UNIVERSITI MALAYSIA TERENGGANU

FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

CSM3123 - NATIVE MOBILE PROGRAMMING

BANCHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 3 TASK (1,2,3,4)

SEMESTER 5 2024/2025

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Link Github: https://github.com/NurEzreena/CSM3123_LAB-NATIVE-PROGRAMMING.git

TASK 1 : Working with SharedPreferences

MainActivity.java

```
<?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">

    <!-- Greeting TextView -->
    <TextView
        android:id="@+id/tv_greeting"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello, enter your details below!"
        android:textSize="18sp"
        android:layout_gravity="center_horizontal"
        android:layout_marginBottom="16dp" />

    <!-- Name Input -->
    <EditText
        android:id="@+id/et_name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your name"
        android:inputType="textPersonName"
        android:layout_marginBottom="16dp" />

    <!-- Age Input -->
    <EditText
        android:id="@+id/et_age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your age"
        android:inputType="number"
        android:layout_marginBottom="16dp" />

    <!-- City Input -->
    <EditText
        android:id="@+id/et_city"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your city"
        android:inputType="text"
        android:layout_marginBottom="16dp" />

    <!-- Save Button -->
    <Button
        android:id="@+id/btn_save"
        android:layout_width="match_parent"
```

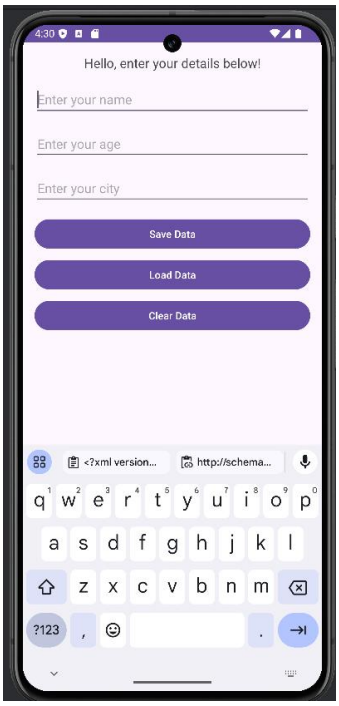
```
        android:layout_height="wrap_content"
        android:text="Save Data"
        android:background="@drawable/ripple_button"
        android:textColor="#FFFFFF"
        android:textStyle="bold"
        android:layout_marginBottom="8dp" />

    <!-- Load Button -->
    <Button
        android:id="@+id/btn_load"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Load Data"
        android:background="@drawable/ripple_button"
        android:textColor="#FFFFFF"
        android:textStyle="bold"
        android:layout_marginBottom="8dp" />

    <!-- Clear Button -->
    <Button
        android:id="@+id/btn_clear"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Clear Data"
        android:background="@drawable/ripple_button"
        android:textColor="#FFFFFF"
        android:textStyle="bold" />

</LinearLayout>
```

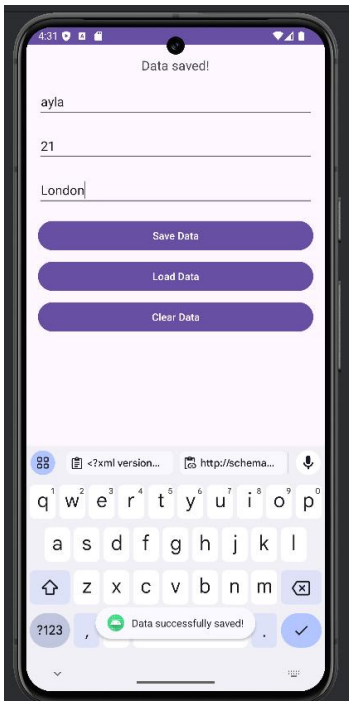
Activity_main.xml

```
<?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">

    <!-- TextView for Greeting -->
    <TextView
        android:id="@+id/tv_greeting"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello, enter your details below!"
        android:textSize="18sp"
        android:layout_marginBottom="16dp"
        android:layout_gravity="center_horizontal" />

    <!-- EditText for Name -->
    <EditText
        android:id="@+id/et_name"
        android:layout_width="match_parent"
```

