Calculator

xml

```
<!-- res/layout/activity_main.xml -->
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

    <EditText
        android:id="@+id/display"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="16dp"
        android:background="@android:color/transparent"
        android:hint="0"
        android:inputType="none"
        android:gravity="end"
        android:textSize="32sp" />

    <GridLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:columnCount="4"
        android:rowCount="5"
```

```
    android:layout_gravity="center">

    <!-- Row 1 -->
    <Button android:text="7" android:id="@+id/button7"
style="@style/CalculatorButton"/>
    <Button android:text="8" android:id="@+id/button8"
style="@style/CalculatorButton"/>
    <Button android:text="9" android:id="@+id/button9"
style="@style/CalculatorButton"/>
    <Button android:text="/" android:id="@+id/buttonDivide"
style="@style/CalculatorButton"/>

    <!-- Row 2 -->
    <Button android:text="4" android:id="@+id/button4"
style="@style/CalculatorButton"/>
    <Button android:text="5" android:id="@+id/button5"
style="@style/CalculatorButton"/>
    <Button android:text="6" android:id="@+id/button6"
style="@style/CalculatorButton"/>
    <Button android:text="*" android:id="@+id/buttonMultiply"
style="@style/CalculatorButton"/>

    <!-- Row 3 -->
    <Button android:text="1" android:id="@+id/button1"
style="@style/CalculatorButton"/>
    <Button android:text="2" android:id="@+id/button2"
style="@style/CalculatorButton"/>
    <Button android:text="3" android:id="@+id/button3"
style="@style/CalculatorButton"/>
```

```
    <Button android:text="-" android:id="@+id/buttonSubtract"
style="@style/CalculatorButton"/>

    <!-- Row 4 -->
    <Button android:text="0" android:id="@+id/button0"
style="@style/CalculatorButton"/>
    <Button android:text="C" android:id="@+id/buttonClear"
style="@style/CalculatorButton"/>
    <Button android:text="=" android:id="@+id/buttonEquals"
style="@style/CalculatorButton"/>
    <Button android:text="+" android:id="@+id/buttonAdd"
style="@style/CalculatorButton"/>
  </GridLayout>

</LinearLayout>
```

Java

```
// src/main/java/com/example/calculator/MainActivity.java
package com.example.calculator;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;
```

```
public class MainActivity extends AppCompatActivity {
    private EditText display;
    private String currentInput = "";
    private String operator = "";
    private double operand1 = 0;

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

        display = findViewById(R.id.display);

        int[] buttonIds = {
                R.id.button0, R.id.button1, R.id.button2, R.id.button3,
                R.id.button4, R.id.button5, R.id.button6, R.id.button7,
                R.id.button8, R.id.button9, R.id.buttonAdd, R.id.buttonSubtract,
                R.id.buttonMultiply, R.id.buttonDivide, R.id.buttonEquals,
                R.id.buttonClear
        };

        for (int id : buttonIds) {
            findViewById(id).setOnClickListener(this::onButtonClick);
        }
    }
```

```
private void onButtonClick(View view) {
    Button button = (Button) view;
    String buttonText = button.getText().toString();

    switch (buttonText) {
        case "C":
            clear();
            break;
        case "+":
        case "-":
        case "*":
        case "/":
            setOperator(buttonText);
            break;
        case "=":
            calculateResult();
            break;
        default:
            appendToDisplay(buttonText);
            break;
    }
}

private void appendToDisplay(String value) {
    currentInput += value;
    display.setText(currentInput);
```

```
}

private void setOperator(String op) {
    if (!currentInput.isEmpty()) {
        operand1 = Double.parseDouble(currentInput);
        operator = op;
        currentInput = "";
    }
}

private void calculateResult() {
    if (operator.isEmpty() || currentInput.isEmpty()) return;

    double operand2 = Double.parseDouble(currentInput);
    double result = 0;

    switch (operator) {
        case "+":
            result = operand1 + operand2;
            break;
        case "-":
            result = operand1 - operand2;
            break;
        case "*":
            result = operand1 * operand2;
            break;
```

```
            case "/":
                result = operand2 != 0 ? operand1 / operand2 : 0;  // Avoid division by zero
                break;
        }

        display.setText(String.valueOf(result));
        operator = "";
        currentInput = String.valueOf(result);
    }

    private void clear() {
        currentInput = "";
        operator = "";
        operand1 = 0;
        display.setText("");
    }
}
```

User authentication

```
<!-- res/layout/activity_main.xml -->
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
```

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

<EditText
   android:id="@+id/et_name"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:hint="Full Name" />

<EditText
   android:id="@+id/et_username"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:hint="Email"
   android:inputType="textEmailAddress" />

<EditText
   android:id="@+id/et_password"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:hint="Password"
   android:inputType="textPassword" />

<Button
   android:id="@+id/btn_register"
   android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:text="Register" />

</LinearLayout>
```

Java

```
// src/main/java/com/example/yourapp/MainActivity.java
package com.example.yourapp;

import android.os.Bundle;
import android.text.TextUtils;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import com.google.firebase.auth.FirebaseAuth;
import com.google.firebase.auth.FirebaseUser;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;

public class MainActivity extends AppCompatActivity {
    private EditText etName, etUsername, etPassword;
    private Button btnRegister;
```

```
private FirebaseAuth mAuth;
private DatabaseReference mDatabase;

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

    // Initialize Firebase Auth and Database Reference
    mAuth = FirebaseAuth.getInstance();
    mDatabase = FirebaseDatabase.getInstance().getReference("Users");

    // Link UI elements
    etName = findViewById(R.id.et_name);
    etUsername = findViewById(R.id.et_username);
    etPassword = findViewById(R.id.et_password);
    btnRegister = findViewById(R.id.btn_register);

    // Set up button listener
    btnRegister.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            registerUser();
        }
    });
}
```

```
  private void registerUser() {
    String name = etName.getText().toString().trim();
    String email = etUsername.getText().toString().trim();
    String password = etPassword.getText().toString().trim();

    if (TextUtils.isEmpty(name) || TextUtils.isEmpty(email) || TextUtils.isEmpty(password)) {
      Toast.makeText(this, "All fields are required", Toast.LENGTH_SHORT).show();
      return;
    }

    mAuth.createUserWithEmailAndPassword(email, password)
        .addOnCompleteListener(this, task -> {
          if (task.isSuccessful()) {
            // Successfully registered, save user info to database
            FirebaseUser firebaseUser = mAuth.getCurrentUser();
            if (firebaseUser != null) {
              saveUserInfo(firebaseUser.getUid(), name, email);
            }
          } else {
            // Registration failed
            Toast.makeText(MainActivity.this, "Registration Failed: " +
task.getException().getMessage(), Toast.LENGTH_LONG).show();
          }
        });
  }
```

```
    private void saveUserInfo(String userId, String name, String email) {
        User user = new User(name, email);
        mDatabase.child(userId).setValue(user)
                .addOnCompleteListener(task -> {
                    if (task.isSuccessful()) {
                        Toast.makeText(MainActivity.this, "Registration Successful",
Toast.LENGTH_SHORT).show();
                    } else {
                        Toast.makeText(MainActivity.this, "Failed to save user info: " +
task.getException().getMessage(), Toast.LENGTH_LONG).show();
                    }
                });
    }

    // User class to store user data
    public static class User {
        public String name;
        public String email;

        public User() {
            // Default constructor required for calls to DataSnapshot.getValue(User.class)
        }

        public User(String name, String email) {
            this.name = name;
```

```
        this.email = email;
      }
    }
}
```

Todo

Xml

```
<!-- res/layout/activity_main.xml -->
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

    <EditText
        android:id="@+id/et_task"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter new task" />

    <Button
        android:id="@+id/btn_add_task"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="Add Task" />

    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/recycler_view"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:paddingTop="16dp"/>

</LinearLayout>
```

Java

```
// src/main/java/com/example/yourapp/TaskAdapter.java
package com.example.yourapp;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.TextView;
import androidx.annotation.NonNull;
import androidx.recyclerview.widget.RecyclerView;
import java.util.List;

public class TaskAdapter extends RecyclerView.Adapter<TaskAdapter.TaskViewHolder> {
```

```
    private List<Task> taskList;
    private OnDeleteClickListener deleteClickListener;

    public interface OnDeleteClickListener {
        void onDeleteClick(int position);
    }

    public TaskAdapter(List<Task> taskList, OnDeleteClickListener deleteClickListener) {
        this.taskList = taskList;
        this.deleteClickListener = deleteClickListener;
    }

    @NonNull
    @Override
    public TaskViewHolder onCreateViewHolder(@NonNull ViewGroup parent, int viewType)
{
        View view = LayoutInflater.from(parent.getContext()).inflate(R.layout.item_task,
parent, false);
        return new TaskViewHolder(view);
    }

    @Override
    public void onBindViewHolder(@NonNull TaskViewHolder holder, int position) {
        Task task = taskList.get(position);
        holder.taskDescription.setText(task.getDescription());
```

```
        holder.deleteButton.setOnClickListener(v ->
deleteClickListener.onDeleteClick(position));
    }

    @Override
    public int getItemCount() {
        return taskList.size();
    }

    public static class TaskViewHolder extends RecyclerView.ViewHolder {
        TextView taskDescription;
        Button deleteButton;

        public TaskViewHolder(View itemView) {
            super(itemView);
            taskDescription = itemView.findViewById(R.id.task_description);
            deleteButton = itemView.findViewById(R.id.btn_delete_task);
        }
    }
}
```