findViewById(R.id.e3);
```

```
                f1=e1.getText().toString();
```

```
                l1=e2.getText().toString();
```

```
                m1=e3.getText().toString();
```

```
                db.execSQL("INSERT INTO student VALUES ('"+f1+"','"+l1+"','"+m1+"');");
```

```
                Toast.makeText(getApplicationContext(),
```

```

        "Row Inserted",Toast.LENGTH_LONG).show();
    }
});
close.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        System.exit(0);
    }
});
show.setOnClickListener(new View.OnClickListener()
{ @Override
public void onClick(View view) {
    Intent i=new Intent(getApplicationContext(),MainActivity2.class);
    startActivity(i);
}
});
}
}

```

MainActivity2.java

```

package com.example.exp5;
import androidx.appcompat.app.AppCompatActivity;
import android.annotation.SuppressLint;
import android.content.Intent; import
    android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;

import android.os.Bundle; import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
public class MainActivity2 extends AppCompatActivity {
    EditText fn,ln,em;
    Button prev,next,back;
    SQLiteDatabase db;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
        fn=(EditText)findViewById(R.id.e4);
        ln=(EditText)findViewById(R.id.e5);
        em=(EditText)findViewById(R.id.e6);
        prev=(Button)findViewById(R.id.b4);
        next=(Button)findViewById(R.id.b5);
        back=(Button)findViewById(R.id.b6);
    }
}

```

```

db=openOrCreateDatabase("Mydb",MODE_PRIVATE,null);
final Cursor c=db.rawQuery("select * from student",null);
c.moveToFirst();
back.setOnClickListener(new View.OnClickListener()
{ @Override
public void onClick(View view) {
    Intent i1=new Intent(getApplicationContext(),MainActivity.class);
    startActivity(i1);
}
});
prev.setOnClickListener(new View.OnClickListener()
{ @SuppressWarnings("Range")
@Override
public void onClick(View view) {
    try {
        c.moveToPrevious();
        fn.setText(c.getString(c.getColumnIndex("fname")));
        ln.setText(c.getString(c.getColumnIndex("lname")));
        em.setText(c.getString(c.getColumnIndex("email")));
    }
    catch (Exception e){
        Toast.makeText(getApplicationContext(),
            "First Record",Toast.LENGTH_SHORT).show();
        e.printStackTrace();
    }
}
});
next.setOnClickListener(new View.OnClickListener() {
    @SuppressWarnings("Range")
    @Override
    public void onClick(View view) {
        try{
            c.moveToNext();
            fn.setText(c.getString(c.getColumnIndex("fname")));
            ln.setText(c.getString(c.getColumnIndex("lname")));
            em.setText(c.getString(c.getColumnIndex("email")));
        }
        catch (Exception e){
            Toast.makeText(getApplicationContext(),
                "Last Record",Toast.LENGTH_SHORT).show();
        }
    }
});
}
}
}
}

```


Exercise 6

Main activity.java:

```
package com.example.ex6;
import android.Manifest;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.os.Environment;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;
import java.io.File;
```

```

import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;

public class MainActivity extends AppCompatActivity {

    private EditText editText;
    private TextView textView;
    private static final int STORAGE_PERMISSION_CODE = 1;
    private static final String FILE_NAME = "myfile.txt"; // File name to be stored on
SD Card

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

        editText = findViewById(R.id.editText);
        textView = findViewById(R.id.textView);
        Button btnWrite = findViewById(R.id.btnWrite);
        Button btnRead = findViewById(R.id.btnRead);

        // Check & Request Permissions
        if (ContextCompat.checkSelfPermission(this,
Manifest.permission.WRITE_EXTERNAL_STORAGE)
        != PackageManager.PERMISSION_GRANTED) {
            ActivityCompat.requestPermissions(this,
                new String[]{Manifest.permission.WRITE_EXTERNAL_STORAGE,
Manifest.permission.READ_EXTERNAL_STORAGE},
                STORAGE_PERMISSION_CODE);
        }

        // Write Button Click
        btnWrite.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                writeToSDCard();
            }
        });

        // Read Button Click
        btnRead.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                readFromSDCard();
            }
        });
    }
}

```