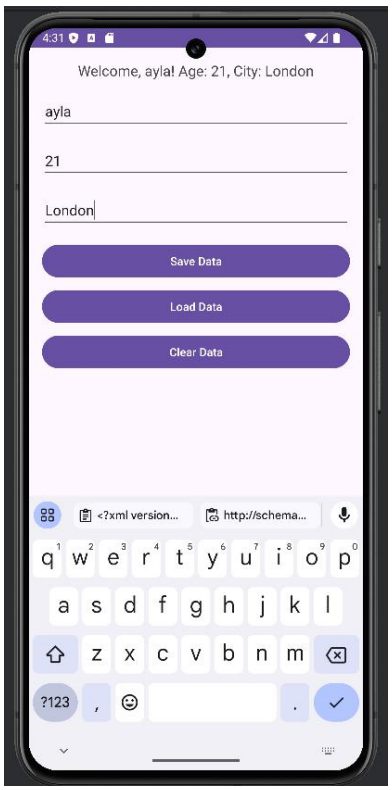
```
        android:layout_height="wrap_content"
        android:hint="Enter your name"
        android:inputType="textPersonName"
        android:layout_marginBottom="16dp" />

    <!-- EditText for Age -->
    <EditText
        android:id="@+id/et_age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your age"
        android:inputType="number"
        android:layout_marginBottom="16dp" />

    <!-- EditText for City -->
    <EditText
        android:id="@+id/et_city"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your city"
        android:inputType="text"
        android:layout_marginBottom="16dp" />

    <!-- Save Button -->
    <Button
        android:id="@+id/btn_save"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Save Data"
        android:layout_marginBottom="8dp" />

    <!-- Load Button -->
    <Button
        android:id="@+id/btn_load"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Load Data"
        android:layout_marginBottom="8dp" />

    <!-- Clear Button -->
    <Button
        android:id="@+id/btn_clear"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Clear Data" />

</LinearLayout>
```

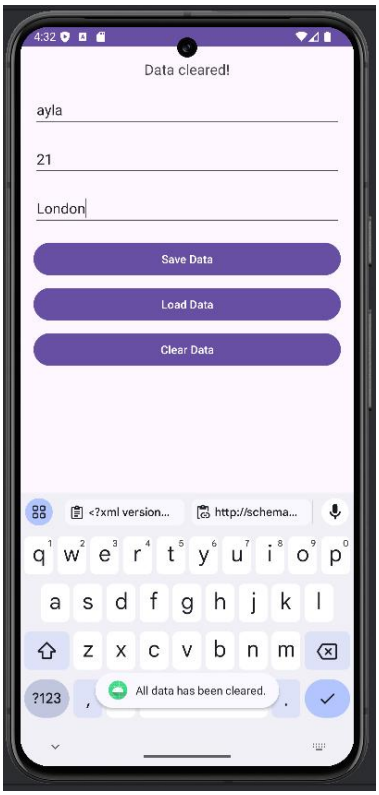
Output:





Save Data





Load Data

Clear Data

Task 2 : Working with SQLite

MainActivity.kt

```
package com.example.sqlitedemo

import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity
import com.example.sqlitedemo.com.example.sqlitedemo.DatabaseHelper

class MainActivity : AppCompatActivity() {

    private lateinit var dbHelper: DatabaseHelper

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        dbHelper = DatabaseHelper(this)

        val addUserButton = findViewById<Button>(R.id.btn_add)
        val displayUsersButton = findViewById<Button>(R.id.btn_view)
        val nameEditText = findViewById<EditText>(R.id.et_name)
        val ageEditText = findViewById<EditText>(R.id.et_age)
        val displayTextView = findViewById<TextView>(R.id.tv_result)

        addUserButton.setOnClickListener {
            val name = nameEditText.text.toString()
            val age = ageEditText.text.toString().toIntOrNull()
            if (!name.isBlank() && age != null) {
                dbHelper.addUser(name, age)
                nameEditText.text.clear()
                ageEditText.text.clear()
            }
        }

        displayUsersButton.setOnClickListener {
            val users = dbHelper.getAllUsers()
            displayTextView.text = users.joinToString("\n")
        }
    }
}
```

DatabaseHelper.kt

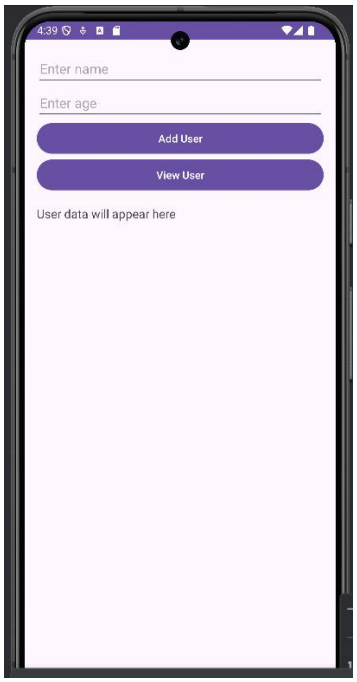
```
package com.example.sqlitedemo.com.example.sqlitedemo

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 = "UserDatabase"
        private const val DATABASE_VERSION = 1
        private const val TABLE_USERS = "Users"
        private const val COLUMN_ID = "id"
        private const val COLUMN_NAME = "name"
        private const val COLUMN_AGE = "age"
    }

    override fun onCreate(db: SQLiteDatabase?) {
        val createTable = ("CREATE TABLE $TABLE_USERS ("
                + "$COLUMN_ID INTEGER PRIMARY KEY AUTOINCREMENT, "
                + "$COLUMN_NAME TEXT, "
                + "$COLUMN_AGE INTEGER)")
        db?.execSQL(createTable)
    }

    override fun onUpgrade(db: SQLiteDatabase?, oldVersion: Int, newVersion: Int) {
        db?.execSQL("DROP TABLE IF EXISTS $TABLE_USERS")
        onCreate(db)
    }

    fun addUser(name: String, age: Int): Boolean {
        val db = this.writableDatabase
        val contentValues = ContentValues().apply {
            put(COLUMN_NAME, name)
            put(COLUMN_AGE, age)
        }

        val result = db.insert(TABLE_USERS, null, contentValues)
        db.close()
        return result != -1L
    }

    fun getAllUsers(): List<String> {
        val userList = ArrayList<String>()
        val db = this.readableDatabase
        val cursor = db.rawQuery("SELECT * FROM $TABLE_USERS", null)

        if (cursor.moveToFirst()) {
            do {
                val name = cursor.getString(cursor.getColumnIndexOrThrow(COLUMN_NAME))
                val age = cursor.getInt(cursor.getColumnIndexOrThrow(COLUMN_AGE))
                userList.add("Name: $name, Age: $age")
            } while (cursor.moveToNext())
        }
        cursor.close()
        db.close()
        return userList
    }
}
```

