**Aim:** Program to Design User Login form.

**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">

    <EditText

        android:id="@+id/editTextText"

        android:layout\_width="wrap\_content"

        android:layout\_height="wrap\_content"

        android:layout\_marginStart="76dp"

        android:layout\_marginTop="188dp"

        android:layout\_marginEnd="12dp"

        android:ems="10"

        android:inputType="text"

        app:layout\_constraintEnd\_toEndOf="parent"

        app:layout\_constraintHorizontal\_bias="1.0"

        app:layout\_constraintStart\_toEndOf="@id/textView"

        app:layout\_constraintTop\_toTopOf="parent" />

    <EditText

        android:id="@+id/editTextTextPassword"

        android:layout\_width="wrap\_content"

        android:layout\_height="wrap\_content"

        android:layout\_marginStart="76dp"

        android:layout\_marginTop="37dp"

        android:ems="10"

        android:inputType="textPassword"

        app:layout\_constraintStart\_toEndOf="@id/textView2"

        app:layout\_constraintTop\_toBottomOf="@+id/editTextText" />

    <TextView

        android:id="@+id/textView"

        android:layout\_width="84dp"

        android:layout\_height="48dp"

        android:layout\_marginStart="32dp"

        android:layout\_marginTop="188dp"

        android:gravity="center"

        android:text="username"

        app:layout\_constraintStart\_toStartOf="parent"

        app:layout\_constraintTop\_toTopOf="parent" />

    <TextView

        android:id="@+id/textView2"

        android:layout\_width="82dp"

        android:layout\_height="48dp"

        android:layout\_marginStart="32dp"

        android:layout\_marginTop="34dp"

        android:gravity="center"

        android:text="password"

        app:layout\_constraintStart\_toStartOf="parent"

        app:layout\_constraintTop\_toBottomOf="@+id/textView" />

    <Button

        android:id="@+id/button"

        android:layout\_width="wrap\_content"

        android:layout\_height="wrap\_content"

        android:layout\_marginStart="190dp"

        android:layout\_marginTop="56dp"

        android:text="Button"

        app:layout\_constraintStart\_toStartOf="parent"

        app:layout\_constraintTop\_toBottomOf="@id/editTextTextPassword" />

    <TextView

        android:id="@+id/textView3"

        android:layout\_width="wrap\_content"

        android:layout\_height="wrap\_content"

        android:layout\_marginStart="205dp"

        android:layout\_marginTop="44dp"

        android:text="TextView"

        android:visibility="gone"

        app:layout\_constraintStart\_toStartOf="parent"

        app:layout\_constraintTop\_toBottomOf="@+id/button"

        tools:visibility="visible" />

</androidx.constraintlayout.widget.ConstraintLayout>

Program to Display message in Edit text on button press.

**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">  
  
 <EditText  
 android:id="@+id/editTextText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="76dp"  
 android:layout\_marginTop="188dp"  
 android:ems="10"  
 android:hint="Enter text"  
 android:inputType="text"  
 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="190dp"  
 android:layout\_marginTop="56dp"  
 android:text="Submit"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/editTextText" />  
  
 <TextView  
 android:id="@+id/textView3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="205dp"  
 android:layout\_marginTop="44dp"  
 android:text=""  
 android:visibility="gone"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication  
import android.os.Bundle  
import android.view.View  
import androidx.appcompat.app.AppCompatActivity  
import android.widget.Button  
import android.widget.EditText  
import android.widget.TextView  
  
class MainActivity : AppCompatActivity() {  
  
 private lateinit var input: EditText  
 private lateinit var submit: Button  
 private lateinit var output: TextView  
  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)

input = findViewById(R.id.*editTextText*)  
 submit = findViewById(R.id.*button*)  
 output = findViewById(R.id.*textView3*)  
  
 submit.setOnClickListener **{** val text = input.*text*.toString()  
 if (text.*isNotEmpty*()) {  
 output.*visibility* = View.*VISIBLE* output.*text* = "Hello, $text!"  
 } else {  
 output.*visibility* = View.*VISIBLE* output.*text* = "Please enter some text."  
 }  
 **}** }  
}

**Aim:** Program to Check the given number in the Edit Text, is prime or not.

**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">  
  
 <EditText  
 android:id="@+id/editTextText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="76dp"  
 android:layout\_marginTop="188dp"  
 android:ems="10"  
 android:hint="Enter text"  
 android:inputType="text"  
 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="190dp"  
 android:layout\_marginTop="56dp"  
 android:text="Submit"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/editTextText" />  
  
 <TextView  
 android:id="@+id/textView3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="205dp"  
 android:layout\_marginTop="44dp"  
 android:text=""  
 android:visibility="gone"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication  
  
import android.os.Bundle  
import android.view.View  
import androidx.appcompat.app.AppCompatActivity  
import android.widget.Button  
import android.widget.EditText  
import android.widget.TextView  
  
class MainActivity : AppCompatActivity() {  
  
 private lateinit var input: EditText  
 private lateinit var submit: Button  
 private lateinit var output: TextView  
  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)  
  
 input = findViewById(R.id.*editTextText*)  
 submit = findViewById(R.id.*button*)  
 output = findViewById(R.id.*textView3*)  
  
 submit.setOnClickListener **{** val numberText = input.*text*.toString()  
  
 if (numberText.*isNotEmpty*()) {  
 val number = numberText.*toIntOrNull*()  
 if (number != null) {  
 if (isPrime(number)) {  
 output.*text* = "$number is a prime number."  
 } else {  
 output.*text* = "$number is not a prime number."  
 }  
 } else {  
 output.*text* = "Please enter a valid number."  
 }  
 } else {  
 output.*text* = "Input cannot be empty."  
 }  
 output.*visibility* = View.*VISIBLE* **}** }  
  
 private fun isPrime(num: Int): Boolean {  
 if (num <= 1) return false  
 for (i in 2..Math.sqrt(num.toDouble()).toInt()) {  
 if (num % i == 0) return false  
 }  
 return true  
 }  
}

**Aim:** Program to demonstrate Toast.

**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">  
  
 <Button  
 android:id="@+id/button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="190dp"  
 android:layout\_marginTop="56dp"  
 android:text="Submit"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/editTextText" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication  
  
import android.os.Bundle  
import android.widget.Button  
import android.widget.EditText  
import android.widget.Toast  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {   
 private lateinit var submit: Button

override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)  
 submit = findViewById(R.id.*button*)  
  
 submit.setOnClickListener **{**  
 Toast.makeText(this, "Button clicked", Toast.*LENGTH\_SHORT*).show()  
 }  
 **}** }  
}

**Aim:** Program to add two numbers and display the result.

**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">  
  
 <EditText  
 android:id="@+id/num1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="76dp"  
 android:layout\_marginTop="100dp"  
 android:ems="10"  
 android:hint="Enter first number"  
 android:inputType="number"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <EditText  
 android:id="@+id/num2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="76dp"  
 android:layout\_marginTop="16dp"  
 android:ems="10"  
 android:hint="Enter second number"  
 android:inputType="number"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/num1" />  
  
 <Button  
 android:id="@+id/button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="190dp"  
 android:layout\_marginTop="24dp"  
 android:text="Add"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/num2" />  
  
 <TextView  
 android:id="@+id/result"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="76dp"  
 android:layout\_marginTop="16dp"  
 android:text="Result:"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@id/button" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication

import android.os.Bundle

import android.widget.Button

import android.widget.EditText

import android.widget.TextView

import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

private lateinit var num1: EditText

private lateinit var num2: EditText

private lateinit var button: Button

private lateinit var result: TextView

override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.activity\_main)

num1 = findViewById(R.id.num1)

num2 = findViewById(R.id.num2)

button = findViewById(R.id.button)

result = findViewById(R.id.result)

button.setOnClickListener {

val number1 = num1.text.toString().toDoubleOrNull()

val number2 = num2.text.toString().toDoubleOrNull()

if (number1 != null && number2 != null) {

val sum = number1 + number2

result.text = "Result: $sum"

} else {

result.text = "Please enter valid numbers"

}

}

}

}

**Aim:** Program to perform simple calculator using Linear Layout.

**activity\_main.xml**

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

<LinearLayout

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

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="16dp">

<EditText

android:id="@+id/num1"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter first number"

android:inputType="numberDecimal" />

<EditText

android:id="@+id/num2"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter second number"

android:inputType="numberDecimal"

android:layout\_marginTop="8dp" />

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="horizontal"

android:layout\_marginTop="16dp">

<Button

android:id="@+id/add"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="Add" />

<Button

android:id="@+id/subtract"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="Subtract" />

<Button

android:id="@+id/multiply"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="Multiply" />

<Button

android:id="@+id/divide"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:text="Divide" />