```

    }
    });
}

// Function to write to SD Card
private void writeToSDCard() {
    if (isExternalStorageWritable()) {
        File sdCard = Environment.getExternalStorageDirectory();
        File dir = new File(sdCard.getAbsolutePath() + "/MyAppFolder");
        if (!dir.exists()) {
            dir.mkdirs(); // Create directory if not exists
        }

        File file = new File(dir, FILE_NAME);
        try (FileOutputStream fos = new FileOutputStream(file)) {
            String data = editText.getText().toString();
            fos.write(data.getBytes());
            Toast.makeText(this, "Data Written to SD Card",
Toast.LENGTH_SHORT).show();
        } catch (IOException e) {
            e.printStackTrace();
            Toast.makeText(this, "Failed to Write to SD Card",
Toast.LENGTH_SHORT).show();
        }
    } else {
        Toast.makeText(this, "SD Card Not Available",
Toast.LENGTH_SHORT).show();
    }
}

// Function to read from SD Card
private void readFromSDCard() {
    if (isExternalStorageReadable()) {
        File sdCard = Environment.getExternalStorageDirectory();
        File dir = new File(sdCard.getAbsolutePath() + "/MyAppFolder");
        File file = new File(dir, FILE_NAME);

        if (!file.exists()) {
            Toast.makeText(this, "File Not Found", Toast.LENGTH_SHORT).show();
            return;
        }

        try (FileInputStream fis = new FileInputStream(file)) {
            int c;
            StringBuilder sb = new StringBuilder();

```

```

        while ((c = fis.read()) != -1) {
            sb.append((char) c);
        }
        textView.setText(sb.toString()); // Display read data
        Toast.makeText(this, "Data Read from SD Card",
Toast.LENGTH_SHORT).show();
    } catch (IOException e) {
        e.printStackTrace();
        Toast.makeText(this, "Failed to Read from SD Card",
Toast.LENGTH_SHORT).show();
    }
} else {
    Toast.makeText(this, "SD Card Not Available",
Toast.LENGTH_SHORT).show();
}
}

// Check if external storage is writable
private boolean isExternalStorageWritable() {
    return
Environment.getExternalStorageState().equals(Environment.MEDIA_MOUNTED);
}

// Check if external storage is readable
private boolean isExternalStorageReadable() {
    String state = Environment.getExternalStorageState();
    return (state.equals(Environment.MEDIA_MOUNTED) ||
state.equals(Environment.MEDIA_MOUNTED_READ_ONLY));
}

// Handle permission request result
@Override
public void onRequestPermissionsResult(int requestCode, @NonNull String[]
permissions, @NonNull int[] grantResults) {
    super.onRequestPermissionsResult(requestCode, permissions, grantResults);
    if (requestCode == STORAGE_PERMISSION_CODE) {
        if (grantResults.length > 0 && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
            Toast.makeText(this, "Storage Permission Granted",
Toast.LENGTH_SHORT).show();
        } else {
            Toast.makeText(this, "Storage Permission Denied",
Toast.LENGTH_SHORT).show();
        }
    }
}

```

```
}  
}
```

Androidmanifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
    xmlns:tools="http://schemas.android.com/tools">  
  
    <!-- Permissions for reading and writing to external storage -->  
    <uses-permission  
android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>  
    <uses-permission  
android:name="android.permission.READ_EXTERNAL_STORAGE"/>  
  
    <!-- Required for Android 10+ Scoped Storage -->  
    <uses-permission  
android:name="android.permission.MANAGE_EXTERNAL_STORAGE"/>  
  
    <application  
        android:allowBackup="true"  
        android:dataExtractionRules="@xml/data_extraction_rules"  
        android:fullBackupContent="@xml/backup_rules"  
        android:icon="@mipmap/ic_launcher"  
        android:label="@string/app_name"  
        android:roundIcon="@mipmap/ic_launcher_round"  
        android:supportsRtl="true"  
        android:theme="@style/Theme.Ex6"  
        tools:targetApi="31">  
  
        <activity  
            android:name=".MainActivity"  
            android:exported="true">  
            <intent-filter>  
                <action android:name="android.intent.action.MAIN" />  
                <category android:name="android.intent.category.LAUNCHER" />  
            </intent-filter>  
        </activity>  
    </application>  
</manifest>
```