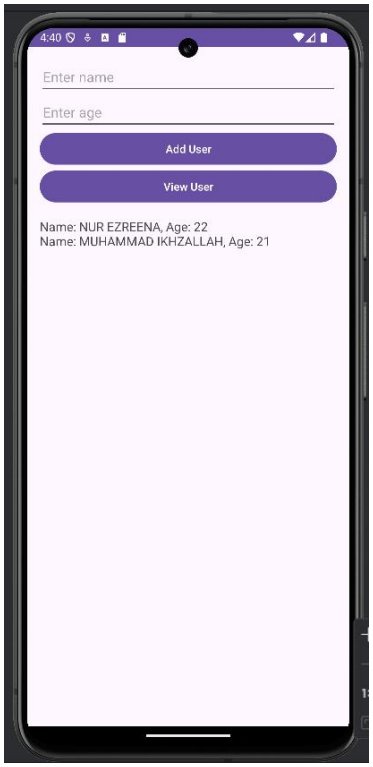
Activity_main.xml

```
<?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 for User Name -->
    <EditText
        android:id="@+id/et_name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter name"
        android:inputType="textPersonName" />

    <!-- EditText for User Age -->
    <EditText
        android:id="@+id/et_age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter age"
        android:inputType="number" />

    <!-- Button to Add User -->
    <Button
        android:id="@+id/btn_add"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Add User" />

    <!-- Button to View User -->
    <Button
        android:id="@+id/btn_view"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="View User" />

    <!-- TextView to Display User Data -->
    <TextView
        android:id="@+id/tv_result"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="User data will appear here"
        android:textSize="16sp"
        android:paddingTop="16dp" />

</LinearLayout>
```

Output:



Key in the data at add user and click button View user



Exercises

MainActivity.kt

```
package com.example.sqlitedemo

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 dbHelper: DatabaseHelper

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        dbHelper = DatabaseHelper(this)

        val addUserButton = findViewById<Button>(R.id.btn_add)
        val displayUsersButton = findViewById<Button>(R.id.btn_view)
        val updateUserButton = findViewById<Button>(R.id.btn_update)
        val deleteUserButton = findViewById<Button>(R.id.btn_delete)
        val filterUsersButton = findViewById<Button>(R.id.btn_filter)
        val nameEditText = findViewById<EditText>(R.id.et_name)
        val ageEditText = findViewById<EditText>(R.id.et_age)
        val idEditText = findViewById<EditText>(R.id.et_id)
        val displayTextView = findViewById<TextView>(R.id.tv_result)

        // Add User
        addUserButton.setOnClickListener {
            val name = nameEditText.text.toString()
            val age = ageEditText.text.toString().toIntOrNull()
            if (!name.isBlank() && age != null) {
                dbHelper.addUser(name, age)
                nameEditText.text.clear()
                ageEditText.text.clear()
            }
        }

        // Display Users
        displayUsersButton.setOnClickListener {
            val users = dbHelper.getAllUsers()
            displayTextView.text = users.joinToString("\n")
        }

        // Update User
        updateUserButton.setOnClickListener {
            val id = idEditText.text.toString().toIntOrNull()
            val name = nameEditText.text.toString()
            val age = ageEditText.text.toString().toIntOrNull()
            if (id != null && !name.isBlank() && age != null) {
                if (dbHelper.updateUser(id, name, age)) {
                    displayTextView.text = "User Updated"
                } else {
                    displayTextView.text = "Failed to update user"
                }
            }
        }
```

```
        // Delete User
        deleteUserButton.setOnClickListener {
            val id = idEditText.text.toString().toIntOrNull()
            if (id != null) {
                if (dbHelper.deleteUser(id)) {
                    displayTextView.text = "User Deleted"
                } else {
                    displayTextView.text = "Failed to delete user"
                }
            }
        }

        // Filter Users by Age
        filterUsersButton.setOnClickListener {
            val minAge = ageEditText.text.toString().toIntOrNull()
            if (minAge != null) {
                val filteredUsers = dbHelper.getUsersByAge(minAge)
                displayTextView.text = filteredUsers.joinToString("\n")
            }
        }
    }
}
```