</LinearLayout>

<TextView

android:id="@+id/result"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Result:"

android:textSize="18sp"

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

</LinearLayout>

# MainActivity.kt

package com.example.myapplication

# import android.os.Bundle import android.widget.Button import android.widget.EditText import android.widget.TextView import android.widget.Toast import androidx.appcompat.app.AppCompatActivity class MainActivity : AppCompatActivity() { private lateinit var num1: EditText private lateinit var num2: EditText private lateinit var add: Button private lateinit var subtract: Button private lateinit var multiply: Button private lateinit var divide: Button private lateinit var result: TextView override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.*activity\_main*) num1 = findViewById(R.id.*num1*) num2 = findViewById(R.id.*num2*) add = findViewById(R.id.*add*) subtract = findViewById(R.id.*subtract*) multiply = findViewById(R.id.*multiply*) divide = findViewById(R.id.*divide*) result = findViewById(R.id.*result*) add.setOnClickListener { calculate("+") } subtract.setOnClickListener { calculate("-") } multiply.setOnClickListener { calculate("\*") } divide.setOnClickListener { calculate("/") } } private fun calculate(operation: String) { val number1 = num1.*text*.toString().*toDoubleOrNull*() val number2 = num2.*text*.toString().*toDoubleOrNull*() if (number1 == null || number2 == null) { Toast.makeText(this, "Please enter valid numbers", Toast.*LENGTH\_SHORT*).show() return } val resultText = when (operation) { "+" -> "Result: ${number1 + number2}" "-" -> "Result: ${number1 - number2}" "\*" -> "Result: ${number1 \* number2}" "/" -> if (number2 != 0.0) "Result: ${number1 / number2}" else "Cannot divide by zero" else -> "Invalid Operation" } result.*text* = resultText } }

**Aim:** Program to Load an Image in ImageView.

**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">  
  
 <ImageView  
 android:id="@+id/imageView"  
 android:layout\_width="200dp"  
 android:layout\_height="200dp"  
 android:src="@drawable/Tea"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication  
import android.os.Bundle  
import android.widget.ImageView  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {  
  
 private lateinit var imageView: ImageView  
  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)  
  
 imageView = findViewById(R.id.*imageView*)  
 imageView.setImageResource(R.drawable.*Tea*)  
 }  
}

**Aim:** Program to move an Image from one ImageView to another ImageView on button press.

# Procedure:

**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">

<ImageView

android:id="@+id/imageView1"

android:layout\_width="200dp"

android:layout\_height="200dp"

android:src="@drawable/johnwick"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<ImageView

android:id="@+id/imageView2"

android:layout\_width="200dp"

android:layout\_height="200dp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<Button

android:id="@+id/moveButton"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Move Image"

app:layout\_constraintTop\_toBottomOf="@id/imageView2"

app:layout\_constraintStart\_toStartOf="parent"

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

</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication  
import android.os.Bundle  
import android.widget.Button  
import android.widget.ImageView  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {  
  
 private lateinit var imageView1: ImageView  
 private lateinit var imageView2: ImageView  
 private lateinit var moveButton: Button  
 private var k = 0  
  
 override fun onCreate(savedInstanceState: Bundle?) {

# super.onCreate(savedInstanceState)

# setContentView(R.layout.activity\_main)

imageView1 = findViewById(R.id.*imageView1*)  
 imageView2 = findViewById(R.id.*imageView2*)  
 moveButton = findViewById(R.id.*moveButton*)  
  
 moveButton.setOnClickListener **{** if (k == 0) {  
 imageView2.setImageDrawable(imageView1.*drawable*)  
 imageView1.setImageDrawable(null)  
 k = 1  
 } else {  
 imageView1.setImageDrawable(imageView2.*drawable*)  
 imageView2.setImageDrawable(null)  
 k = 0  
 }  
 }  
 }

**Aim:** Create a simple list view to list our former presidents.

**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">

<ListView

android:id="@+id/presidentListView"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

app:layout\_constraintTop\_toTopOf="parent"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintStart\_toStartOf="parent"

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

</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

# package com.example.myapplication

# import android.os.Bundle

# import android.widget.ArrayAdapter

# import android.widget.ListView

# import androidx.appcompat.app.AppCompatActivity

# class MainActivity : AppCompatActivity() {

# private lateinit var presidentListView: ListView

# override fun onCreate(savedInstanceState: Bundle?) {

# super.onCreate(savedInstanceState)

# setContentView(R.layout.activity\_main)

# presidentListView = findViewById(R.id.presidentListView)

# val presidents = listOf(

# "Dr. Rajendra Prasad", "Dr. Sarvepalli Radhakrishnan", "Dr. Zakir Husain",

# "V. V. Giri", "Fakhruddin Ali Ahmed", "Neelam Sanjiva Reddy",

# "Giani Zail Singh", "R. Venkataraman", Dr. Shankar Dayal Sharma",

# "K. R. Narayanan", "Dr. A. P. J. Abdul Kalam", "Pratibha Patil",

# "Pranab Mukherjee", "Ram Nath Kovind")

# val adapter = ArrayAdapter(this, android.R.layout.simple\_list\_item\_1, presidents)

# presidentListView.adapter = adapter

# }

# }

**Aim:** Develop an application that draws basic graphical primitives on the screen.

# Procedure:

**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/ovalTextView"  
 android:layout\_width="300dp"  
 android:layout\_height="200dp"  
 android:text="Oval"  
 android:textColor="#FFFFFF"  
 android:gravity="center"  
 android:background="@drawable/oval\_shape"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

# oval\_shape.xml

<?xml version="1.0" encoding="utf-8"?>  
<shape xmlns:android="http://schemas.android.com/apk/res/android">  
 <solid android:color="#FF0000"/>   
 <corners android:radius="100dp"/>   
</shape>

**Aim:** Create a Custom List view that contains list of students with their name, place and photo.

# Procedure:

**custom\_list.xml**

# <?xml version="1.0" encoding="utf-8"?> <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:orientation="horizontal" android:padding="10dp"> <ImageView android:id="@+id/icon" android:layout\_width="50dp" android:layout\_height="50dp" android:src="@mipmap/ic\_launcher" /> <LinearLayout android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:layout\_marginLeft="10dp" android:orientation="vertical"> <TextView android:id="@+id/title" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:text="Title" android:textStyle="bold" android:textSize="18sp" /> <TextView android:id="@+id/description" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:text="Description" android:textSize="16sp" /> </LinearLayout> </LinearLayout>

# activity\_main.xml

<?xml version="1.0" encoding="utf-8"?>  
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
 <ListView  
 android:id="@+id/listView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent" />  
</RelativeLayout>

# MainActivity.kt

# package com.example.myapplication

# import android.os.Bundle

# import android.widget.ListView

# import android.widget.Toast

# import androidx.appcompat.app.AppCompatActivity

# class MainActivity : AppCompatActivity() {

# private val names = arrayOf("Tom", "Tobey", "Andrew")

# private val places = arrayOf("USA", "Canada", "UK")

# private val imageId = arrayOf(.drawable.tom, R.drawable.tobey,

# R.drawable.andrew)

# override fun onCreate(savedInstanceState: Bundle?) {

# super.onCreate(savedInstanceState)

# setContentView(R.layout.activity\_main)

# val listView = findViewById<ListView>(R.id.listView)

# val myListAdapter = MyListAdapter(this, names, places, imageId)

# listView.adapter = myListAdapter

# listView.setOnItemClickListener { \_, \_, position, \_ ->

# val selectedName = names[position]

# val selectedPlace = places[position]

# Toast.makeText(

# this, "Clicked on $selectedName from $selectedPlace at position

# $position", Toast.LENGTH\_LONG).show()

# }

# }

# }

# MyListAdapter.kt

package com.example.myapplication

import android.app.Activity

import android.view.LayoutInflater

import android.view.View

import android.view.ViewGroup

import android.widget.ArrayAdapter

import android.widget.ImageView

import android.widget.TextView

class MyListAdapter(

private val context: Activity,

private val title: Array<String>,

private val description: Array<String>,

private val imgid: Array<Int>) :

ArrayAdapter<String>(context, R.layout.custom\_list, title) {

override fun getView(position: Int, convertView: View?, parent: ViewGroup):View{

val inflater = context.layoutInflater

val rowView = convertView ?: inflater.inflate(R.layout.custom\_list, parent, false)

val titleText = rowView.findViewById<TextView>(R.id.title)

val imageView = rowView.findViewById<ImageView>(R.id.icon)

val subtitleText = rowView.findViewById<TextView>(R.id.description)

titleText.text = title[position]

imageView.setImageResource(imgid[position])

subtitleText.text = description[position]

return rowView

}

}

**Aim:** Create an application to make calls to your friends contact number.

# Procedure:

**AndroidManifest.xml**

<uses-feature android:name="android.hardware.telephony" android:required="false" />

<uses-permission android:name="android.permission.CALL\_PHONE" />

# activity\_main.xml

# <?xml version="1.0" encoding="utf-8"?> <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android" android:layout\_width="match\_parent" android:layout\_height="match\_parent" android:orientation="vertical" android:padding="16dp" android:gravity="center"> <EditText android:id="@+id/phoneNumberEditText" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Enter phone number" android:inputType="phone" android:maxLength="15" android:padding="10dp" /> <Button android:id="@+id/callButton" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:text="Call Friend" android:layout\_marginTop="20dp" /> </LinearLayout>

# MainActivity.kt

package com.example.myapplication

import android.Manifest

import android.content.Intent

import android.content.pm.PackageManager

import android.net.Uri

import android.os.Bundle

import android.view.View

import android.widget.EditText

import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity

import androidx.core.app.ActivityCompat

import androidx.core.content.ContextCompat

class MainActivity : AppCompatActivity() {

private val CALL\_PHONE\_PERMISSION = 1

override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.activity\_main)

val callButton = findViewById<View>(R.id.callButton)

callButton.setOnClickListener {

val phoneNumberEditText = findViewById<EditText>(R.id.phoneNumberEditText)

val phoneNumber = phoneNumberEditText.text.toString()

if (phoneNumber.isNotEmpty()) {

checkPermissionAndCall(phoneNumber)

} else {

Toast.makeText(this, "Please enter a valid phone number", Toast.LENGTH\_SHORT).show()

}

}

}

private fun checkPermissionAndCall(phoneNumber: String) {

if (ContextCompat.checkSelfPermission(this, Manifest.permission.CALL\_PHONE) == PackageManager.PERMISSION\_GRANTED) {

makePhoneCall(phoneNumber)

} else {

ActivityCompat.requestPermissions(

this, arrayOf(Manifest.permission.CALL\_PHONE), CALL\_PHONE\_PERMISSION

)

}

}

private fun makePhoneCall(phoneNumber: String) {

val intent = Intent(Intent.ACTION\_CALL)

intent.data = Uri.parse("tel:$phoneNumber")

try {

startActivity(intent)

} catch (e: SecurityException) {

Toast.makeText(this, "Permission denied: Unable to make the call", Toast.LENGTH\_SHORT).show()

}

}

**Aim:** Create the Application to play the Audio and Video clips.

# Procedure:

**activity\_main.xml**

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

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

# android:layout\_width="match\_parent"

# android:layout\_height="match\_parent"

# android:orientation="vertical"

# android:padding="16dp"

# android:gravity="center">

# <Button

# android:id="@+id/playAudioButton"

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

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

# android:text="Play Audio" />

# <Button

# android:id="@+id/stopAudioButton"

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

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

# android:text="Stop Audio"

# android:layout\_marginTop="10dp" />

# <Button

# android:id="@+id/playVideoButton"

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

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

# android:text="Play Video"

# android:layout\_marginTop="20dp" />

# <Button

# android:id="@+id/stopVideoButton"

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

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

# android:text="Stop Video"

# android:layout\_marginTop="10dp" />

# <VideoView

# android:id="@+id/videoView"

# android:layout\_width="match\_parent"

# android:layout\_height="250dp"

# android:visibility="gone"

# android:layout\_marginTop="20dp" />

# </LinearLayout>

# MainActivity.kt

package com.example.myapplication  
import android.media.MediaPlayer  
import android.net.Uri  
import android.os.Bundle  
import android.widget.Button  
import android.widget.Toast  
import android.widget.VideoView  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {  
  
 private lateinit var playAudioButton: Button  
 private lateinit var stopAudioButton: Button  
 private lateinit var playVideoButton: Button  
 private lateinit var stopVideoButton: Button  
 private lateinit var videoView: VideoView  
 private var mediaPlayer: MediaPlayer? = null  
  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.activity\_main)  
 playAudioButton = findViewById(R.id.playAudioButton)  
 stopAudioButton = findViewById(R.id.stopAudioButton)  
 playVideoButton = findViewById(R.id.playVideoButton)  
 stopVideoButton = findViewById(R.id.stopVideoButton)  
 videoView = findViewById(R.id.videoView)  
  
 playAudioButton.setOnClickListener **{** playAudio()  
 **}** stopAudioButton.setOnClickListener **{** stopAudio()  
 **}** playVideoButton.setOnClickListener **{** playVideo()  
 **}** stopVideoButton.setOnClickListener **{** stopVideo()  
 **}** }  
  
 private fun playAudio() {  
 val audioUri = Uri.parse("android.resource://${*packageName*}/raw/supra")  
 mediaPlayer = MediaPlayer.create(this, audioUri)  
 mediaPlayer?.start()  
 Toast.makeText(this, "Audio is playing", Toast.*LENGTH\_SHORT*).show()  
 }  
  
 private fun stopAudio() {  
 mediaPlayer?.stop()  
 mediaPlayer?.release()  
 mediaPlayer = null  
 Toast.makeText(this, "Audio stopped", Toast.*LENGTH\_SHORT*).show()  
 }  
  
 private fun playVideo() {  
 val videoUri = Uri.parse("android.resource://${*packageName*}/raw/nissan")  
 videoView.setVideoURI(videoUri)  
 videoView.*visibility* = VideoView.*VISIBLE* videoView.start()  
 Toast.makeText(this, "Video is playing", Toast.*LENGTH\_SHORT*).show()  
 }  
  
 private fun stopVideo() {  
 videoView.stopPlayback()  
 videoView.*visibility* = VideoView.*GONE* Toast.makeText(this, "Video stopped", Toast.*LENGTH\_SHORT*).show()  
 }  
  
 override fun onPause() {  
 super.onPause()  
 mediaPlayer?.release()  
 }  
}

**Aim:** Create Application by Using Building Menus and Storing Data.

# Procedure:

**menu\_main.xml**

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

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

<item

android:id="@+id/action\_add" android:title="Add Name" />

<item

android:id="@+id/action\_view" android:title="View Names" />

</menu>

# activity\_main.xml

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

<LinearLayout xmlns:android="<http://schemas.android.com/apk/res/android>" android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:orientation="vertical" android:padding="16dp">

<androidx.appcompat.widget.Toolbar android:id="@+id/toolbar" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" />

<TextView android:id="@+id/tvData"

android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="Names will appear here" android:textSize="16sp" android:padding="10dp" />

</LinearLayout>

# DatabaseHelper.kt

package com.example.application16 import android.content.ContentValues import android.content.Context

import android.database.sqlite.SQLiteDatabase import android.database.sqlite.SQLiteOpenHelper

class DatabaseHelper(context: Context) : SQLiteOpenHelper(context, DATABASE\_NAME, null, DATABASE\_VERSION) {

companion object {

const val DATABASE\_NAME = "NamesDatabase" const val DATABASE\_VERSION = 1

const val TABLE\_NAME = "Names" const val COLUMN\_ID = "id"

const val COLUMN\_NAME = "name"

}

override fun onCreate(db: SQLiteDatabase?) {

val createTableQuery = "CREATE TABLE $TABLE\_NAME ($COLUMN\_ID INTEGER PRIMARY KEY AUTOINCREMENT,

$COLUMN\_NAME TEXT)"

db?.execSQL(createTableQuery)

}

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

db?.execSQL("DROP TABLE IF EXISTS $TABLE\_NAME")

onCreate(db)

}

fun addName(name: String): Long { if (name.isBlank()) {

throw IllegalArgumentException("Name cannot be empty or blank")

}

val db = writableDatabase

val values = ContentValues().apply { put(COLUMN\_NAME, name)

}

return db.insert(TABLE\_NAME, null, values)

}

fun getAllNames(): List<String> {

val names = mutableListOf<String>() val db = readableDatabase

val cursor = db.rawQuery("SELECT \* FROM $TABLE\_NAME", null)

if (cursor.moveToFirst()) { do {

val name = cursor.getString(cursor.getColumnIndexOrThrow(COLUMN\_NAME))

names.add(name)

} while (cursor.moveToNext())

}

cursor.close() return names

}

}

# MainActivity.kt

package com.example.application16 import android.os.Bundle

import android.util.Log import android.view.Menu

import android.view.MenuItem import android.widget.EditText import android.widget.TextView import android.widget.Toast

import androidx.appcompat.app.AlertDialog

import androidx.appcompat.app.AppCompatActivity import androidx.appcompat.widget.Toolbar

import com.example.application16.DatabaseHelper

class MainActivity : AppCompatActivity() {

private lateinit var databaseHelper: DatabaseHelper private lateinit var tvData: TextView

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.activity\_main)

val toolbar: Toolbar = findViewById(R.id.toolbar) setSupportActionBar(toolbar) supportActionBar?.title = "Database App"

tvData = findViewById(R.id.tvData) databaseHelper = DatabaseHelper(this)

}

override fun onCreateOptionsMenu(menu: Menu?): Boolean { menuInflater.inflate(R.menu.menu\_main, menu)

return true

}

override fun onOptionsItemSelected(item: MenuItem): Boolean { when (item.itemId) {

R.id.action\_add -> { showAddNameDialog() return true

}

R.id.action\_view -> { showNames() return true

}

}

return super.onOptionsItemSelected(item)

}

private fun showAddNameDialog() {

val builder = AlertDialog.Builder(this) builder.setTitle("Add Name")

val input = EditText(this) input.hint = "Enter name" builder.setView(input)

builder.setPositiveButton("Add") { \_, \_ -> val name = input.text.toString()

try {

if (name.isNotEmpty()) {

val result = databaseHelper.addName(name) if (result > 0) {

Toast.makeText(this, "Name added successfully!", Toast.LENGTH\_SHORT).show()

} else {

Toast.makeText(this, "Failed to add name.", Toast.LENGTH\_SHORT).show()

}

} else {

Toast.makeText(this, "Name cannot be empty!", Toast.LENGTH\_SHORT).show()

}

} catch (e: Exception) {

Log.e("MainActivity", "Error adding name: ${e.message}") Toast.makeText(this, "An error occurred: ${e.message}",

Toast.LENGTH\_SHORT).show()

}

}

builder.setNegativeButton("Cancel", null) builder.show()

}

private fun showNames() {

val names = databaseHelper.getAllNames() if (names.isEmpty()) {

tvData.text = "No names found!"

} else {

tvData.text = names.joinToString("\n")

}

}

}

**Aim:** Design the Application for Menus and Action Bar.

# Procedure:

**menu\_main.xml**

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

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

<item

android:id="@+id/action\_search" android:title="Search" android:showAsAction="ifRoom"/>

<item

android:id="@+id/action\_settings" android:title="Settings" android:showAsAction="ifRoom"/>

<item

android:id="@+id/action\_help" android:title="Help" android:showAsAction="never"/>

</menu>

# activity\_main.xml

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

<androidx.coordinatorlayout.widget.CoordinatorLayout

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

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

<androidx.appcompat.widget.Toolbar android:id="@+id/toolbar" android:layout\_width="match\_parent" android:layout\_height="?attr/actionBarSize" android:background="?attr/colorPrimary" android:title="My App" android:titleTextColor="@android:color/white" android:elevation="4dp"/>

<androidx.fragment.app.FragmentContainerView android:id="@+id/fragment\_container" android:layout\_width="match\_parent" android:layout\_height="match\_parent"/>

</androidx.coordinatorlayout.widget.CoordinatorLayout>

# MainActivity.kt

package com.example.myapplication

import android.os.Bundle

import android.view.Menu

import android.view.MenuItem

import androidx.appcompat.app.AppCompatActivity import androidx.appcompat.widget.Toolbar

import com.google.android.material.snackbar.Snackbar

class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.activity\_main)

val toolbar: Toolbar = findViewById(R.id.toolbar) setSupportActionBar(toolbar)

}

override fun onCreateOptionsMenu(menu: Menu?): Boolean {

menuInflater.inflate(R.menu.menu\_main, menu) return true

}

override fun onOptionsItemSelected(item: MenuItem): Boolean { return when (item.itemId) {

R.id.action\_search -> {

showMessage("Search selected") true

}

R.id.action\_settings -> {

showMessage("Settings selected") true

}

R.id.action\_help -> {

showMessage("Help selected") true

}

else -> super.onOptionsItemSelected(item)

}

}

private fun showMessage(message: String) { Snackbar.make(findViewById(android.R.id.content), message,

Snackbar.LENGTH\_SHORT).show()

}

}

**Aim:** Program to Select an item from the list and display in Label.

# Procedure:

**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/heading"

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

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

# android:text="Cars List"

# android:textSize="24sp"

# android:textStyle="bold"

# android:padding="16dp"

# app:layout\_constraintStart\_toStartOf="parent"

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

# <TextView

# android:id="@+id/selectedItem"

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

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

# android:text="Selected Car: None"

# android:textSize="18sp"

# android:padding="16dp"

# app:layout\_constraintTop\_toBottomOf="@id/heading"

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

# <ListView

# android:layout\_width="0dp"

# android:layout\_height="0dp"

# android:id="@+id/listV"

# app:layout\_constraintTop\_toBottomOf="@id/selectedItem"

# app:layout\_constraintBottom\_toBottomOf="parent"

# app:layout\_constraintStart\_toStartOf="parent"

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

# </androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication  
import android.os.Bundle  
import android.widget.AdapterView  
import android.widget.ArrayAdapter  
import android.widget.ListView  
import android.widget.TextView  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)

val lstview = findViewById<ListView>(R.id.*listV*)  
 val selectedLabel = findViewById<TextView>(R.id.*selectedItem*)  
 val items = listOf("Apple", "Banana", "Orange", "Mango", "Grapes", "Pineapple")  
 val arrayAdapter: ArrayAdapter<String> = ArrayAdapter(this,

android.R.layout.*simple\_list\_item\_1*, name)  
 lstview.*adapter* = arrayAdapter

lstview.*onItemClickListener* = AdapterView.OnItemClickListener **{** adapterView,

view, position, id **->**selectedLabel.*text* = "Selected Car: ${name[position]}"  
 }}  
}

**Date: 16-10-2024**

# Experiment No. 17

**Aim:** Program to perform all arithmetic operations with Menu.

**CO4:** Design and build a functional Android application

# Procedure:

**menu.xml**

<?xml version="1.0" encoding="utf-8"?>  
<menu xmlns:android="http://schemas.android.com/apk/res/android">  
 <item android:id="@+id/add" android:title="Add" />  
 <item android:id="@+id/subtract" android:title="Subtract" />  
 <item android:id="@+id/multiply" android:title="Multiply" />  
 <item android:id="@+id/divide" android:title="Divide" />  
</menu>

# 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/linearLayout"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center">

<EditText  
 android:id="@+id/number1"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="275dp"  
 android:hint="Enter number"  
 android:inputType="numberDecimal"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="@+id/number2"  
 app:layout\_constraintTop\_toTopOf="parent" />

<EditText  
 android:id="@+id/number2"  
 android:layout\_width="379dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:hint="Enter number"  
 android:inputType="numberDecimal"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/number1" />

<ImageButton  
 android:id="@+id/iButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:contentDescription="Arithmetic operations"  
 android:src="@android:drawable/ic\_menu\_add"  
 app:layout\_constraintEnd\_toEndOf="@+id/number2"  
 app:layout\_constraintStart\_toStartOf="@+id/number2"  
 app:layout\_constraintTop\_toBottomOf="@+id/number2" />

<TextView  
 android:id="@+id/resultText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="212dp"  
 android:text="Result: "  
 android:textSize="18sp"  
 app:layout\_constraintEnd\_toEndOf="@+id/iButton"  
 app:layout\_constraintTop\_toBottomOf="@+id/iButton" />

<TextView  
 android:id="@+id/textView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="100dp"  
 android:layout\_marginTop="78dp"  
 android:layout\_marginEnd="74dp"  
 android:layout\_marginBottom="621dp"  
 android:text="Arithmetic Operations"  
 android:textSize="24sp"  
 android:textStyle="bold"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>

# MainActivity.kt

package com.example.myapplication

import android.os.Bundle

import android.view.MenuInflater

import android.view.MenuItem

import android.widget.EditText

import android.widget.ImageButton

import android.widget.PopupMenu

import android.widget.TextView

import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.activity\_main)

val number1EditText: EditText = findViewById(R.id.number1)

val number2EditText: EditText = findViewById(R.id.number2)

val resultTextView: TextView = findViewById(R.id.resultText)

findViewById<ImageButton>(R.id.iButton).setOnClickListener { view ->

val popup = PopupMenu(this, view)

val inflater = popup.menuInflater

inflater.inflate(R.menu.menu, popup.menu)

popup.setOnMenuItemClickListener { menuItem: MenuItem ->

val num1 = number1EditText.text.toString().toDoubleOrNull()

val num2 = number2EditText.text.toString().toDoubleOrNull()

if (num1 == null || num2 == null) {

Toast.makeText(this, "Please enter valid numbers",

Toast.LENGTH\_SHORT).show()

return@setOnMenuItemClickListener false

}

when (menuItem.itemId) {

R.id.add -> {

val result = num1 + num2

resultTextView.text = "Result: $result"

true

}

R.id.subtract -> {

val result = num1 - num2

resultTextView.text = "Result: $result"

true

}

R.id.multiply -> {

val result = num1 \* num2

resultTextView.text = "Result: $result"

true

}

R.id.divide -> {

if (num2 == 0.0) {

Toast.makeText(this, "Cannot divide by zero",

Toast.LENGTH\_SHORT).show()

} else {

val result = num1 / num2

resultTextView.text = "Result: $result"

}

true

}

else -> false

}

}

popup.show()

}

}

}

**Aim:** Program to Demonstrate Implicit and Explicit Intent.

# Procedure:

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center">  
  
 <Button  
 android:id="@+id/btnOpenSecondActivity"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Open Second Activity"  
 android:layout\_centerInParent="true" />  
</RelativeLayout>

# MainActivity.kt

package com.example.myapplication  
import android.content.Intent  
import android.os.Bundle  
import android.widget.Button  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {  
override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)  
 val btnOpenSecondActivity = findViewById<Button>(R.id.*btnOpenSecondActivity*)  
 btnOpenSecondActivity.setOnClickListener **{** val intent = Intent(this, MainActivity2::class.*java*)  
 intent.putExtra("EXTRA\_MESSAGE", "Hello from MainActivity")  
 startActivity(intent)  
 }}  
}

# 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:gravity="center"  
 android:padding="16dp">  
  
 <TextView  
 android:id="@+id/tvMessage"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Default Message"  
 android:textSize="18sp"  
 android:layout\_marginBottom="20dp" />  
  
 <Button  
 android:id="@+id/btnOpenWeb"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Open Web Page" />  
</LinearLayout>

**MainActivity2.kt**

package com.example.myapplication  
import android.content.Intent  
import android.net.Uri  
import android.os.Bundle  
import android.widget.Button  
import android.widget.TextView  
import android.widget.Toast  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity2 : AppCompatActivity() {  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main2*)  
 val tvMessage = findViewById<TextView>(R.id.*tvMessage*)  
 val btnOpenWeb = findViewById<Button>(R.id.*btnOpenWeb*)  
  
 val message = *intent*.getStringExtra("EXTRA\_MESSAGE")  
 tvMessage.*text* = message ?: "No message received"  
  
 btnOpenWeb.setOnClickListener **{** val webpage: Uri = Uri.parse("https://www.google.com")  
 val webIntent = Intent(Intent.*ACTION\_VIEW*, webpage).*apply* **{** addCategory(Intent.*CATEGORY\_BROWSABLE*)  
 addCategory(Intent.*CATEGORY\_DEFAULT*)  
 }try {  
 startActivity(webIntent)  
 } catch (e: Exception) {  
 Toast.makeText(this, "No application available to open the webpage", Toast.*LENGTH\_SHORT*).show()  
 }  
 }}  
}

**Aim:** Create Student Details App to read roll no, name and 3 marks, calculate total and store in DB.

**CO5:** Implement SQLite Database and content providers.

# Procedure:

**activity\_main.xml**

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

<androidx.coordinatorlayout.widget.CoordinatorLayout xmlns:android="<http://schemas.android.com/apk/res/android>" android:layout\_width="match\_parent" android:layout\_height="match\_parent">

<androidx.appcompat.widget.Toolbar android:id="@+id/toolbar" android:layout\_width="match\_parent" android:layout\_height="?attr/actionBarSize" android:elevation="4dp" />

<LinearLayout android:layout\_width="match\_parent" android:layout\_height="match\_parent" android:orientation="vertical" android:padding="16dp" android:layout\_marginTop="?attr/actionBarSize">

<LinearLayout xmlns:android="<http://schemas.android.com/apk/res/android>" android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:orientation="vertical">

</LinearLayout>

</LinearLayout>

</androidx.coordinatorlayout.widget.CoordinatorLayout>

# MainActivity.kt

package com.example.application22 import android.content.Intent import android.os.Bundle

import android.view.Menu import android.view.MenuItem

import androidx.appcompat.app.AppCompatActivity import androidx.appcompat.widget.Toolbar

class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.activity\_main)

// Set up the Toolbar

val toolbar: Toolbar = findViewById(R.id.toolbar) setSupportActionBar(toolbar) supportActionBar?.title = "Student Details App"

}

override fun onCreateOptionsMenu(menu: Menu?): Boolean { menuInflater.inflate(R.menu.menu\_main, menu)

return true

}

override fun onOptionsItemSelected(item: MenuItem): Boolean { when (item.itemId) {

R.id.action\_add\_student -> {

startActivity(Intent(this, AddStudentActivity::class.java)) return true

}

R.id.action\_view\_students -> {

startActivity(Intent(this, ViewStudentsActivity::class.java)) return true

}

}

return super.onOptionsItemSelected(item)

}

}

# activity\_add\_student.xml

<androidx.coordinatorlayout.widget.CoordinatorLayout xmlns:android="<http://schemas.android.com/apk/res/android>"

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

<androidx.appcompat.widget.Toolbar android:id="@+id/toolbar" android:layout\_width="match\_parent" android:layout\_height="?attr/actionBarSize" android:background="?attr/colorPrimary"

android:theme="@style/ThemeOverlay.AppCompat.Dark.ActionBar" android:elevation="4dp" />

<LinearLayout android:layout\_width="match\_parent"

android:layout\_height="match\_parent" android:orientation="vertical" android:padding="16dp" android:layout\_marginTop="?attr/actionBarSize">

<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">

<EditText android:id="@+id/etRollNo" android:hint="Roll Number" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" />

<EditText android:id="@+id/etName" android:hint="Name" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" />

<EditText android:id="@+id/etMark1" android:hint="Mark 1" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" />

<EditText android:id="@+id/etMark2" android:hint="Mark 2"

android:layout\_width="match\_parent" android:layout\_height="wrap\_content" />

<EditText android:id="@+id/etMark3" android:hint="Mark 3" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" />

<Button android:id="@+id/btnSave" android:text="Save" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" />

</LinearLayout>

</LinearLayout>

</androidx.coordinatorlayout.widget.CoordinatorLayout>

# activity\_view\_students.xml

<androidx.coordinatorlayout.widget.CoordinatorLayout xmlns:android="<http://schemas.android.com/apk/res/android>"

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

<androidx.appcompat.widget.Toolbar android:id="@+id/toolbar" android:layout\_width="match\_parent" android:layout\_height="?attr/actionBarSize" android:background="?attr/colorPrimary"

android:theme="@style/ThemeOverlay.AppCompat.Dark.ActionBar" android:elevation="4dp" />

<LinearLayout android:layout\_width="match\_parent" android:layout\_height="match\_parent" android:orientation="vertical" android:padding="16dp" android:layout\_marginTop="?attr/actionBarSize">

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

<TextView android:id="@+id/tvStudents" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:padding="16dp" android:textSize="16sp" />

</ScrollView>

</LinearLayout>

</androidx.coordinatorlayout.widget.CoordinatorLayout>

# menu\_main.xml

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

<item android:id="@+id/action\_add\_student" android:title="Add Student" android:showAsAction="never" />

<item android:id="@+id/action\_view\_students" android:title="View Students"

android:showAsAction="never" />

</menu>

# AddStudentActivity.kt

package com.example.application22 import android.os.Bundle

import android.widget.Button import android.widget.EditText import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity import androidx.appcompat.widget.Toolbar

class AddStudentActivity : AppCompatActivity() { private lateinit var databaseHelper: DatabaseHelper

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.activity\_add\_student)

// Set up the Toolbar

val toolbar: Toolbar = findViewById(R.id.toolbar) setSupportActionBar(toolbar) supportActionBar?.title = "Add Student"

supportActionBar?.setDisplayHomeAsUpEnabled(true)

databaseHelper = DatabaseHelper(this)

val etRollNo: EditText = findViewById(R.id.etRollNo) val etName: EditText = findViewById(R.id.etName)

val etMark1: EditText = findViewById(R.id.etMark1) val etMark2: EditText = findViewById(R.id.etMark2) val etMark3: EditText = findViewById(R.id.etMark3) val btnSave: Button = findViewById(R.id.btnSave)

btnSave.setOnClickListener {

val rollNo = etRollNo.text.toString().toIntOrNull() val name = etName.text.toString()

val mark1 = etMark1.text.toString().toIntOrNull() val mark2 = etMark2.text.toString().toIntOrNull() val mark3 = etMark3.text.toString().toIntOrNull()

if (rollNo != null && name.isNotEmpty() && mark1 != null && mark2

!= null && mark3 != null) {

val result = databaseHelper.addStudent(rollNo, name, mark1, mark2,

mark3)

if (result > 0) {

Toast.makeText(this, "Student added successfully!",

Toast.LENGTH\_SHORT).show()

finish()

} else {

Toast.makeText(this, "Error adding student.", Toast.LENGTH\_SHORT).show()

}

} else {

Toast.makeText(this, "Please fill all fields correctly.", Toast.LENGTH\_SHORT).show()

}

}

}

override fun onSupportNavigateUp(): Boolean { onBackPressed()

return true

}

}

# ViewStudentsActivity.kt

package com.example.application22 import android.os.Bundle

import android.widget.TextView import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity import androidx.appcompat.widget.Toolbar

class ViewStudentsActivity : AppCompatActivity() { private lateinit var databaseHelper: DatabaseHelper override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState) setContentView(R.layout.activity\_view\_students)

// Set up the Toolbar

val toolbar: Toolbar = findViewById(R.id.toolbar) setSupportActionBar(toolbar) supportActionBar?.title = "View Students"

supportActionBar?.setDisplayHomeAsUpEnabled(true) databaseHelper = DatabaseHelper(this)

val tvStudents: TextView = findViewById(R.id.tvStudents)

try {

val students = databaseHelper.getAllStudents() if (students.isEmpty()) {

tvStudents.text = "No students found."

} else {

val studentDetails = students.joinToString("\n") { student ->

"Roll No: ${student["roll\_no"]}, Name: ${student["name"]}, Total:

${student["total"]}"

}

tvStudents.text = studentDetails

}

} catch (e: Exception) {

Toast.makeText(this, "Error retrieving students: ${e.message}", Toast.LENGTH\_SHORT).show()

tvStudents.text = "Error loading student data."

}

}

override fun onSupportNavigateUp(): Boolean { onBackPressed()

return true

}

}

**Aim:** Create a login form with username and password and check successful login.

# Procedure:

**activity\_main.xml**

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

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

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:gravity="center"

android:padding="16dp">

<EditText

android:id="@+id/etUsername"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Username"

android:inputType="text" />

<EditText

android:id="@+id/etPassword"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Password"

android:inputType="textPassword"

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

<Button

android:id="@+id/btnLogin"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Login"

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

<TextView

android:id="@+id/tvStatus"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text=""

android:textColor="@android:color/holo\_red\_dark"

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

</LinearLayout>

# MainActivity.kt

package com.example.myapplication  
import android.os.Bundle  
import android.widget.Button  
import android.widget.EditText  
import android.widget.TextView  
import androidx.appcompat.app.AppCompatActivity  
  
class MainActivity : AppCompatActivity() {  
  
 override fun onCreate(savedInstanceState: Bundle?) {  
 super.onCreate(savedInstanceState)  
 setContentView(R.layout.*activity\_main*)  
  
 val etUsername = findViewById<EditText>(R.id.*etUsername*)  
 val etPassword = findViewById<EditText>(R.id.*etPassword*)  
 val btnLogin = findViewById<Button>(R.id.*btnLogin*)  
 val tvStatus = findViewById<TextView>(R.id.*tvStatus*)  
  
 btnLogin.setOnClickListener **{** val username = etUsername.*text*.toString()  
 val password = etPassword.*text*.toString()  
 val correctUsername = "admin"  
 val correctPassword = "password123"  
  
 if (username == correctUsername && password == correctPassword) {  
 tvStatus.*text* = "Login Successful!"  
 tvStatus.setTextColor(*resources*.getColor(android.R.color.*holo\_green\_dark*))  
 } else {  
 tvStatus.*text* = "Invalid username or password"  
 tvStatus.setTextColor(*resources*.getColor(android.R.color.*holo\_red\_dark*))  
 }  
 }  
 }  
}

# Procedure:

**activity\_main.xml**

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

<ScrollView xmlns:android="<http://schemas.android.com/apk/res/android>" android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:padding="16dp">

<LinearLayout android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:orientation="vertical">

<EditText android:id="@+id/editTextEID" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Enter Employee ID" android:inputType="text"/>

<EditText android:id="@+id/editTextEName" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Enter Employee Name" android:inputType="text"/>

<EditText android:id="@+id/editTextBasicPay" android:layout\_width="match\_parent" android:layout\_height="wrap\_content"

android:hint="Enter Basic Pay" android:inputType="numberDecimal"/>

<Button android:id="@+id/buttonCalculate" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="Calculate Salary"/>

<TextView android:id="@+id/textViewResults" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:layout\_marginTop="16dp" android:textSize="16sp"/>

<Button android:id="@+id/buttonSave"

android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="Save to Database"/>

<Button android:id="@+id/buttonViewAll" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="View All Employees"/>

</LinearLayout>

</ScrollView>

# MainActivity.kt

package com.example.application24 import android.os.Bundle

import android.widget.Button import android.widget.EditText import android.widget.TextView import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() { private lateinit var editTextEID: EditText private lateinit var editTextEName: EditText private lateinit var editTextBasicPay: EditText private lateinit var buttonCalculate: Button private lateinit var textViewResults: TextView private lateinit var buttonSave: Button

private lateinit var buttonViewAll: Button

private lateinit var databaseHelper: DatabaseHelper

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.activity\_main)

// Initialize views

editTextEID = findViewById(R.id.editTextEID) editTextEName = findViewById(R.id.editTextEName) editTextBasicPay = findViewById(R.id.editTextBasicPay) buttonCalculate = findViewById(R.id.buttonCalculate) textViewResults = findViewById(R.id.textViewResults) buttonSave = findViewById(R.id.buttonSave) buttonViewAll = findViewById(R.id.buttonViewAll)

// Initialize database helper databaseHelper = DatabaseHelper(this)

// Calculate button click listener buttonCalculate.setOnClickListener {

calculateSalary()

}

// Save button click listener buttonSave.setOnClickListener {

saveSalaryToDatabase()

}

// View All button click listener buttonViewAll.setOnClickListener {

viewAllEmployees()

}

}

private fun calculateSalary() {

val eid = editTextEID.text.toString()

val ename = editTextEName.text.toString()

val basicPay = editTextBasicPay.text.toString().toDoubleOrNull()

if (eid.isEmpty() || ename.isEmpty() || basicPay == null) { Toast.makeText(this, "Please enter all details",

Toast.LENGTH\_SHORT).show() return

}

// Salary Calculations

val hra = basicPay \* 0.5 // 50% of Basic Pay val da = basicPay \* 0.2 // 20% of Basic Pay val ta = 100.0 // Fixed TA

val pf = basicPay \* 0.02 // 2% of Basic Pay val netSalary = basicPay + hra + da + ta - pf

// Display Results val resultText = """

Employee ID: $eid Employee Name: $ename Basic Pay: $basicPay HRA (50%): $hra

DA (20%): $da

TA: $ta

PF (2%): $pf

Net Salary: $netSalary """.trimIndent()

textViewResults.text = resultText

}

private fun saveSalaryToDatabase() { val eid = editTextEID.text.toString()

val ename = editTextEName.text.toString()

val basicPay = editTextBasicPay.text.toString().toDoubleOrNull() if (eid.isEmpty() || ename.isEmpty() || basicPay == null) {

Toast.makeText(this, "Please calculate salary first", Toast.LENGTH\_SHORT).show()

return

}

// Recalculate for database val hra = basicPay \* 0.5 val da = basicPay \* 0.2 val ta = 100.0

val pf = basicPay \* 0.02

val netSalary = basicPay + hra + da + ta - pf val employee = Employee(

eid = eid, ename = ename,

basicPay = basicPay, hra = hra,

da = da, ta = ta, pf = pf,

netSalary = netSalary

)

databaseHelper.addEmployee(employee) Toast.makeText(this, "Employee salary saved to database",

Toast.LENGTH\_SHORT).show()

}

private fun viewAllEmployees() {

val employees = databaseHelper.getAllEmployees() if (employees.isEmpty()) {

textViewResults.text = "No employees found in database" return

}

val resultText = StringBuilder() resultText.append("All Employees:\n\n") employees.forEach { emp ->

resultText.append(""" Employee ID: ${emp.eid} Name: ${emp.ename}

Basic Pay: ${emp.basicPay} Net Salary: ${emp.netSalary}

""".trimIndent())

}

textViewResults.text = resultText.toString()

}

}

# Employee.kt

package com.example.application24 data class Employee(

val eid: String, val ename: String,

val basicPay: Double, val hra: Double,

val da: Double, val ta: Double, val pf: Double,

val netSalary: Double

)

# DatabaseHelper.kt

package com.example.application24 import android.content.ContentValues import android.content.Context

import android.database.sqlite.SQLiteDatabase import android.database.sqlite.SQLiteOpenHelper

class DatabaseHelper(context: Context) : SQLiteOpenHelper(context, DATABASE\_NAME, null, DATABASE\_VERSION) {

companion object {

private const val DATABASE\_NAME = "EmployeeSalaryDB" private const val DATABASE\_VERSION = 1

private const val TABLE\_EMPLOYEES = "employees"

// Columns

private const val KEY\_EID = "eid"

private const val KEY\_ENAME = "ename"

private const val KEY\_BASIC\_PAY = "basic\_pay" private const val KEY\_HRA = "hra"

private const val KEY\_DA = "da" private const val KEY\_TA = "ta" private const val KEY\_PF = "pf"

private const val KEY\_NET\_SALARY = "net\_salary"

}

override fun onCreate(db: SQLiteDatabase) {

val createTable = """CREATE TABLE $TABLE\_EMPLOYEES(

$KEY\_EID TEXT PRIMARY KEY,

$KEY\_ENAME TEXT,

$KEY\_BASIC\_PAY REAL,

$KEY\_HRA REAL,

$KEY\_DA REAL,

$KEY\_TA REAL,

$KEY\_PF REAL,

$KEY\_NET\_SALARY REAL

)"""

db.execSQL(createTable)

}

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

db.execSQL("DROP TABLE IF EXISTS $TABLE\_EMPLOYEES")

onCreate(db)

}

fun addEmployee(employee: Employee) { val db = this.writableDatabase

val values = ContentValues().apply { put(KEY\_EID, employee.eid) put(KEY\_ENAME, employee.ename) put(KEY\_BASIC\_PAY, employee.basicPay) put(KEY\_HRA, employee.hra) put(KEY\_DA, employee.da)

put(KEY\_TA, employee.ta) put(KEY\_PF, employee.pf)

put(KEY\_NET\_SALARY, employee.netSalary)

}

db.insert(TABLE\_EMPLOYEES, null, values) db.close()

}

fun getAllEmployees(): List<Employee> {

val employeeList = mutableListOf<Employee>()

val selectQuery = "SELECT \* FROM $TABLE\_EMPLOYEES"

val db = this.readableDatabase

val cursor = db.rawQuery(selectQuery, null)

cursor.use {

val eidIndex = it.getColumnIndex(KEY\_EID)

val enameIndex = it.getColumnIndex(KEY\_ENAME)

val basicPayIndex = it.getColumnIndex(KEY\_BASIC\_PAY) val hraIndex = it.getColumnIndex(KEY\_HRA)

val daIndex = it.getColumnIndex(KEY\_DA) val taIndex = it.getColumnIndex(KEY\_TA) val pfIndex = it.getColumnIndex(KEY\_PF)

val netSalaryIndex = it.getColumnIndex(KEY\_NET\_SALARY)

while (it.moveToNext()) { val employee = Employee(

eid = it.getString(eidIndex), ename = it.getString(enameIndex),

basicPay = it.getDouble(basicPayIndex), hra = it.getDouble(hraIndex),

da = it.getDouble(daIndex), ta = it.getDouble(taIndex), pf = it.getDouble(pfIndex),

netSalary = it.getDouble(netSalaryIndex)

)

employeeList.add(employee)

}

}

db.close()

return employeeList

}

}

**Aim:** Create a menu (Store, Display) to store and retrieve data of students marks from the DB.

**CO5:** Implement SQLite Database and content providers.

# Procedure:

**activity\_main.xml**

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

<LinearLayout xmlns:android="<http://schemas.android.com/apk/res/android>" xmlns:app="<http://schemas.android.com/apk/res-auto>" android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:orientation="vertical">

<androidx.appcompat.widget.Toolbar android:id="@+id/toolbar" android:layout\_width="match\_parent" android:layout\_height="?attr/actionBarSize"

/>

<LinearLayout android:layout\_width="match\_parent" android:layout\_height="match\_parent" android:orientation="vertical" android:gravity="center" android:padding="16dp">

<TextView android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:text="Student Marks Management" android:textSize="24sp" android:textStyle="bold" android:layout\_marginBottom="32dp"/>

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

android:text="Use the menu to:\n\n- Store Student Marks\n- Display Student Marks"

android:textSize="18sp" android:gravity="center"/>

</LinearLayout>

</LinearLayout>

# activity\_store\_marks.xml

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

<ScrollView xmlns:android="<http://schemas.android.com/apk/res/android>" android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:padding="16dp">

<LinearLayout android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:orientation="vertical">

<EditText

android:id="@+id/editTextRollNumber" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Enter Roll Number" android:inputType="text"/>

<EditText android:id="@+id/editTextName" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Enter Student Name" android:inputType="text"/>

<EditText android:id="@+id/editTextSubject1" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Subject 1 Marks" android:inputType="number"/>

<EditText android:id="@+id/editTextSubject2" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Subject 2 Marks" android:inputType="number"/>

<EditText android:id="@+id/editTextSubject3" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Subject 3 Marks" android:inputType="number"/>

<Button android:id="@+id/buttonSave"

android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="Save Marks"/>

<Button android:id="@+id/buttonDisplayMenu" android:layout\_width="match\_parent"

android:layout\_height="wrap\_content" android:text="Go to Display Marks"/>

</LinearLayout>

</ScrollView>

# activity\_display\_marks.xml

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

<ScrollView xmlns:android="<http://schemas.android.com/apk/res/android>" android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:padding="16dp">

<LinearLayout android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:orientation="vertical">

<EditText android:id="@+id/editTextSearchRollNumber" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:hint="Enter Roll Number to Search" android:inputType="text"/>

<Button android:id="@+id/buttonSearch" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="Search"/>

<Button android:id="@+id/buttonDisplayAll" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:text="Display All Students"/>

<TextView android:id="@+id/textViewResults" android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:layout\_marginTop="16dp"

android:textSize="16sp" android:padding="8dp" android:background="#F0F0F0"/>

</LinearLayout>

</ScrollView>

# menu\_main.xml

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

<menu xmlns:android="<http://schemas.android.com/apk/res/android>" xmlns:app="<http://schemas.android.com/apk/res-auto>">

<item

android:id="@+id/menu\_store\_marks" android:title="Store Marks" app:showAsAction="never"/>

<item

android:id="@+id/menu\_display\_marks" android:title="Display Marks" app:showAsAction="never"/>

</menu>

# MainActivity.kt

package com.example.application25 import android.content.Intent import android.os.Bundle

import android.view.Menu import android.view.MenuItem

import androidx.appcompat.app.AppCompatActivity import androidx.appcompat.widget.Toolbar

class MainActivity : AppCompatActivity() {

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

setContentView(R.layout.activity\_main)

val toolbar: Toolbar = findViewById(R.id.toolbar) setSupportActionBar(toolbar)

supportActionBar?.title = "Student Marks Management"

}

// Create options menu

override fun onCreateOptionsMenu(menu: Menu?): Boolean { menuInflater.inflate(R.menu.main\_menu, menu)

return true

}

// Handle menu item selections

override fun onOptionsItemSelected(item: MenuItem): Boolean { return when (item.itemId) {

R.id.menu\_store\_marks -> {

val intent = Intent(this, StoreMarksActivity::class.java) startActivity(intent)

true

}

R.id.menu\_display\_marks -> {

val intent = Intent(this, DisplayMarksActivity::class.java) startActivity(intent)

true

}

else -> super.onOptionsItemSelected(item)

}

}

}

# StoreMarksActivity.kt

package com.example.application25

import android.content.Intent import android.os.Bundle import android.widget.Button import android.widget.EditText import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity

class StoreMarksActivity : AppCompatActivity() { private lateinit var editTextRollNumber: EditText private lateinit var editTextName: EditText private lateinit var editTextSubject1: EditText private lateinit var editTextSubject2: EditText private lateinit var editTextSubject3: EditText private lateinit var buttonSave: Button

private lateinit var buttonDisplayMenu: Button private lateinit var databaseHelper: DatabaseHelper

override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.*activity\_store\_marks*)

// Initialize views

editTextRollNumber = findViewById(R.id.*editTextRollNumber*) editTextName = findViewById(R.id.*editTextName*) editTextSubject1 = findViewById(R.id.*editTextSubject1*) editTextSubject2 = findViewById(R.id.*editTextSubject2*) editTextSubject3 = findViewById(R.id.*editTextSubject3*) buttonSave = findViewById(R.id.*buttonSave*) buttonDisplayMenu = findViewById(R.id.*buttonDisplayMenu*)

// Initialize database helper databaseHelper = DatabaseHelper(this)

// Save button click listener buttonSave.setOnClickListener {

saveStudentMarks()

}

// Display Menu button click listener

buttonDisplayMenu.setOnClickListener {

val intent = Intent(this, DisplayMarksActivity::class.*java*) startActivity(intent)

}

}

private fun saveStudentMarks() {

val rollNumber = editTextRollNumber.*text*.toString() val name = editTextName.*text*.toString()

val subject1 = editTextSubject1.*text*.toString().*toIntOrNull*() val subject2 = editTextSubject2.*text*.toString().*toIntOrNull*() val subject3 = editTextSubject3.*text*.toString().*toIntOrNull*()

// Validate inputs

if (rollNumber.*isEmpty*() || name.*isEmpty*() ||

subject1 == null || subject2 == null || subject3 == null) { Toast.makeText(this, "Please enter all details",

Toast.*LENGTH\_SHORT*).show() return

}

// Calculate total marks and percentage

val totalMarks = subject1 + subject2 + subject3

val percentage = (totalMarks.toDouble() / 300) \* 100

// Create Student object val student = Student(

rollNumber = rollNumber, name = name,

subject1 = subject1, subject2 = subject2, subject3 = subject3, totalMarks = totalMarks, percentage = percentage

)

// Save to database databaseHelper.addStudent(student)

// Clear input fields editTextRollNumber.*text*.clear() editTextName.*text*.clear() editTextSubject1.*text*.clear()

editTextSubject2.*text*.clear() editTextSubject3.*text*.clear()

// Show success message

Toast.makeText(this, "Student marks saved successfully", Toast.*LENGTH\_SHORT*).show()

}

}

# DisplayMarksActivity.kt

package com.example.application25

import android.os.Bundle import android.widget.Button import android.widget.EditText

import android.widget.TextView import android.widget.Toast

import androidx.appcompat.app.AppCompatActivity

class DisplayMarksActivity : AppCompatActivity() { private lateinit var editTextSearchRollNumber: EditText private lateinit var buttonSearch: Button

private lateinit var buttonDisplayAll: Button private lateinit var textViewResults: TextView

private lateinit var databaseHelper: DatabaseHelper override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.*activity\_display\_marks*)

// Initialize views editTextSearchRollNumber =

findViewById(R.id.*editTextSearchRollNumber*) buttonSearch = findViewById(R.id.*buttonSearch*)

buttonDisplayAll = findViewById(R.id.*buttonDisplayAll*) textViewResults = findViewById(R.id.*textViewResults*)

// Initialize database helper databaseHelper = DatabaseHelper(this)

// Search button click listener

buttonSearch.setOnClickListener { searchStudentByRollNumber()

}

// Display All button click listener buttonDisplayAll.setOnClickListener {

displayAllStudents()

}

}

private fun searchStudentByRollNumber() {

val rollNumber = editTextSearchRollNumber.*text*.toString()

if (rollNumber.*isEmpty*()) {

Toast.makeText(this, "Please enter Roll Number", Toast.*LENGTH\_SHORT*).show()

return

}

val student = databaseHelper.getStudentByRollNumber(rollNumber) if (student != null) {

val resultText = """

Roll Number: ${student.rollNumber} Name: ${student.name}

Subject 1 Marks: ${student.subject1} Subject 2 Marks: ${student.subject2} Subject 3 Marks: ${student.subject3} Total Marks: ${student.totalMarks}

Percentage: ${String.*format*("%.2f", student.percentage)}% """.*trimIndent*()

textViewResults.*text* = resultText

} else {

textViewResults.*text* = "No student found with this Roll Number"

}

}

private fun displayAllStudents() {

val students = databaseHelper.getAllStudents()

if (students.isEmpty()) {

textViewResults.*text* = "No students found in database"

return

}

val resultText = StringBuilder() resultText.append("All Students:\n\n")

students.*forEach* { student -> resultText.append("""

Roll Number: ${student.rollNumber} Name: ${student.name}

Total Marks: ${student.totalMarks}

Percentage: ${String.*format*("%.2f", student.percentage)}%

""".*trimIndent*())

}

textViewResults.*text* = resultText.toString()

}

}

# Student.kt

package com.example.application25

data class Student(

val rollNumber: String, val name: String,

val subject1: Int, val subject2: Int, val subject3: Int, val totalMarks: Int,

val percentage: Double

)

# DatabaseHelper.kt

package com.example.application25 import android.content.ContentValues import android.content.Context

import android.database.sqlite.SQLiteDatabase

import android.database.sqlite.SQLiteOpenHelper

class DatabaseHelper(context: Context) : SQLiteOpenHelper(context, DATABASE\_NAME, null, DATABASE\_VERSION) {

companion object {

private const val DATABASE\_NAME = "StudentMarksDB" private const val DATABASE\_VERSION = 1

private const val TABLE\_STUDENTS = "students"

// Columns

private const val KEY\_ROLL\_NUMBER = "roll\_number" private const val KEY\_NAME = "name"

private const val KEY\_SUBJECT1 = "subject1" private const val KEY\_SUBJECT2 = "subject2" private const val KEY\_SUBJECT3 = "subject3"

private const val KEY\_TOTAL\_MARKS = "total\_marks" private const val KEY\_PERCENTAGE = "percentage"

}

override fun onCreate(db: SQLiteDatabase) {

val createTable = """CREATE TABLE $TABLE\_STUDENTS(

$KEY\_ROLL\_NUMBER TEXT PRIMARY KEY,

$KEY\_NAME TEXT,

$KEY\_SUBJECT1 INTEGER,

$KEY\_SUBJECT2 INTEGER,

$KEY\_SUBJECT3 INTEGER,

$KEY\_TOTAL\_MARKS INTEGER,

$KEY\_PERCENTAGE REAL

)"""

db.execSQL(createTable)

}

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

db.execSQL("DROP TABLE IF EXISTS $TABLE\_STUDENTS")

onCreate(db)

}

fun addStudent(student: Student) { val db = this.writableDatabase

val values = ContentValues().apply { put(KEY\_ROLL\_NUMBER, student.rollNumber) put(KEY\_NAME, student.name) put(KEY\_SUBJECT1, student.subject1) put(KEY\_SUBJECT2, student.subject2) put(KEY\_SUBJECT3, student.subject3) put(KEY\_TOTAL\_MARKS, student.totalMarks) put(KEY\_PERCENTAGE, student.percentage)

}

db.insert(TABLE\_STUDENTS, null, values) db.close()

}

fun getAllStudents(): List<Student> {

val studentList = mutableListOf<Student>()

val selectQuery = "SELECT \* FROM $TABLE\_STUDENTS"

val db = this.readableDatabase

val cursor = db.rawQuery(selectQuery, null)

cursor.use {

val rollNumberIndex = it.getColumnIndex(KEY\_ROLL\_NUMBER) val nameIndex = it.getColumnIndex(KEY\_NAME)

val subject1Index = it.getColumnIndex(KEY\_SUBJECT1) val subject2Index = it.getColumnIndex(KEY\_SUBJECT2) val subject3Index = it.getColumnIndex(KEY\_SUBJECT3)

val totalMarksIndex = it.getColumnIndex(KEY\_TOTAL\_MARKS) val percentageIndex = it.getColumnIndex(KEY\_PERCENTAGE)

while (it.moveToNext()) { val student = Student(

rollNumber = it.getString(rollNumberIndex), name = it.getString(nameIndex),

subject1 = it.getInt(subject1Index), subject2 = it.getInt(subject2Index), subject3 = it.getInt(subject3Index), totalMarks = it.getInt(totalMarksIndex), percentage = it.getDouble(percentageIndex)

)

studentList.add(student)

}

}

db.close()

return studentList

}

fun getStudentByRollNumber(rollNumber: String): Student? { val db = this.readableDatabase

val cursor = db.query( TABLE\_STUDENTS,

null,

"$KEY\_ROLL\_NUMBER = ?",

arrayOf(rollNumber), null,

null, null

)

return cursor.use {

if (it.moveToFirst()) {

val rollNumberIndex = it.getColumnIndex(KEY\_ROLL\_NUMBER) val nameIndex = it.getColumnIndex(KEY\_NAME)

val subject1Index = it.getColumnIndex(KEY\_SUBJECT1) val subject2Index = it.getColumnIndex(KEY\_SUBJECT2) val subject3Index = it.getColumnIndex(KEY\_SUBJECT3)

val totalMarksIndex = it.getColumnIndex(KEY\_TOTAL\_MARKS) val percentageIndex = it.getColumnIndex(KEY\_PERCENTAGE)

Student(

rollNumber = it.getString(rollNumberIndex), name = it.getString(nameIndex),

subject1 = it.getInt(subject1Index), subject2 = it.getInt(subject2Index), subject3 = it.getInt(subject3Index),

totalMarks = it.getInt(totalMarksIndex), percentage = it.getDouble(percentageIndex)

)

}

}

} else null

}