activity_main.xml

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

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

```
<EditText
    android:id="@+id/editText"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:hint="Enter text"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    android:layout_margin="16dp" />
```

```
<Button
    android:id="@+id/btnWrite"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Write to SD Card"
    app:layout_constraintTop_toBottomOf="@id/editText"
    app:layout_constraintStart_toStartOf="parent"
    android:layout_marginTop="24dp"
    android:layout_marginStart="24dp" />
```

```
<Button
    android:id="@+id/btnRead"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Read from SD Card"
    app:layout_constraintTop_toBottomOf="@id/editText"
    app:layout_constraintEnd_toEndOf="parent"
    android:layout_marginTop="24dp"
    android:layout_marginEnd="24dp" />
```

```
<TextView
    android:id="@+id/textView"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:text="Content will appear here"
    app:layout_constraintTop_toBottomOf="@id/btnWrite"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
```

```
    android:layout_marginTop="32dp"
    android:padding="16dp" />
```

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

Exercise 7

MainActivity.java

```
package com.example.ex7;
import android.Manifest;
import android.app.Notification;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Intent;
import android.os.Build;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.view.View;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.NotificationCompat;
import androidx.core.app.NotificationManagerCompat;
import android.content.pm.PackageManager;
import android.util.Log;

public class MainActivity extends AppCompatActivity {
    Button b;
    EditText e;
```

```
private static final String CHANNEL_ID = "notification_channel_id"; // Channel ID
for notifications
```

```
@Override
```

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

```
b = findViewById(R.id.b);
e = findViewById(R.id.e);
```

```
// Request notification permission for Android 13 and higher
if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.TIRAMISU) {
    if (checkSelfPermission(Manifest.permission.POST_NOTIFICATIONS) !=
        PackageManager.PERMISSION_GRANTED) {
        requestPermissions(new String[] {Manifest.permission.POST_NOTIFICATIONS}, 1);
    }
}
```

```
// Create Notification Channel for Android 8.0 (API 26) or higher
if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
    CharSequence name = "Default Channel";
    String description = "Channel for notifications";
    int importance = NotificationManager.IMPORTANCE_DEFAULT;
    NotificationChannel channel = new NotificationChannel(CHANNEL_ID, name,
        importance);
    channel.setDescription(description);
```

```
NotificationManager notificationManager =
    getSystemService(NotificationManager.class);
if (notificationManager != null) {
    notificationManager.createNotificationChannel(channel);
} }
```

```
// Set OnClickListener to trigger the notification
b.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String message = e.getText().toString();
        Log.d("Notification", "Button clicked, message: " + message);
```

```
// Create an intent to open MainActivity2 when the notification is tapped
Intent intent = new Intent(MainActivity.this, MainActivity2.class);
PendingIntent pendingIntent = PendingIntent.getActivity(MainActivity.this, 0, intent,
    PendingIntent.FLAG_IMMUTABLE);
```



```

// Build the notification with the text from EditText
Notification notification = new NotificationCompat.Builder(MainActivity.this,
CHANNEL_ID)
.setContentTitle("New Message")
.setContentText(message) // Use the text entered in the EditText
.setSmallIcon(R.mipmap.ic_launcher)
.setContentIntent(pendingIntent) // Open MainActivity2 when tapped
.setAutoCancel(true) // Remove notification after tapping
.build();

// Show the notification
NotificationManagerCompat notificationManagerCompat =
NotificationManagerCompat.from(MainActivity.this);
notificationManagerCompat.notify(0, notification);
Log.d("Notification", "Notification sent successfully with message: " + message);
}
});
}
}

```

MainActivity2.java

```

package com.example.ex7;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity2 extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main2);
}
}

```

activity_main.xml:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context="com.example.ex7.MainActivity">

<RelativeLayout
android:layout_width="368dp"

```

```
android:layout_height="495dp"
tools:layout_editor_absoluteX="8dp"
tools:layout_editor_absoluteY="8dp">
```

```
<TextView
android:id="@+id/textView"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentTop="true"
android:layout_centerHorizontal="true"
android:layout_marginTop="22dp"
android:text="Message"
android:textSize="24sp"
android:textStyle="bold" />
```