DatabaseHelper.kt

```
package com.example.sqlitedemo

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 = "UserDatabase"
        private const val DATABASE_VERSION = 1
        private const val TABLE_USERS = "Users"
        private const val COLUMN_ID = "id"
        private const val COLUMN_NAME = "name"
        private const val COLUMN_AGE = "age"
    }

    override fun onCreate(db: SQLiteDatabase?) {
        val createTable = ("CREATE TABLE $TABLE_USERS (" +
                "$COLUMN_ID INTEGER PRIMARY KEY AUTOINCREMENT, " +
                "$COLUMN_NAME TEXT, " +
                "$COLUMN_AGE INTEGER)")
        db?.execSQL(createTable)
    }

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

```
        db?.execSQL("DROP TABLE IF EXISTS $TABLE_USERS")
        onCreate(db)
    }

    // Add a new user
    fun addUser(name: String, age: Int): Boolean {
        val db = this.writableDatabase
        val contentValues = ContentValues().apply {
            put(COLUMN_NAME, name)
            put(COLUMN_AGE, age)
        }

        val result = db.insert(TABLE_USERS, null, contentValues)
        db.close()
        return result != -1L
    }

    // Get all users sorted alphabetically
    fun getAllUsers(): List<String> {
        val userList = ArrayList<String>()
        val db = this.readableDatabase
        val cursor = db.rawQuery("SELECT * FROM $TABLE_USERS ORDER BY
$COLUMN_NAME ASC", null)

        if (cursor.moveToFirst()) {
            do {
                val name = cursor.getString(cursor.getColumnIndexOrThrow(COLUMN_NAME))
                val age = cursor.getInt(cursor.getColumnIndexOrThrow(COLUMN_AGE))
                userList.add("Name: $name, Age: $age")
            } while (cursor.moveToNext())
        }
        cursor.close()
        db.close()
        return userList
    }

    // Update a user's details
    fun updateUser(id: Int, name: String, age: Int): Boolean {
        val db = this.writableDatabase
        val contentValues = ContentValues().apply {
            put(COLUMN_NAME, name)
            put(COLUMN_AGE, age)
        }

        val result = db.update(TABLE_USERS, contentValues, "$COLUMN_ID = ?",
arrayOf(id.toString()))
        db.close()
        return result > 0
    }

    // Delete a user by ID
    fun deleteUser(id: Int): Boolean {
        val db = this.writableDatabase
        val result = db.delete(TABLE_USERS, "$COLUMN_ID = ?", arrayOf(id.toString()))
        db.close()
```

```
        return result > 0
    }

    // Filter users by age
    fun getUsersByAge(minAge: Int): List<String> {
        val userList = ArrayList<String>()
        val db = this.readableDatabase
        val cursor = db.rawQuery("SELECT * FROM $TABLE_USERS WHERE
$COLUMN_AGE >= ?", arrayOf(minAge.toString()))

        if (cursor.moveToFirst()) {
            do {
                val name = cursor.getString(cursor.getColumnIndexOrThrow(COLUMN_NAME))
                val age = cursor.getInt(cursor.getColumnIndexOrThrow(COLUMN_AGE))
                userList.add("Name: $name, Age: $age")
            } while (cursor.moveToNext())
        }
        cursor.close()
        db.close()
        return userList
    }
}
```

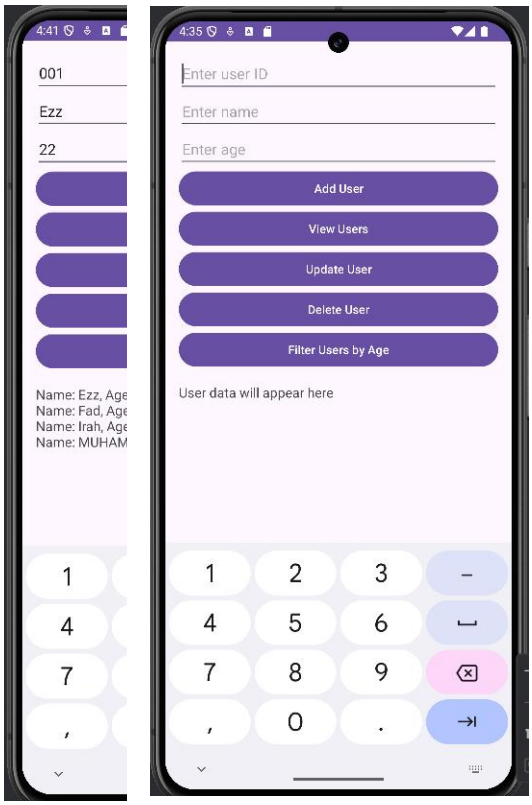
Activity_main.xml