```
<EditText
android:id="@+id/e"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/textView"
android:layout_centerHorizontal="true"
android:layout_marginTop="40dp"
android:ems="10"
android:inputType="textPersonName" />
```

```
<Button
android:id="@+id/b"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignStart="@+id/textView"
android:layout_below="@+id/e"
android:layout_marginTop="72dp"
android:text="Notify" />
</RelativeLayout>
```

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

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="com.example.ex7.MainActivity2">

<!-- Add any UI elements for MainActivity2 here -->

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

AndroidManifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools">
<uses-permission android:name="android.permission.POST_NOTIFICATIONS" />
<application
android:allowBackup="true"
android:dataExtractionRules="@xml/data_extraction_rules"
android:fullBackupContent="@xml/backup_rules"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:roundIcon="@mipmap/ic_launcher_round"
android:supportsRtl="true"
android:theme="@style/Theme.Ex7"
tools:targetApi="31">
<activity
android:name=".MainActivity"
android:exported="true">
<intent-filter>
<action android:name="android.intent.action.MAIN" />
<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
</activity>
</application>

</manifest>
```

Exercise 8

activity_main.xml:

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

```
<RelativeLayout
android:id="@+id/relativeLayout"
android:layout_width="0dp"
android:layout_height="495dp"
android:layout_marginStart="16dp"
android:layout_marginTop="28dp"
android:layout_marginEnd="16dp"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent">
```

```
<TextView
android:id="@+id/tv"
android:layout_width="wrap_content"
android:layout_height="10mm"
android:layout_alignParentTop="true"
```

```
android:layout_centerHorizontal="true"
android:layout_marginTop="117dp"
android:text="GPS" />
```

```
<TextView
android:id="@+id/l1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/tv"
android:layout_alignParentStart="true"
android:layout_marginStart="41dp"
android:layout_marginTop="45dp"
android:text="latitude" />
```

```
<TextView
android:id="@+id/l2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/l1"
android:layout_alignEnd="@+id/l1"
android:layout_marginTop="66dp"
android:layout_marginEnd="-3dp"
android:text="longitude" />
```

```
<EditText
android:id="@+id/e1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_above="@+id/l2"
android:layout_marginStart="20dp"
android:layout_toEndOf="@+id/l1"
android:ems="10"
android:inputType="textPersonName" />
```

```
<EditText
android:id="@+id/e2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/e1"
android:layout_alignEnd="@+id/e1"
android:layout_marginTop="48dp"
android:layout_marginEnd="-5dp"
android:ems="10"
android:inputType="textPersonName" />
```

```
<Button
android:id="@+id/b1"
android:layout_width="130dp"
android:layout_height="wrap_content"
android:layout_below="@+id/e2"
android:layout_alignStart="@+id/e2"
android:layout_marginStart="10dp"
android:layout_marginTop="97dp"
android:text="locate" />
</RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

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">

<WebView
android:id="@+id/w1"
android:layout_width="match_parent"
android:layout_height="match_parent"/>

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

MainActivity.java:

```
package com.example.ex8;
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 {

    Button b1;
    EditText e1, e2;
```

```

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

    b1 = findViewById(R.id.b1);
    e1 = findViewById(R.id.e1);
    e2 = findViewById(R.id.e2);

    b1.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String latitude = e1.getText().toString();
            String longitude = e2.getText().toString();

            // Validation before starting the next activity
            if (latitude.isEmpty() || longitude.isEmpty()) {
                Toast.makeText(MainActivity.this, "Please enter both latitude and longitude",
                    Toast.LENGTH_SHORT).show();
            } else {
                Intent i = new Intent(getApplicationContext(), MainActivity2.class);
                i.putExtra("e1", latitude);
                i.putExtra("e2", longitude);
                startActivity(i);
            }
        }
    });
}

```

MainActivity2.java:

```

package com.example.ex8;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.webkit.WebView;
import android.webkit.WebViewClient;
import android.widget.Toast;

public class MainActivity2 extends AppCompatActivity {
    WebView w1;
    String lat, long1;

```

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main2);

    // Initialize WebView
    w1 = findViewById(R.id.w1);

    // Get Intent Data
    Bundle b = getIntent().getExtras();
    if (b != null) {
        lat = b.getString("e1", "0");
        long1 = b.getString("e2", "0");
    } else {
        lat = "0";
        long1 = "0";
    }

    // Check if valid coordinates are received
    if (lat.equals("0") || long1.equals("0")) {
        Toast.makeText(this, "Invalid coordinates received!",
            Toast.LENGTH_SHORT).show();
        return;
    }

    // Debugging Logs
    Log.d("DEBUG", "Latitude: " + lat + ", Longitude: " + long1);

    // WebView Settings
    w1.setWebViewClient(new WebViewClient());
    w1.getSettings().setJavaScriptEnabled(true);
    w1.getSettings().setDomStorageEnabled(true);

    // Google Maps URL
    String url = "https://www.google.com/maps?q=" + lat + "," + long1;
    Log.d("DEBUG", "Loading URL: " + url);
    w1.loadUrl(url);
}
}
```


AndroidManifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.example.ex8">

<!-- Add the Internet permission -->
<uses-permission android:name="android.permission.INTERNET" />

<application
android:allowBackup="true"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:theme="@style/Theme.Ex8">

<!-- Specify android:exported for the activities -->
<activity
android:name=".MainActivity2"
android:exported="true" /> <!-- Exported so it can be launched from MainActivity -->

<activity
android:name=".MainActivity"
android:exported="true"> <!-- Exported because it's the launcher activity -->
<!-- Make MainActivity the launcher activity -->
<intent-filter>
<action android:name="android.intent.action.MAIN" />
<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
</activity>

</application>
</manifest>
```

Exercise 9

activity_main2.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="From"
        android:textSize="18sp"
        android:textStyle="bold"/>

    <EditText
        android:id="@+id/fromEmail"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your email"
        android:inputType="textEmailAddress"/>

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="To"
        android:textSize="18sp"
        android:textStyle="bold"/>

    <EditText
        android:id="@+id/toEmail"
```

```
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="Enter recipient email"
android:inputType="textEmailAddress"/>
```

```
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Subject"
android:textSize="18sp"
android:textStyle="bold"/>
```

```
<EditText
android:id="@+id/emailSubject"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="Enter subject"
android:inputType="text"/>
```

```
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Message"
android:textSize="18sp"
android:textStyle="bold"/>
```

```
<EditText
android:id="@+id/emailMessage"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="Enter message"
android:inputType="textMultiLine"
android:lines="5"/>
```

```
<Button
android:id="@+id/sendButton"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="SEND"
android:layout_marginTop="20dp"/>
```

```
</LinearLayout>
```

MainActivity.java

```

package com.example.ex9;

import android.content.DialogInterface;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.activity.result.ActivityResultLauncher;
import androidx.activity.result.contract.ActivityResultContracts;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    Button sendButton;
    EditText fromEmail, toEmail, emailSubject, emailMessage;

    // Registering ActivityResultLauncher
    private final ActivityResultLauncher<Intent> emailLauncher =
        registerForActivityResult(new ActivityResultContracts.StartActivityForResult(), result
        -> {
            // When the user returns from the email client, show success alert
            showSuccessDialog();
        });

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

        sendButton = findViewById(R.id.sendButton);
        fromEmail = findViewById(R.id.fromEmail);
        toEmail = findViewById(R.id.toEmail);
        emailSubject = findViewById(R.id.emailSubject);
        emailMessage = findViewById(R.id.emailMessage);

        sendButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String from = fromEmail.getText().toString().trim();
                String to = toEmail.getText().toString().trim();
                String subject = emailSubject.getText().toString().trim();
                String message = emailMessage.getText().toString().trim();
            }
        });
    }
}