```
<?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/et_id"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter user ID"
        android:inputType="number" />

    <EditText
        android:id="@+id/et_name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter name"
        android:inputType="textPersonName" />

    <EditText
        android:id="@+id/et_age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter age"
        android:inputType="number" />
```

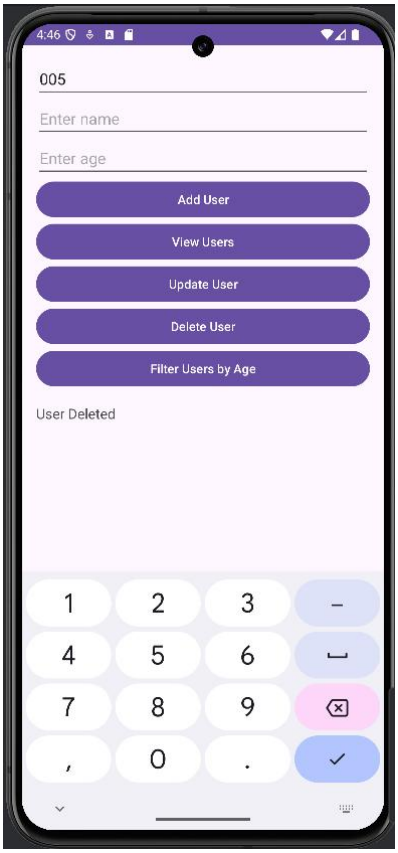
```
    <Button
        android:id="@+id/btn_add"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Add User" />

    <Button
        android:id="@+id/btn_view"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="View Users" />

    <Button
        android:id="@+id/btn_update"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Update User" />

    <Button
        android:id="@+id/btn_delete"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Delete User" />

    <Button
        android:id="@+id/btn_filter"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Filter Users by Age" />

    <TextView
        android:id="@+id/tv_result"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="User data will appear here"
        android:textSize="16sp"
        android:paddingTop="16dp" />

</LinearLayout>
```

Output:

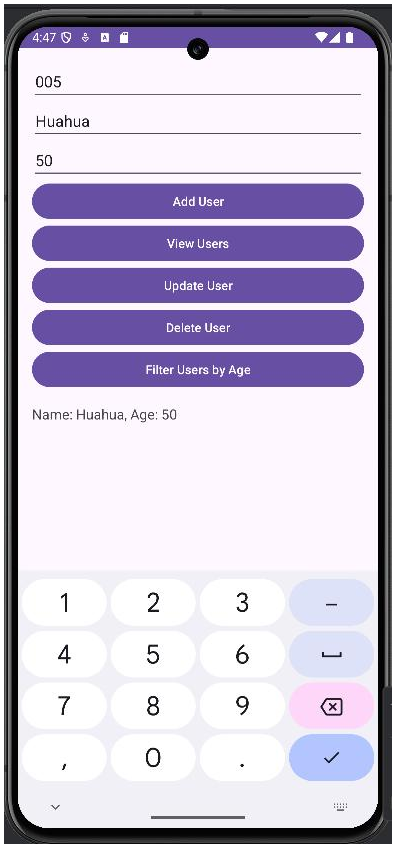
View User



Delete User



Filter User by Age



Task 3 : Working with SQLite and RecyclerView

MainActivity.kt

```
package com.example.recyclerviewsqlitedemo

import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.Toast
import androidx.appcompat.app.AlertDialog
import androidx.appcompat.app.AppCompatActivity
import androidx.recyclerview.widget.LinearLayoutManager
import androidx.recyclerview.widget.RecyclerView

class MainActivity : AppCompatActivity() {

    private lateinit var databaseHelper: DatabaseHelper
    private lateinit var userAdapter: UserAdapter
    private lateinit var recyclerView: RecyclerView
    private lateinit var addUserButton: Button

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Initialize views
        databaseHelper = DatabaseHelper(this)
        recyclerView = findViewById(R.id.recycler_view)
        addUserButton = findViewById(R.id.btn_add_user)

        // Set up button click listener
        addUserButton.setOnClickListener {
            showAddUserDialog()
        }

        // Set up RecyclerView
        setupRecyclerView()
        loadUserData()
    }

    private fun setupRecyclerView() {
        recyclerView.layoutManager = LinearLayoutManager(this)
    }

    private fun loadUserData() {
        val users = databaseHelper.getAllUsers()
        userAdapter = UserAdapter(users)
        recyclerView.adapter = userAdapter
    }

    private fun showAddUserDialog() {
        val builder = AlertDialog.Builder(this)
        builder.setTitle("Add User")
```