```

```

if (!to.isEmpty()) {
    Intent emailIntent = new Intent(Intent.ACTION_SEND);
    emailIntent.setType("message/rfc822");
    emailIntent.putExtra(Intent.EXTRA_EMAIL, new String[]{to});
    emailIntent.putExtra(Intent.EXTRA_SUBJECT, subject);
    emailIntent.putExtra(Intent.EXTRA_TEXT, "From: " + from + "\n\n" + message);

    try {
        emailLauncher.launch(Intent.createChooser(emailIntent, "Choose an Email client"));
    } catch (android.content.ActivityNotFoundException ex) {
        Toast.makeText(MainActivity.this, "No Email clients installed.",
            Toast.LENGTH_SHORT).show();
    }
    } else {
        Toast.makeText(MainActivity.this, "Please enter recipient email",
            Toast.LENGTH_SHORT).show();
    }
    });
}

// Function to show a success dialog when returning from email
private void showSuccessDialog() {
    AlertDialog.Builder builder = new AlertDialog.Builder(MainActivity.this);
    builder.setTitle("Email Sent")
        .setMessage("Your email has been successfully sent.")
        .setPositiveButton("OK", new DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialog, int which) {
                dialog.dismiss();
            }
        })
        .show();
}

```

AndroidManifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.example.ex9">

<application
android:allowBackup="true"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:roundIcon="@mipmap/ic_launcher_round"
android:supportRtl="true"
android:theme="@style/AppTheme">

<activity
android:name=".MainActivity"
android:exported="true"> <!-- Ensure compatibility with Android 12+ -->

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

</activity>

</application>

</manifest>
```

Exercise 10

activity_main.xml:

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

    <LinearLayout
        android:id="@+id/linearLayout"
        android:layout_width="0dp"
        android:layout_height="0dp"
        android:orientation="vertical"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <TextView
            android:id="@+id/textView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="@string/regionallanguage" />

        <TextView
            android:id="@+id/textView2"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="@string/username" />

        <EditText
            android:id="@+id/editTextTextPersonName"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:ems="10"
```

```

        android:textSize="20dp"
        android:hint="@string/hint1"
        android:inputType="textPersonName" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="@string/password" />

<EditText
    android:id="@+id/editTextTextPersonName2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"
    android:textSize="20dp"
    android:hint="@string/hint1"
    android:inputType="textPersonName" />

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

<Button
    android:id="@+id/button2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="@string/changelanguage" />

</LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

```

MainActivity.java:

```

package com.example.exp10;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.app.AlertDialog;
import android.app.Activity;
import android.content.DialogInterface;
import android.content.SharedPreferences;
import android.content.res.Configuration;
import android.os.Bundle;

```



```
import android.view.View;
import android.widget.Button;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {
    Button b2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b2 = findViewById(R.id.button2);

        loadLocale(); // Load saved language

        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                showChangeLanguage();
            }
        });
    }
    private void showChangeLanguage() {
        final String[] listItems = {"English", "Arabic", "Tamil", "Telugu"};

        AlertDialog.Builder m = new AlertDialog.Builder(MainActivity.this);
        m.setTitle("Choose Your Language");

        m.setSingleChoiceItems(listItems, -1, new DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialog, int i) {
                String selectedLanguage;
                if (i == 0) {
                    selectedLanguage = "en"; // English
                } else if (i == 1) {
                    selectedLanguage = "ar"; // Arabic
                } else if (i == 2) {
                    selectedLanguage = "ta"; // Tamil
                } else if (i == 3) {
                    selectedLanguage = "te"; // Telugu
                } else {
                    return;
                }

                setLocale(selectedLanguage);
            }
        });
    }
}
```

```

recreate();
    dialog.dismiss();
}
});

AlertDialog mDialog = m.create();
mDialog.show();
}

private void setLocale(String lang) {
    Locale locale = new Locale(lang);
    Locale.setDefault(locale);

    Configuration config = new Configuration();
    config.locale = locale;

    getResources().updateConfiguration(config, getResources().getDisplayMetrics());

    SharedPreferences.Editor editor = getSharedPreferences("settings",
MODE_PRIVATE).edit();
    editor.putString("My Language", lang);
    editor.apply();

}

private void loadLocale() {
    SharedPreferences preferences = getSharedPreferences("settings",
Activity.MODE_PRIVATE);
    String lang = preferences.getString("My Language", "");
    setLocale(lang);
}
}

```

Strings.xml:

```

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

    <string name="app_name">ex10</string>
    <string name="regionallanguage">Regional Language</string>

    <string name="username">User Name</string>

```

```
<string name="password">Password</string>

<string name="login"> Login </string>
  <string name="changelanguage">Change Language</string>
  <string name="hint1">Enter your name</string>
  <string name="hint2">Enter your password</string>
</resources>
```