```
        val inflater = layoutInflater
        val dialogLayout = inflater.inflate(R.layout.dialog_add_user, null)
        builder.setView(dialogLayout)

        val etName = dialogLayout.findViewById<EditText>(R.id.et_name)
        val etAge = dialogLayout.findViewById<EditText>(R.id.et_age)

        builder.setPositiveButton("Add") { dialog, _ ->
            val name = etName.text.toString()
            val age = etAge.text.toString().toIntOrNull()

            if (name.isNotEmpty() && age != null) {
                databaseHelper.addUser(name, age)
                loadUserData()
                Toast.makeText(this, "User added", Toast.LENGTH_SHORT).show()
            } else {
                Toast.makeText(this, "Invalid input", Toast.LENGTH_SHORT).show()
            }
            dialog.dismiss()
        }

        builder.setNegativeButton("Cancel") { dialog, _ ->
            dialog.dismiss()
        }

        builder.show()
    }
}
```

DatabaseHelper.kt

```
package com.example.recyclerviewsqlitedemo

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 = "users.db"
        private const val DATABASE_VERSION = 1

        // Table and column names
        private const val TABLE_USERS = "users"
        private const val COLUMN_ID = "id"
        private const val COLUMN_NAME = "name"
        private const val COLUMN_AGE = "age"
    }

    override fun onCreate(db: SQLiteDatabase) {
```

```
        // Create the table
        val createTable = """
            CREATE TABLE $TABLE_USERS (
                $COLUMN_ID INTEGER PRIMARY KEY AUTOINCREMENT,
                $COLUMN_NAME TEXT NOT NULL,
                $COLUMN_AGE INTEGER NOT NULL
            )
        """.trimIndent()
        db.execSQL(createTable)
    }

    override fun onUpgrade(db: SQLiteDatabase, oldVersion: Int, newVersion: Int) {
        // Drop the existing table if it exists
        db.execSQL("DROP TABLE IF EXISTS $TABLE_USERS")
        onCreate(db)
    }

    // Add a new user
    fun addUser(name: String, age: Int): Long {
        val db = writableDatabase
        val values = ContentValues().apply {
            put(COLUMN_NAME, name)
            put(COLUMN_AGE, age)
        }
        val result = db.insert(TABLE_USERS, null, values)
        db.close()
        return result
    }

    // Retrieve all users
    fun getAllUsers(): List<User> {
        val userList = mutableListOf<User>()
        val db = readableDatabase
        val query = "SELECT * FROM $TABLE_USERS"
        val cursor = db.rawQuery(query, null)

        if (cursor.moveToFirst()) {
            do {
                val id = cursor.getInt(cursor.getColumnIndexOrThrow(COLUMN_ID))
                val name = cursor.getString(cursor.getColumnIndexOrThrow(COLUMN_NAME))
                val age = cursor.getInt(cursor.getColumnIndexOrThrow(COLUMN_AGE))
                userList.add(User(id, name, age)) // Adjusted for id field
            } while (cursor.moveToNext())
        }

        cursor.close()
        db.close()
        return userList
    }

    // Delete a user by ID (optional functionality)
    fun deleteUser(id: Int): Int {
        val db = writableDatabase
        val result = db.delete(TABLE_USERS, "$COLUMN_ID = ?", arrayOf(id.toString()))
        db.close()
```

```
        return result
    }
}
```

User.kt

```
package com.example.recyclerviewsqlitedemo


data class User (
    val id: Int,
    val name: String,
    val age: Int
)
```

UserAdapter.kt

```
package com.example.recyclerviewsqlitedemo

import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.TextView
import androidx.recyclerview.widget.RecyclerView

class UserAdapter(private val userList: List<User>) :
RecyclerView.Adapter<UserAdapter.UserViewHolder>() {

    override fun onCreateViewHolder(parent: ViewGroup, viewType: Int): UserViewHolder {
        val view = LayoutInflater.from(parent.context).inflate(R.layout.user_item, parent,
false)
        return UserViewHolder(view)
    }

    override fun onBindViewHolder(holder: UserViewHolder, position: Int) {
        val user = userList[position]
        holder.nameTextView.text = user.name
        holder.ageTextView.text = user.age.toString()
    }

    override fun getItemCount(): Int {
        return userList.size
    }

    class UserViewHolder(itemView: View) : RecyclerView.ViewHolder(itemView) {
        val nameTextView: TextView = itemView.findViewById(R.id.tv_name)
        val ageTextView: TextView = itemView.findViewById(R.id.tv_age)
    }
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    tools:context=".MainActivity">

    <!-- Button centered -->
    <Button
        android:id="@+id/btn_add_user"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Add User"
        android:layout_gravity="center"
        android:layout_marginTop="100dp"/>

    <!-- RecyclerView below the Button -->
    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/recycler_view"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:paddingTop="16dp"/>

</LinearLayout>
```

User_item.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:padding="16dp"
    android:layout_gravity="center"
    android:elevation="4dp"
    android:clipToPadding="false"
    android:gravity="center">


    <TextView
        android:id="@+id/tv_name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Name"
        android:textSize="18sp"
        android:textColor="@android:color/black"
        android:gravity="center" />
```

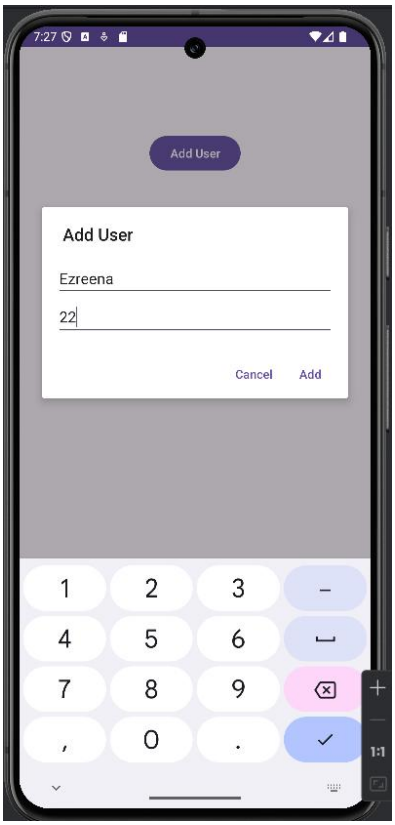
```
    <!-- Age TextView -->
    <TextView
        android:id="@+id/tv_age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Age"
        android:textSize="18sp"
        android:textColor="@android:color/black"
        android:fontFamily="sans-serif"
        android:gravity="center" /> <!-- Centers the text -->

</LinearLayout>
```

Dialog_add_user.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/et_name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Name" />

    <EditText
        android:id="@+id/et_age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Age"
        android:inputType="number" />

</LinearLayout>
```

Output:


7:27
Add User


7:27
Add User
Add User
Ezreena
22
Cancel
Add
1
2
3
4
5
6
7
8
9
,
0
.


7:32
Add User
Ezreena
22

Task 4 : Working With Fragments

MainActivity.kt

```
package com.example.fragmentexample

import android.os.Bundle
import androidx.appcompat.app.AppCompatActivity
import androidx.fragment.app.Fragment
import androidx.fragment.app.FragmentTransaction

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Dynamically add the fragment to the Activity
        if (savedInstanceState == null) {
            val myFragment = MyFragment()
            val transaction: FragmentTransaction =
supportFragmentManager.beginTransaction()
            transaction.replace(R.id.fragment, myFragment)
            transaction.commit()
        }
    }
}
```

MyFragment.kt

```
package com.example.fragmentexample

import android.os.Bundle
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import androidx.fragment.app.Fragment

class MyFragment : Fragment() {

    override fun onCreateView(
        inflater: LayoutInflater, container: ViewGroup?,
        savedInstanceState: Bundle?
    ): View? {
        // Inflate the fragment's layout
        return inflater.inflate(R.layout.fragment_my, container, false)
    }
}
```

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">

   <!-- Container for dynamically loaded fragments -->
   <FrameLayout
      android:id="@+id/fragment_container"
      android:layout_width="match_parent"
      android:layout_height="match_parent" />

</RelativeLayout>
```

Fragment_my.xml

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

   <TextView
      android:id="@+id/fragment_text"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="This is MyFragment"
      android:textSize="18sp"/>

</LinearLayout>
```

Output:

Handling Fragment Lifecycle

MainActivity.kt

```
package com.example.fragmentexample

import android.os.Bundle
import androidx.appcompat.app.AppCompatActivity
import androidx.fragment.app.FragmentTransaction

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Dynamically add the fragment to the Activity
        if (savedInstanceState == null) {
            val myFragment = MyFragment()
            val transaction: FragmentTransaction =
supportFragmentManager.beginTransaction()
            transaction.replace(R.id.fragment_container, myFragment)
            transaction.commit()
        }
    }
}
```

MyFragment.kt

```
package com.example.fragmentexample

import android.os.Bundle
```

```
import android.util.Log
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import androidx.fragment.app.Fragment

class MyFragment : Fragment() {

    private val TAG = "MyFragment"