Strings.xml (ar):

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <string name="app_name">ex10</string>
  <string name="regionallanguage">>لغة محلية</string>
  <string name="username">>اسم المستخدم</string>
  <string name="password">>كلمة المرور</string>
  <string name="login">>تسجيل الدخول</string>
  <string name="changelanguage">>تغيير اللغة</string>
  <string name="hint1">>أدخل أسمك</string>
  <string name="hint2">>ادخل رقمك السري</string>
</resources>
```

Strings.xml (ta):

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <string name="app_name">ex10</string>
  <string name="regionallanguage">பிராந்திய மொழி</string>
  <string name="username">பயனர் பெயர்</string>
  <string name="password">கடவுச்சொல்</string>
  <string name="login">உள்ளுழைய</string>
  <string name="changelanguage">மொழி மாற்றம்</string>
  <string name="hint1">உங்கள் பெயரை உள்ளிடவும்</string>
  <string name="hint2">உங்கள் கடவுச்சொல்லை உள்ளிடவும்</string>
</resources>
```

Strings.xml (te):

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <string name="app_name">ex10</string>
```

<string name="regionallanguage">ప్రాంతీయ భాష</string>

<string name="username">వినియోగదారు పేరు</string>

<string name="password">పాస్ వర్డ్</string>

<string name="login">ప్రవేశించండి</string>

<string name="changelanguage">భాష మార్చు</string>

<string name="hint1">మీ పేరు రాయుము</string>

<string name="hint2">మీ పాస్ వర్డ్ ని నమోదుచేయండి</string>

</resources>

STEP 4: Add Internet Permission

In **AndroidManifest.xml**, add:

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

STEP 5: Add Layout Code

In **res/layout/activity_main.xml**:

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    android:padding="16dp">

    <Button
        android:id="@+id/selectBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Select Image"/>

    <Button
        android:id="@+id/uploadBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Upload Image"
        android:layout_marginTop="16dp"/>

</LinearLayout>
```

STEP 6: Java Code to Upload Image

In **MainActivity.java**:

```
package com.example.cloudstorageapp;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
```

```
import android.widget.Button;
import android.widget.Toast;
import androidx.annotation.Nullable;
import androidx.appcompat.app.AppCompatActivity;

import com.google.firebase.storage.FirebaseStorage;
import com.google.firebase.storage.StorageReference;
import com.google.firebase.storage.UploadTask;

public class MainActivity extends AppCompatActivity {

    Button selectBtn, uploadBtn;
    Uri imageUri;
    FirebaseStorage storage;
    StorageReference storageRef;

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

        selectBtn = findViewById(R.id.selectBtn);
        uploadBtn = findViewById(R.id.uploadBtn);

        storage = FirebaseStorage.getInstance();
        storageRef = storage.getReference();

        selectBtn.setOnClickListener(v -> selectImage());
        uploadBtn.setOnClickListener(v -> uploadImage());
    }

    private void selectImage() {
        Intent intent = new Intent();
        intent.setType("image/*");
        intent.setAction(Intent.ACTION_GET_CONTENT);
        startActivityForResult(intent, 101);
    }

    @Override
    protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {
        super.onActivityResult(requestCode, resultCode, data);

        if (requestCode == 101 && resultCode == RESULT_OK && data != null) {
            imageUri = data.getData();
        }
    }
}
```

```
        Toast.makeText(this, "Image Selected", Toast.LENGTH_SHORT).show();
    }
}

private void uploadImage() {
    if (imageUri != null) {
        StorageReference imgRef = storageRef.child("images/" +
System.currentTimeMillis() + ".jpg");
        UploadTask uploadTask = imgRef.putFile(imageUri);

        uploadTask.addOnSuccessListener(taskSnapshot ->
            Toast.makeText(MainActivity.this, "Upload Successful",
Toast.LENGTH_SHORT).show()
        ).addOnFailureListener(e ->
            Toast.makeText(MainActivity.this, "Upload Failed",
Toast.LENGTH_SHORT).show()
        );
    } else {
        Toast.makeText(this, "Select an image first", Toast.LENGTH_SHORT).show();
    }
}
}
```