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        Log.d(TAG, "onCreate")
    }

    override fun onCreateView(
        inflater: LayoutInflater, container: ViewGroup?,
        savedInstanceState: Bundle?
    ): View? {
        Log.d(TAG, "onCreateView")
        return inflater.inflate(R.layout.fragment_my, container, false)
    }

    override fun onStart() {
        super.onStart()
        Log.d(TAG, "onStart")
    }

    override fun onResume() {
        super.onResume()
        Log.d(TAG, "onResume")
    }

    override fun onPause() {
        super.onPause()
        Log.d(TAG, "onPause")
    }

    override fun onStop() {
        super.onStop()
        Log.d(TAG, "onStop")
    }

    override fun onDestroyView() {
        super.onDestroyView()
        Log.d(TAG, "onDestroyView")
    }

    override fun onDestroy() {
        super.onDestroy()
        Log.d(TAG, "onDestroy")
    }

    override fun onDetach() {
        super.onDetach()
```

```
        Log.d(TAG, "onDetach")
    }
}
```

Activity_main.xml

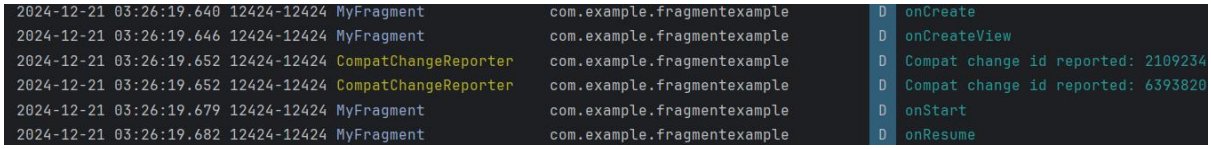
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <!-- Container for dynamically loaded fragments -->
    <FrameLayout
        android:id="@+id/fragment_container"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

</RelativeLayout>
```

Fragment_my.xml

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

    <TextView
        android:id="@+id/fragment_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is MyFragment"
        android:textSize="18sp"/>

</LinearLayout>
```

Output:

On LogCat:



Communicating Between Fragments

MainActivity.kt

```
package com.example.fragmentexample

import android.os.Bundle
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Load MyFragment by default
        supportFragmentManager.beginTransaction()
            .replace(R.id.fragment_container, MyFragment())
            .commit()
```

```
    }

    fun sendDataToFragment2(data: String) {
        val fragment2 = Fragment2()

        // Replace MyFragment with Fragment2
        supportFragmentManager.beginTransaction()
            .replace(R.id.fragment_container, fragment2)
            .commit()


    }
}
```

MyFragment.kt

```
package com.example.fragmentexample

import android.os.Bundle
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.Button
import androidx.fragment.app.Fragment

class MyFragment : Fragment() {

    override fun onCreateView(
        inflater: LayoutInflater, container: ViewGroup?,
        savedInstanceState: Bundle?
    ): View? {
        val view = inflater.inflate(R.layout.fragment_my, container, false)

        // Find the button and set its click listener
        val button: Button = view.findViewById(R.id.button_send)
        button.setOnClickListener {
            (activity as? MainActivity)?.sendDataToFragment2("Hello from MyFragment")
        }

        return view
    }
}
```

Fragment2.kt

```
package com.example.fragmentexample

import android.os.Bundle
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.Button
import android.widget.TextView
import androidx.fragment.app.Fragment
```

```
class Fragment2 : Fragment() {

    override fun onCreateView(
        inflater: LayoutInflater, container: ViewGroup?,
        savedInstanceState: Bundle?
    ): View? {
        val view = inflater.inflate(R.layout.fragment2, container, false)

        // Get the data from arguments
        val message = arguments?.getString("message")

        // Display the message in the TextView
        val textView: TextView = view.findViewById(R.id.display_message)
        textView.text = message

        // Button action
        val button: Button = view.findViewById(R.id.button_action)
        button.setOnClickListener {
            // Perform any action here when the button is clicked
            textView.text = "Action performed!"
        }

        return view
    }
}
```

Activity_main.xml

```
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <FrameLayout
        android:id="@+id/fragment_container"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />
</RelativeLayout>
```

Fragment_my.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 displaying a message -->
    <TextView
        android:id="@+id/fragment_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="This is MyFragment"
        android:textSize="18sp"
        android:textColor="#000000"
        android:gravity="center" /> <!-- Optional: Center alignment -->

    <!-- Button to send data to MainActivity -->
    <Button
        android:id="@+id/button_send"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Send Data to Fragment 2" />
</LinearLayout>
```

Fragment2.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=".Fragment2">

    <!-- Title TextView -->
    <TextView
        android:id="@+id/title_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hi welcome my fragment 2!"
        android:textSize="22sp"
        android:textColor="#333333"
        android:fontFamily="sans-serif-medium"
        android:layout_marginTop="32dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

    <!-- TextView to display the message -->
    <TextView
        android:id="@+id/display_message"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="You made it!"
        android:textSize="18sp"
        android:textColor="#666666"
        android:layout_marginTop="16dp"
        android:layout_marginStart="32dp"
        android:layout_marginEnd="32dp"
        app:layout_constraintTop_toBottomOf="@id/title_text"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

    <!-- Button to perform an action -->
```

```
    <Button
        android:id="@+id/button_action"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="click on me"
        android:backgroundTint="#6200EE"
        android:textColor="#FFFFFF"
        android:layout_marginTop="24dp"
        app:layout_constraintTop_toBottomOf="@id/display_message"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

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

Output: