LAB MANUAL

of

Mobile Application Development Laboratory

(CS347)

Bachelor of Technology (CSE)

By

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Third Year, Semester 5

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NAVRACHANA UNIVERSITY

a UGC recognized University

Department of Computer Science and Engineering

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Navrachana University, Vadodara

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PRACTICAL: - 1

Program Definition: - Introductory Session of Mobile Application Development, Installation of required software's for App development i.e., Android Studio.

- **What is the Mobile Application?**
  - A mobile application, often referred to as a mobile app, is a software application designed to run on mobile devices such as smartphones and tablets.They are developed to perform specific tasks or provide specific services, ranging from entertainment and social networking to productivity and information.

- **Key aspects of Mobile Application.**
  - **Platform Specificity**: Apps are often designed for specific operating systems, like iOS or Android.
  - **User Interface**: Designed to be user-friendly with touch interfaces.
  - **Functionality**: Can include various features like GPS, cameras, and sensors to provide a wide range of functionalities.
  - **Performance**: Optimized for mobile devices, ensuring smooth performance and quick load times.
  - **Offline Capabilities**: Many apps can work offline or with limited connectivity.
  - **Security**: Includes measures to protect user data and privacy.

- **types of mobile application.**
  - There are Three kinds of mobile applications.
    1. **Native Apps:** These are developed for a specific operating system (iOS, Android) using the respective platform's programming languages (Swift for iOS, Kotlin/Java for Android). They offer the best performance and integration with the device's hardware and features.

    2. **Web Apps:** These are essentially websites optimized for mobile viewing. They run on web browsers and do not require installation from an app store.

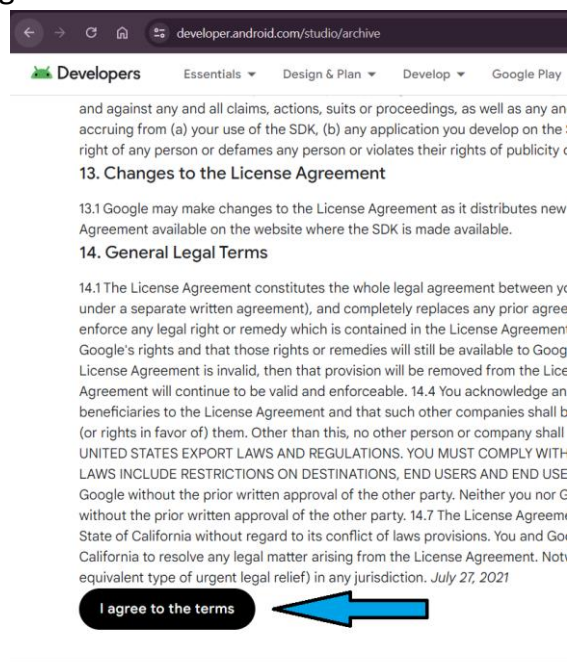
    3. **Hybrid Apps:** Combining elements of both native and web apps, hybrid apps are built using web technologies (HTML, CSS, JavaScript) but are wrapped in a native shell, allowing them to be distributed via app stores and to access device features.

- **system requirements for android studio.**
  - **Minimum Requirements:**
    - Operating System: Windows 7/8/10/11 (32-bit or 64-bit)
    - RAM: 4 GB
    - Disk Space: 2 GB of available disk space (minimum) plus at least 1 GB for Android SDK, emulator system images, and caches
    - JDK Version: Java Development Kit (JDK) 8 or higher
    - Screen Resolution: 1280 x 800 minimum

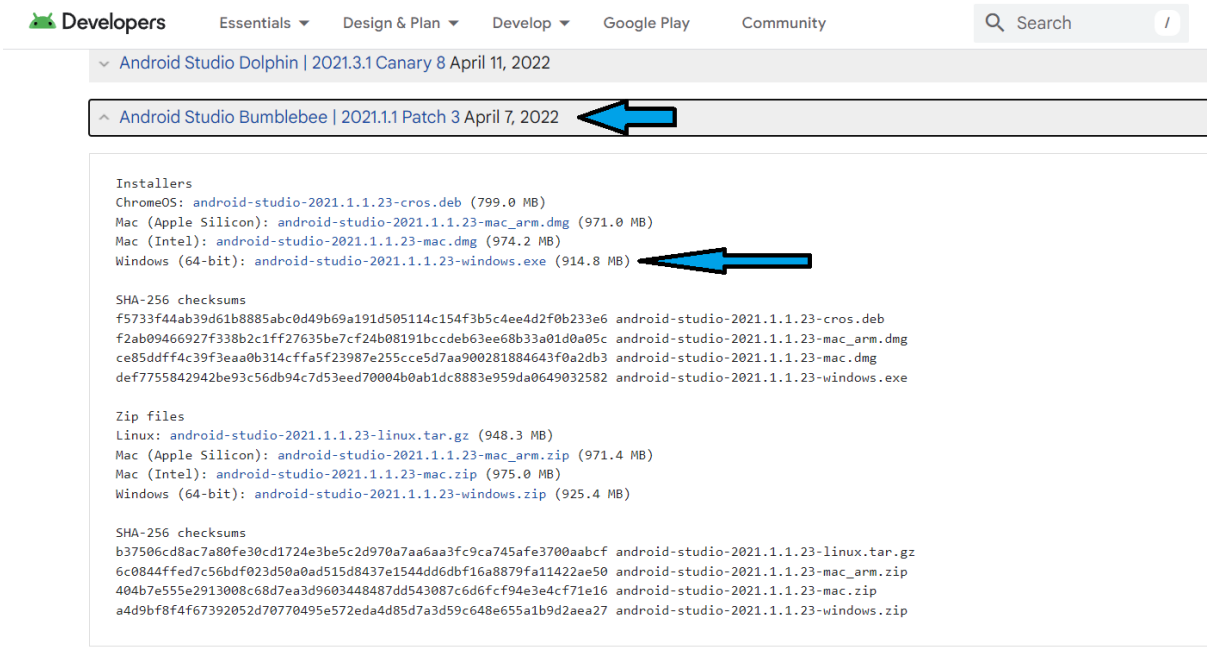
  - **Recommended Requirements:**
    - Operating System: Windows 10/11 (64-bit)
    - RAM: 8 GB or more
    - Disk Space: 4 GB of available disk space (minimum) plus 1 GB for Android SDK, emulator system images, and caches
    - JDK Version: Latest version of JDK
    - Screen Resolution: 1920 x 1080 or higher
    - Graphics: Dedicated graphics card for better performance with the Android Emulator

- **Step by Step installation of Android studio.**
  1) Open on web browser and navigate https://developer.android.com/studio/archive

  2) Click on the Agree with the term button



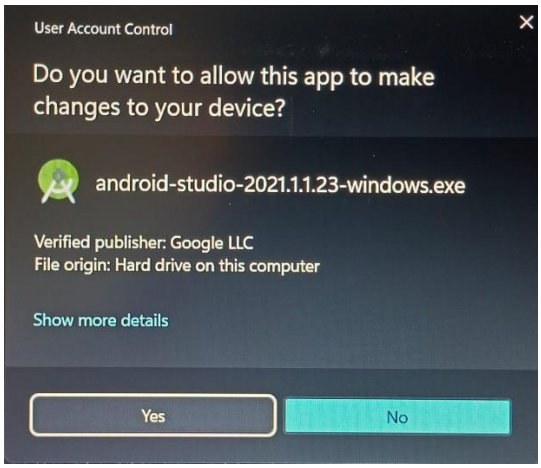
3) Find the versions dated 7th April 2022 in it and download those versions.



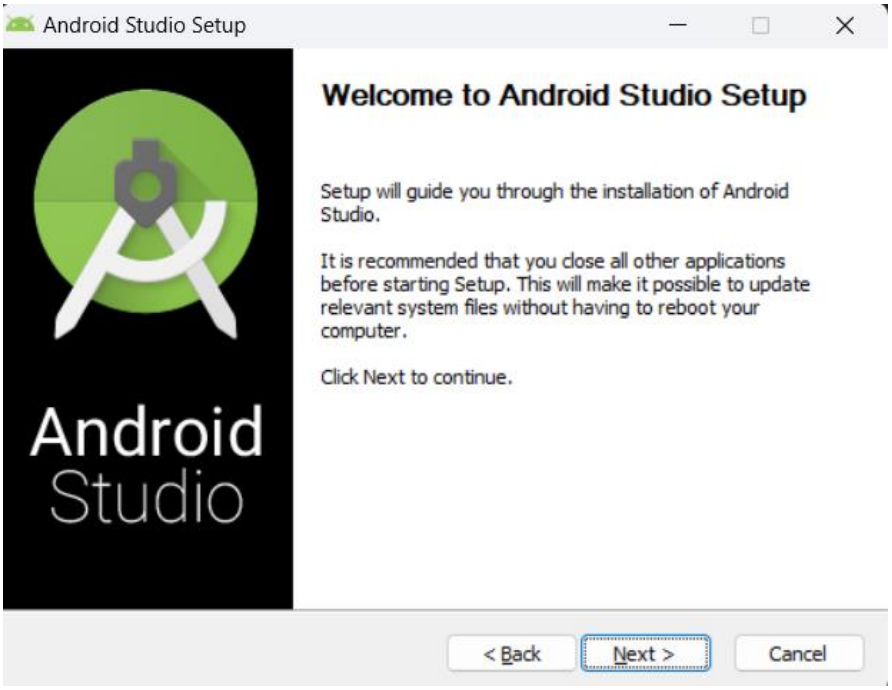
4) Open the folder where you downloaded and saved the Android Studio installation file.

5) Double-click the downloaded file.

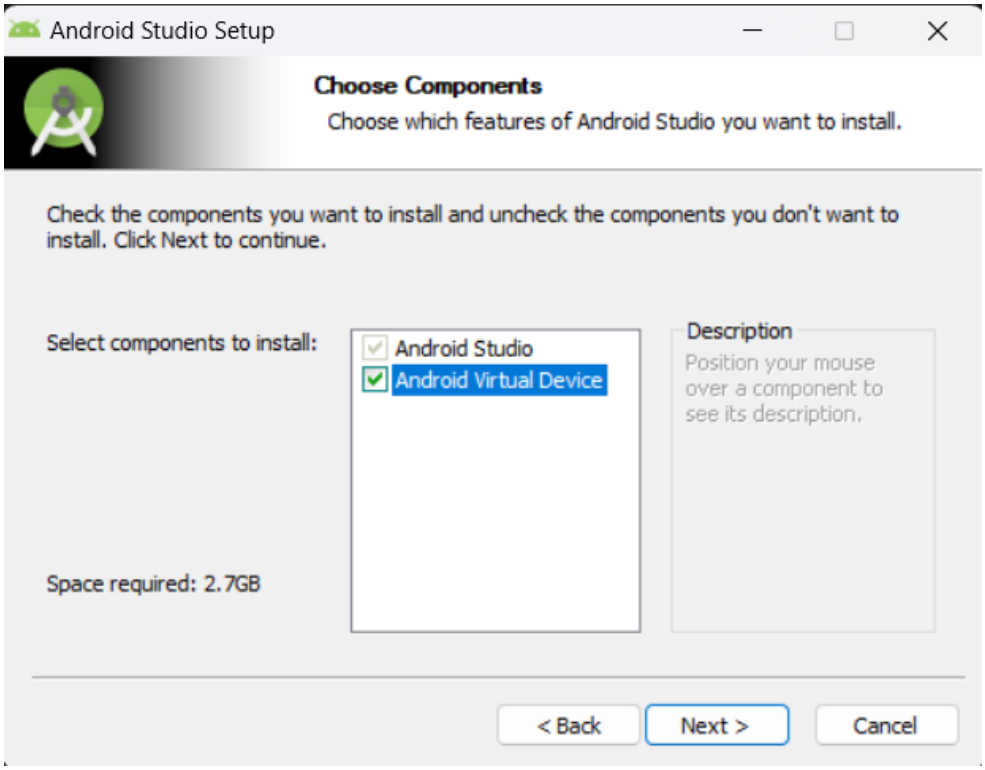
6) If you see a User Account Control dialog about allowing the installation to make changes to your computer, **click "Yes"** to confirm the installation.



7) The **Welcome to Android Studio Setup** dialog displays.

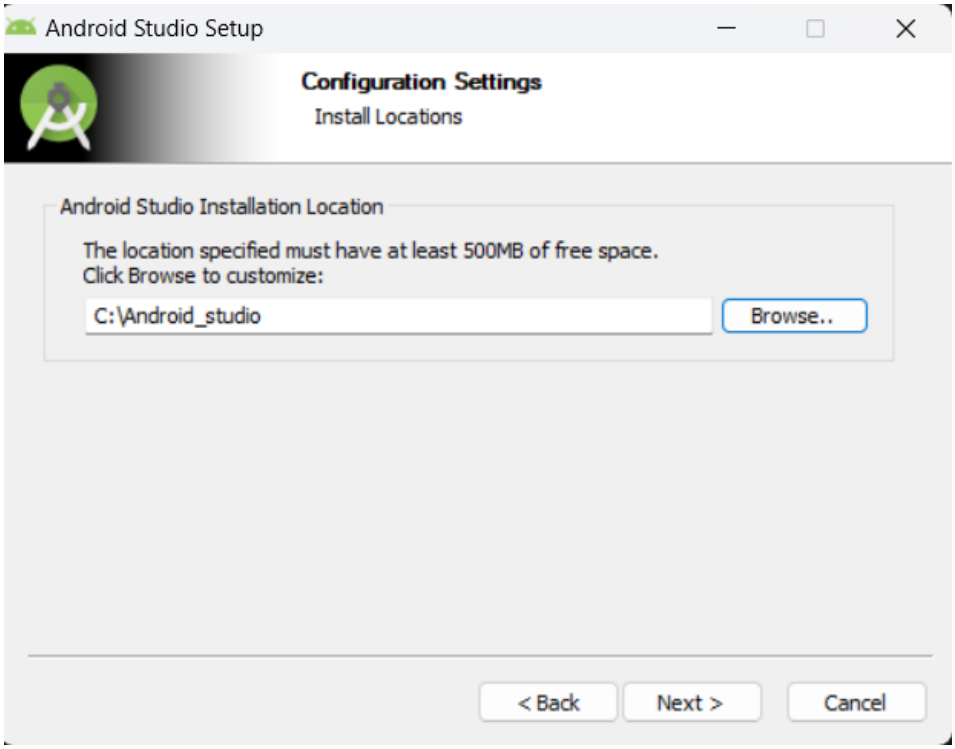


8) Select the components you want to install. The default selections are recommended.



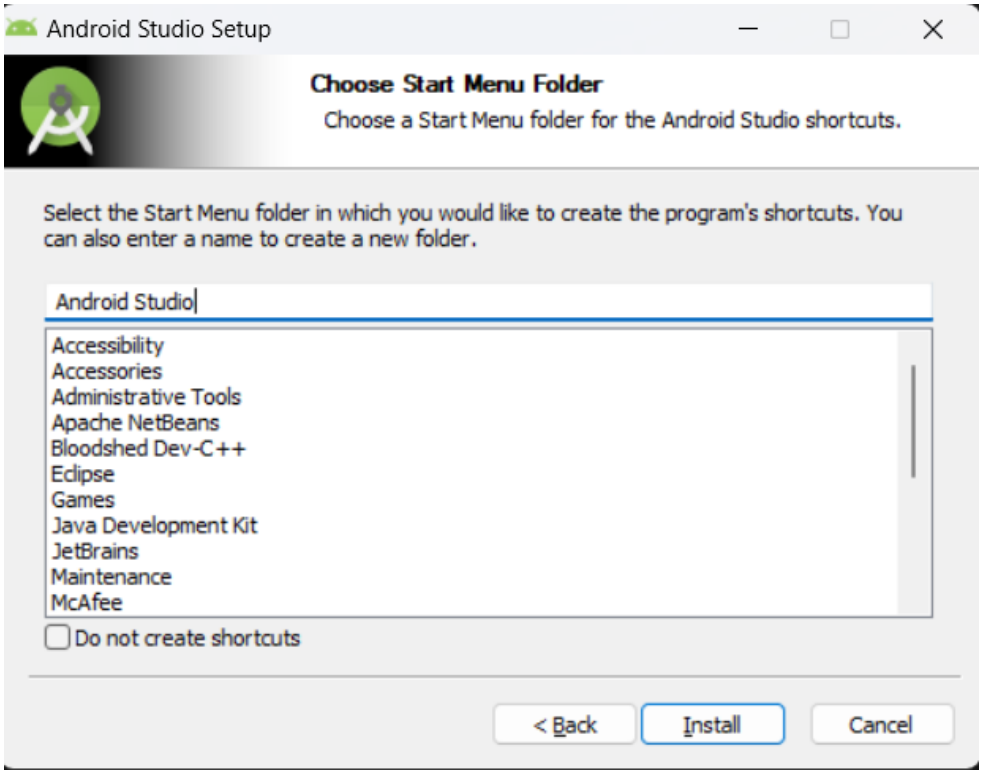
9) **Click "Next."**

10) Choose the directory where you want to install Android Studio.

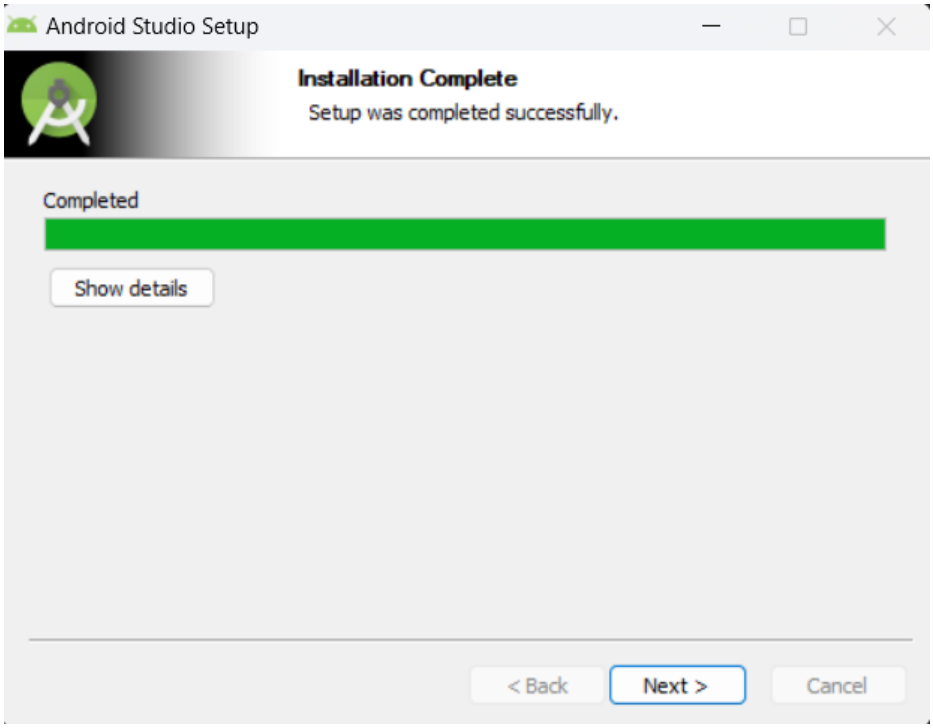


11) **Click "Next"** to start the installation.

12) **Click "Install"** to begin the installation process.

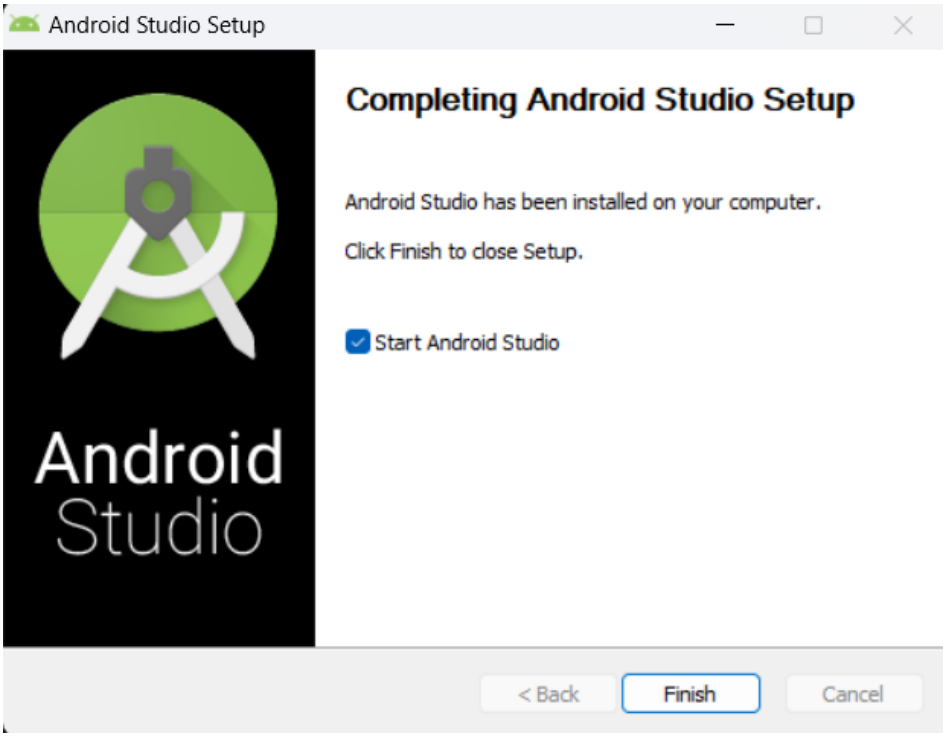


13) It will start the installation, and once it is completed, it will be like the image shown below.



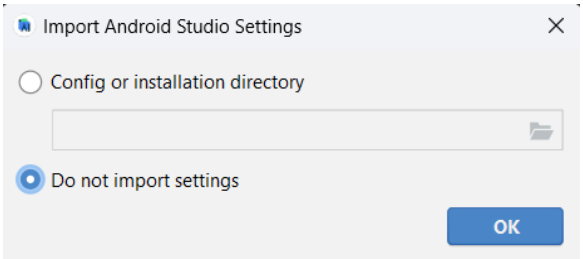
14) **Click “Next.”**

15) **Click “Finish.”**

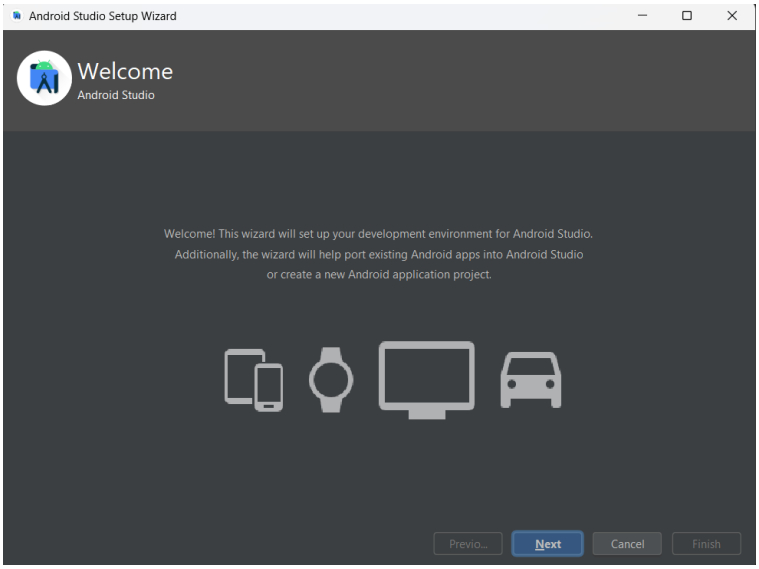


16) Once **"Finish"** is clicked, it will ask whether the previous settings need to be imported [if the android studio had been installed earlier], or not. It is better to **choose the 'Don't import Settings option'.**

17) **Click "Ok." Button**

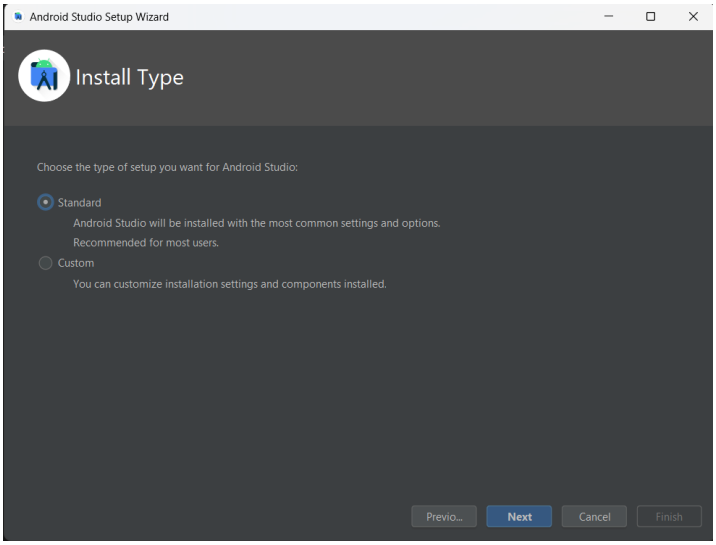


18) After it has found the SDK components, it will redirect to the **Welcome dialog box.**

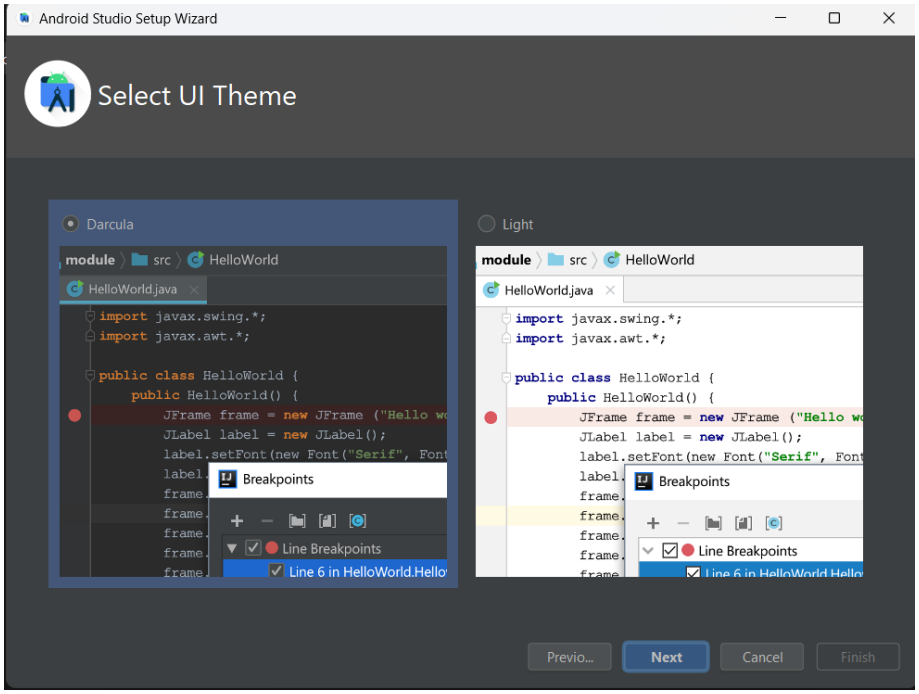


19) **Click "Next."**

20). Choose **Standard** and **click on "Next"**.

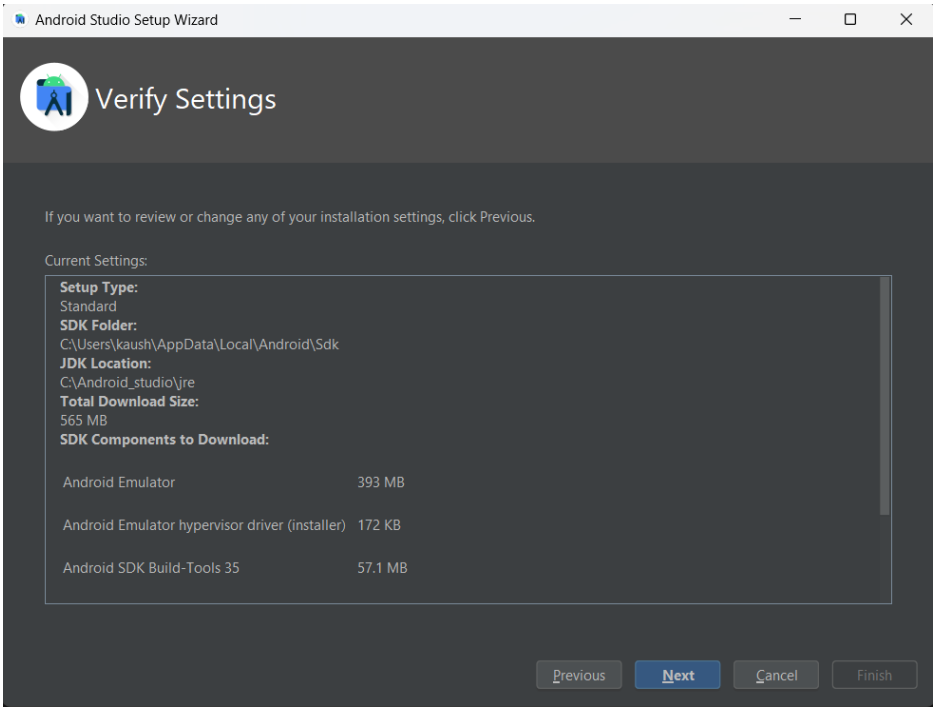


21) Now **choose the theme**, whether the **Light** theme or the **Dark** one.

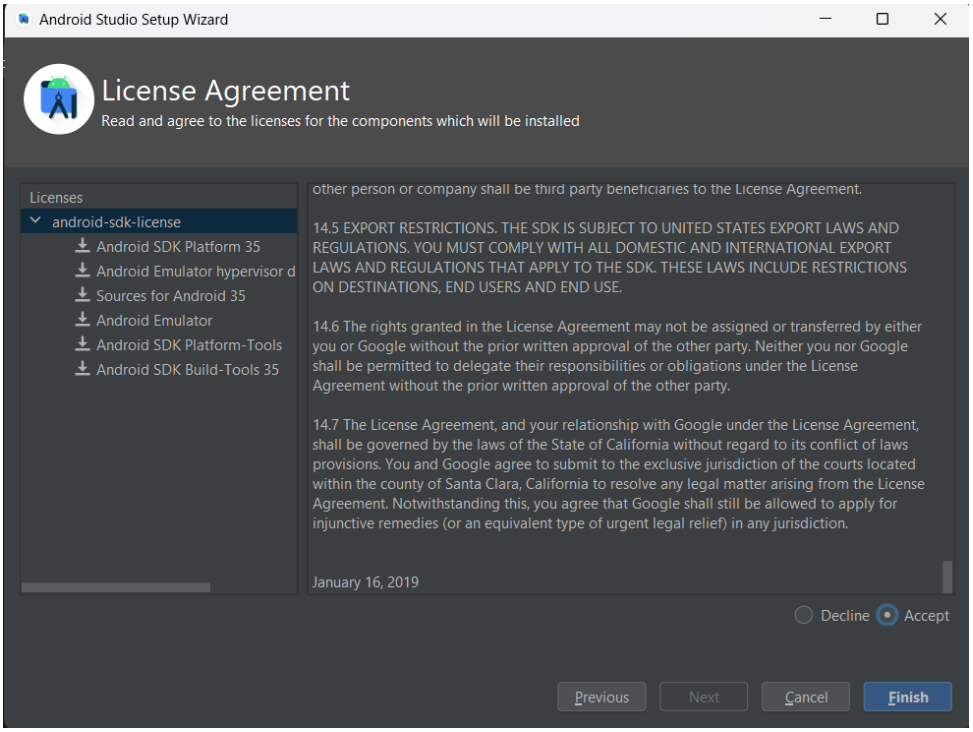


22) **Click "Next."**

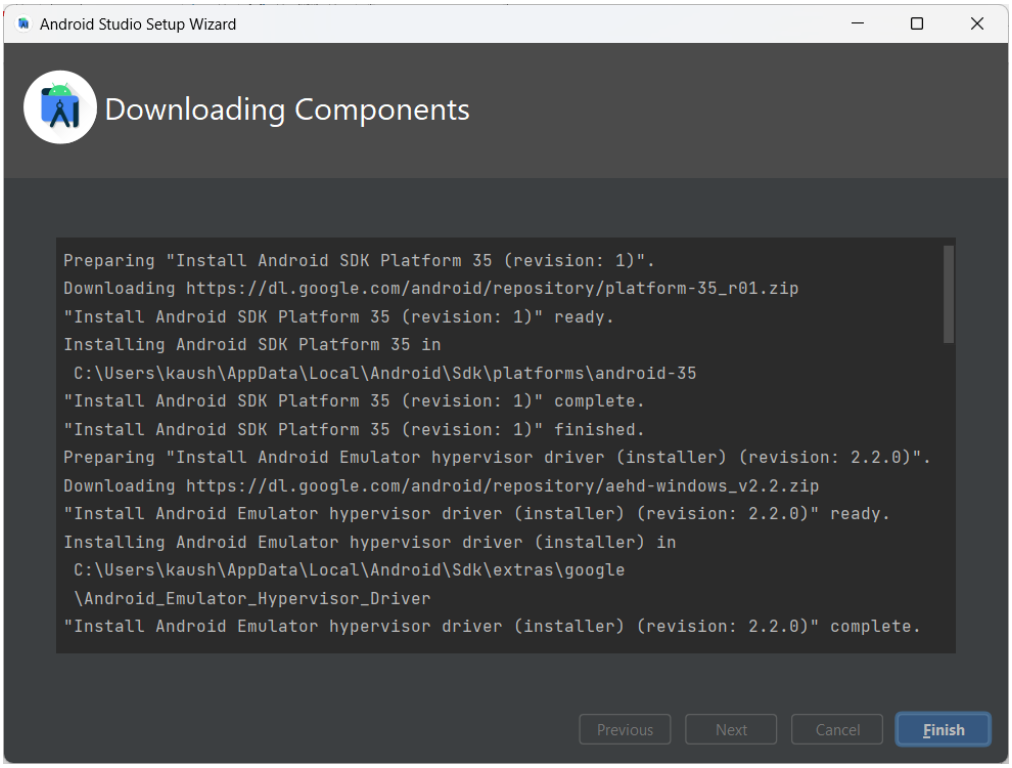
23) Now it is time to download the SDK components.



24) Choose **Accept** and **click on "Finish"**.

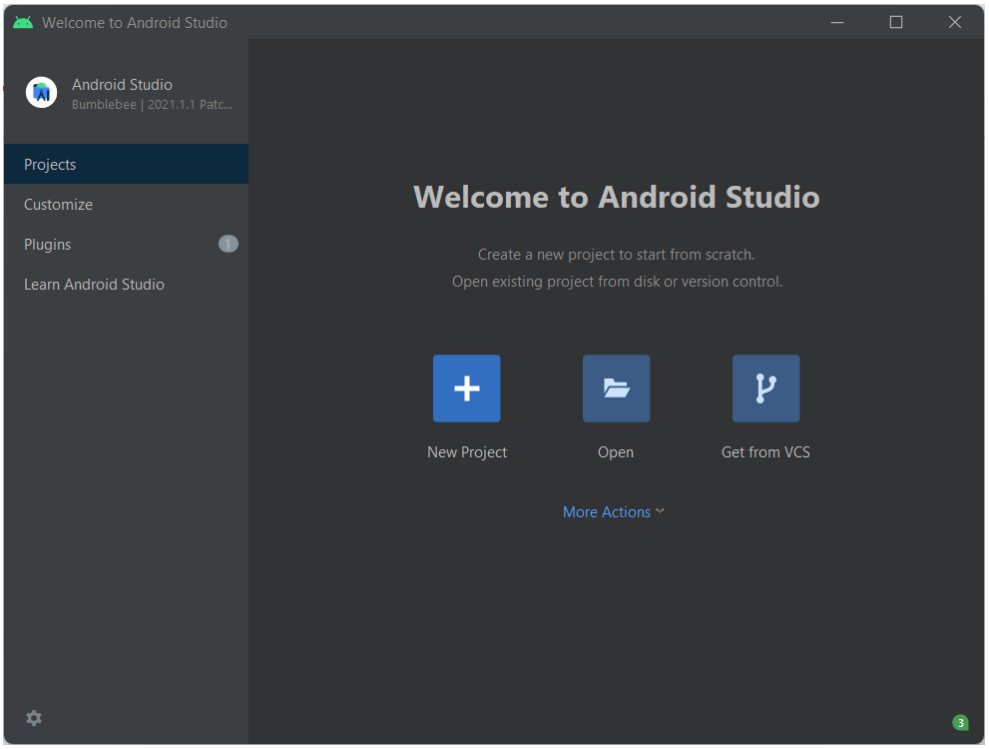


25) Components begin to download let it complete.



26) **Click on the "Finish"** button to launch it.

27) **Click on “New Project”** to build a new app.



PRACTICAL: - 2

Program Definition: - Create an android application to print "Hello World".

PROGRAMS

- **activity_main.xml**

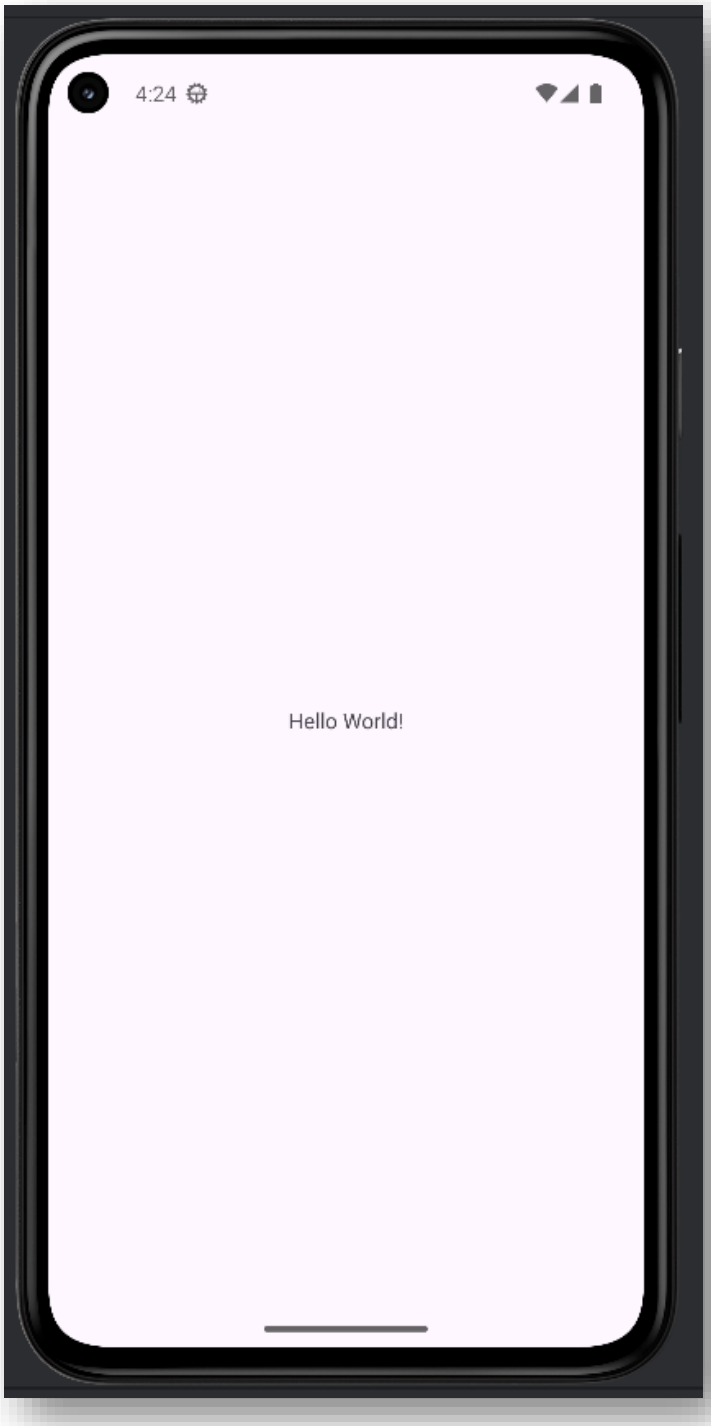
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:id="@+id/main"
   android:layout_width="match_parent"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

   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello World!"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent" />

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

- **MainActivity.java**

```
package com.example.helloworld;


import android.os.Bundle;


import androidx.activity.EdgeToEdge;

import androidx.appcompat.app.AppCompatActivity;

import androidx.core.graphics.Insets;

import androidx.core.view.ViewCompat;
```

```
import androidx.core.view.WindowInsetsCompat;


public class MainActivity extends AppCompatActivity {


   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      EdgeToEdge.enable(this);
      setContentView(R.layout.activity_main);
      ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main),
(v, insets) -> {
         Insets systemBars =
insets.getInsets(WindowInsetsCompat.Type.systemBars());
         v.setPadding(systemBars.left, systemBars.top, systemBars.right,
systemBars.bottom);
         return insets;
      });
   }
}
```

OUTPUT



PRACTICAL: - 3

Program Definition: - Create an android application to accept the first name and second name from user and display the details of the user along with some message after button click.

PROGRAMS

- **activity_main.xml**

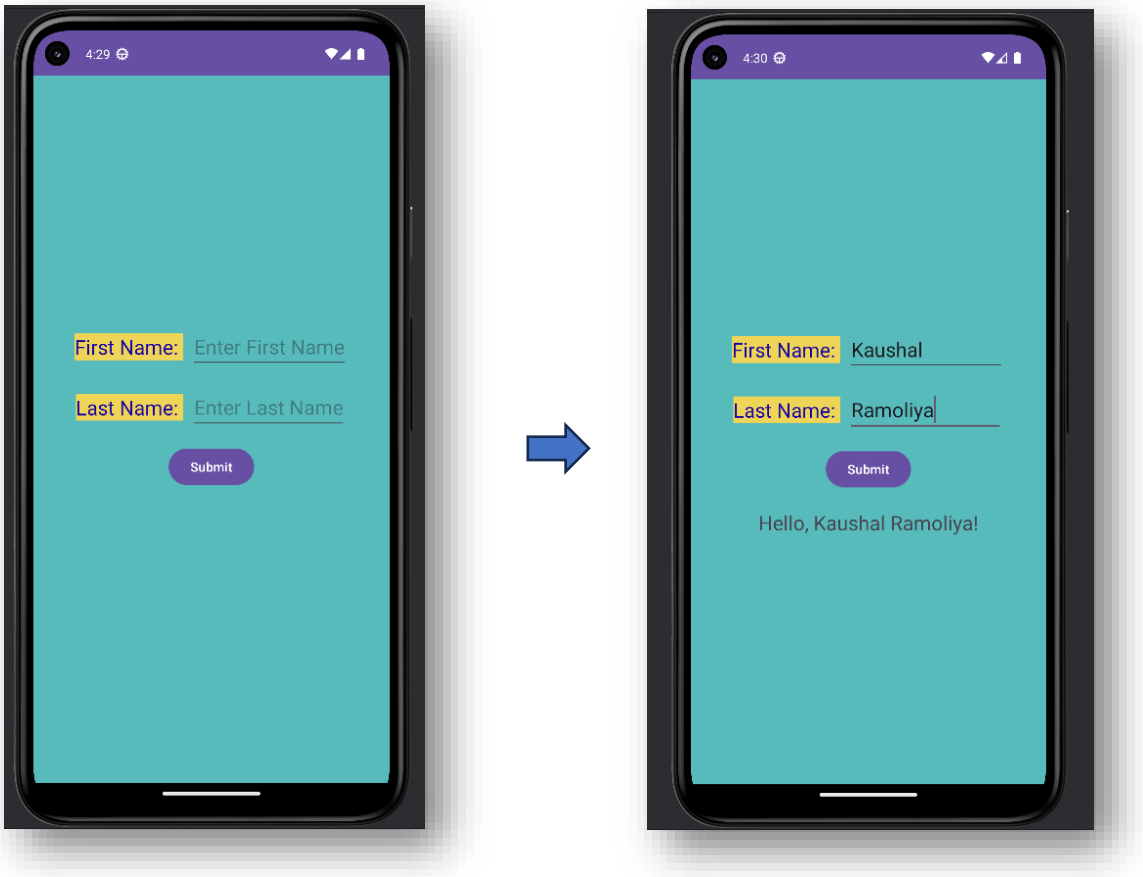
```
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:gravity="center"
   android:padding="16dp"
   android:background="#57BBBC">

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

      <TextView
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="First Name: "
         android:textSize="22sp"
         android:textColor="#1803A5"
         android:background="#EFD557" />

      <EditText
         android:id="@+id/firstNameInput"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:hint="Enter First Name"
         android:inputType="textPersonName"
         android:textSize="22sp"
         android:layout_marginLeft="8dp" />
   </LinearLayout>
```

```
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:gravity="center"
        android:layout_marginTop="16dp">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Last Name: "
            android:textSize="22sp"
            android:textColor="#1803A5"
            android:background="#EFD557" />

        <EditText
            android:id="@+id/lastNameInput"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:hint="Enter Last Name"
            android:inputType="textPersonName"
            android:textSize="22sp"
            android:layout_marginLeft="8dp"
             />
    </LinearLayout>

    <Button
        android:id="@+id/submitButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit"
        android:layout_marginTop="16dp"
         />

    <TextView
        android:id="@+id/resultText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:text=""
        android:textSize="22sp"
        android:gravity="center" />
</LinearLayout>
```

- **MainActivity.java**

```
package com.example.lab_3_name;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

import com.example.lab_3_name.R;

public class MainActivity extends AppCompatActivity {

   private EditText firstNameInput;
   private EditText lastNameInput;
   private TextView resultText;

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

      firstNameInput = findViewById(R.id.firstNameInput);
      lastNameInput = findViewById(R.id.lastNameInput);
      Button submitButton = findViewById(R.id.submitButton);
      resultText = findViewById(R.id.resultText);

      submitButton.setOnClickListener(new View.OnClickListener() {
         @SuppressLint("SetTextI18n")
         @Override
         public void onClick(View v) {
            String firstName = firstNameInput.getText().toString().trim();
            String lastName = lastNameInput.getText().toString().trim();

            String fullName = firstName + " " + lastName;

            resultText.setText("Hello, " + fullName + "!");
         }
      });
   }
}
```

OUTPUT


4:29
First Name:
Enter First Name
Last Name:
Enter Last Name
Submit
4:30
First Name:
Kaushal
Last Name:
Ramoliya
Submit
Hello, Kaushal Ramoliya!

PRACTICAL: - 4

Program Definition: - Create an android application to perform all arithmetic operations. Accept the two numbers from user and calculate the result after button click for particular operation.

PROGRAMS

- **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"
   android:background="#57BBBC">

   <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:gravity="center"
      android:radius="10dp"
      >

      <TextView
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:textSize="22sp"
         android:text="Number1:"
         android:textColor="#1803A5"
         android:background="#EFD557" />

      <EditText
         android:id="@+id/number1Input"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:textSize="22sp"
         android:hint="Enter Number 1"
         android:layout_marginLeft="8dp"
```

```
        android:inputType="number" />

    </LinearLayout>

    <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:gravity="center"
      android:layout_marginTop="10dp">


      <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="22sp"
        android:text="Number2:"
        android:textColor="#1803A5"
        android:background="#EFD557" />

      <EditText
        android:id="@+id/number2Input"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="22sp"
        android:hint="Enter Number 2"
        android:layout_marginLeft="8dp"
        android:inputType="number"/>

    </LinearLayout>

    <Button
      android:id="@+id/addButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Addition"
      android:layout_marginTop="12dp"
      android:textSize="20sp" />

    <Button
      android:id="@+id/subButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Subtraction"
```

```
        android:layout_marginTop="10dp"
        android:textSize="20sp" />

    <Button
        android:id="@+id/mulButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Multiplication"
        android:layout_marginTop="10dp"
        android:textSize="20sp" />

    <Button
        android:id="@+id/divButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Division"
        android:layout_marginTop="10dp"
        android:textSize="20sp" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:textSize="26sp"
        android:text="Result"
        android:textColor="#FFFF"
        android:background="#008000" />

    <EditText
        android:layout_marginTop="5dp"
        android:id="@+id/resultOutput"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="26sp"
        android:hint="Result"
        android:inputType="number" />

</LinearLayout>
```

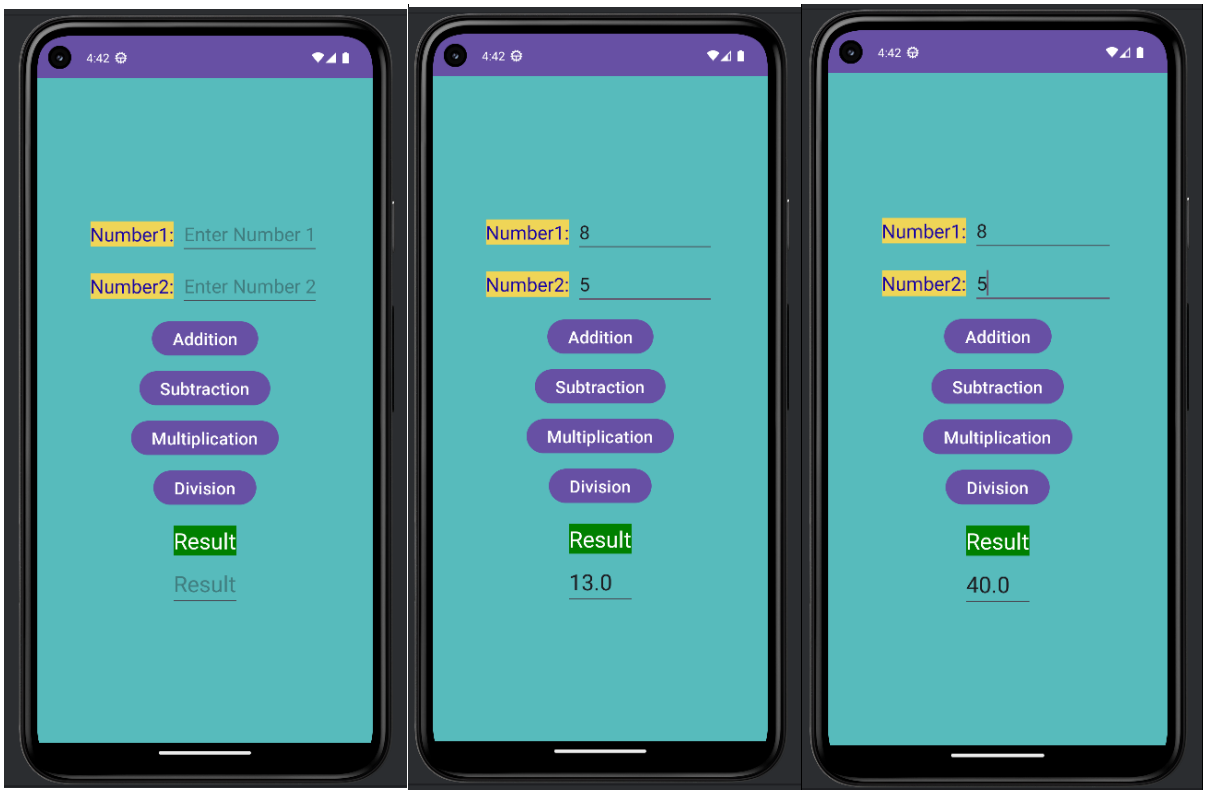
- **MainActivity.java**

```
package com.example.lab_4_calculator;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
   private EditText number1Input;
   private EditText number2Input;
   private EditText resultOutput;

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

      number1Input = findViewById(R.id.number1Input);
      number2Input = findViewById(R.id.number2Input);
      resultOutput = findViewById(R.id.resultOutput);

      Button addButton = findViewById(R.id.addButton);
      Button subButton = findViewById(R.id.subButton);
      Button mulButton = findViewById(R.id.mulButton);
      Button divButton = findViewById(R.id.divButton);

      addButton.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            calculate("+");
         }
      });

      subButton.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            calculate("-");
         }
      });
```

```
        mulButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                calculate("*");
            }
        });

        divButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                calculate("/");
            }
        });
    }

    private void calculate(String operator) {
        String num1 = number1Input.getText().toString();
        String num2 = number2Input.getText().toString();

        if (!num1.isEmpty() && !num2.isEmpty()) {
            double number1 = Double.parseDouble(num1);
            double number2 = Double.parseDouble(num2);
            double result = 0;

            switch (operator) {
                case "+":
                    result = number1 + number2;
                    break;
                case "-":
                    result = number1 - number2;
                    break;
                case "*":
                    result = number1 * number2;
                    break;
                case "/":
                    if (number2 != 0) {
                        result = number1 / number2;
                    } else {
                        resultOutput.setText("Cannot divide by zero");
                        return;
                    }
                    break;
            }
```

```
                resultOutput.setText(String.valueOf(result));
            } else {
                resultOutput.setText("Please enter both numbers");
            }
        }
    }
```

OUTPUT



PRACTICAL: - 5

Program Definition: - Create an android application to calculate simple interest. Accept the Amount, Rate of interest and number of years from user and calculate the simple interest and display it. Also display the total amount after addition of interest.

PROGRAMS

- **activity_main.xml**

```
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:orientation="vertical"
   android:gravity="center"
   android:padding="16dp"
   android:background="#d5dcdb">

   <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="vertical"
      android:layout_marginBottom="150sp">

      <TextView
         android:id="@+id/textView3"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="@string/calculate_simple_interest"
         android:textSize="30sp"
         android:textStyle="bold"/>
   </LinearLayout>



   <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:gravity="center_horizontal"
```

```
    tools:ignore="UselessParent">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:text="@string/ammounttt"
        android:textSize="25sp"
        />

    <EditText
        android:id="@+id/editTextText3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:autofillHints=""
        android:textSize="20sp"
        android:ems="10"
        android:inputType="number"
        android:hint="@string/enter_ammountt" />


</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:gravity="center_horizontal"
    tools:ignore="UselessParent">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="35dp"
        android:text="@string/interestttt"
        tools:ignore="DuplicateIds"
        android:textSize="25sp"/>

    <EditText
        android:id="@+id/editTextText4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:autofillHints=""
        android:textSize="20sp"
        android:ems="10"
        android:inputType="number"
        android:hint="@string/entet_rate_of_interest" />


    </LinearLayout>

    <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:gravity="center_horizontal"
      tools:ignore="UselessParent">

      <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="55dp"
        android:text="@string/yearsss"
        tools:ignore="DuplicateIds"
        android:textSize="25sp"/>

      <EditText
        android:id="@+id/editTextText5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="20sp"
        android:ems="10"
        android:inputType="number"
        android:hint="@string/enter_number_of_years" />


    </LinearLayout>



    <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="vertical"
      android:gravity="center_horizontal"
```

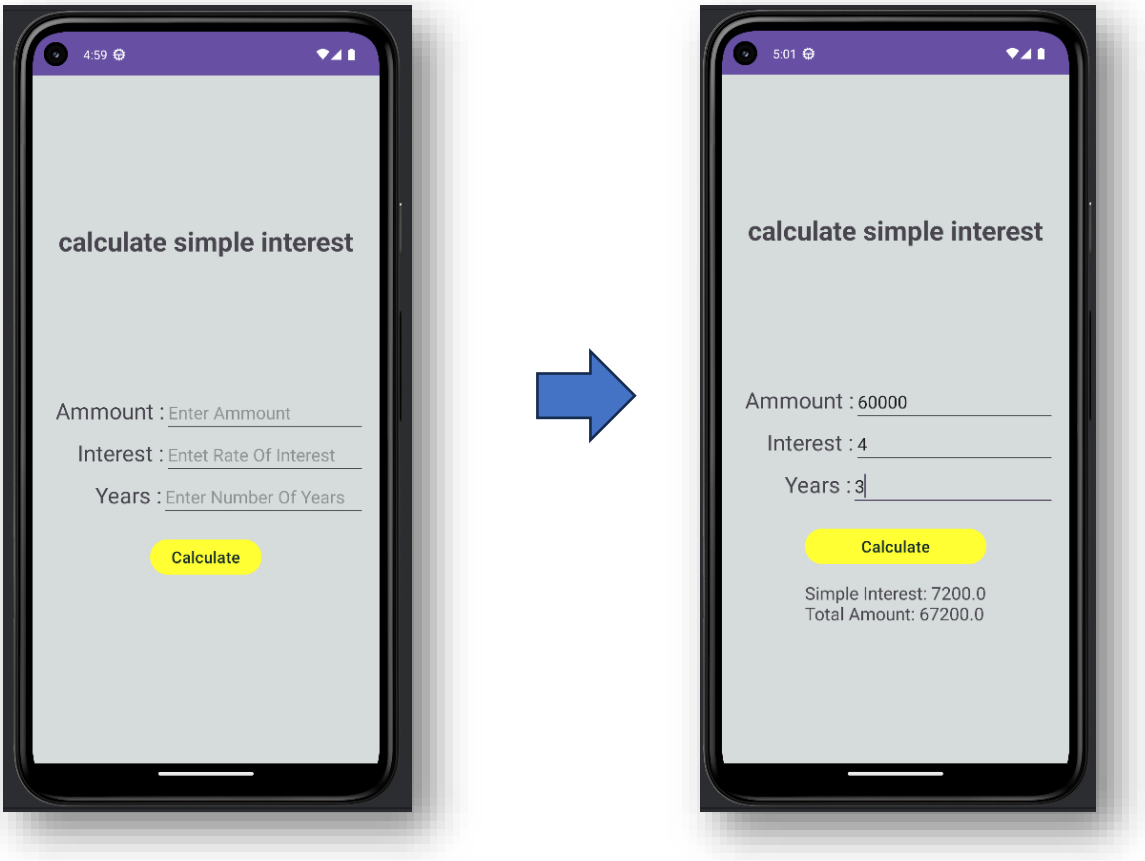
```
        tools:ignore="UselessParent">

        <Button
            android:id="@+id/button"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textSize="18sp"
            android:text="@string/calculate"
            android:layout_marginTop="20dp"
            android:backgroundTint="#ffff33"
            android:textColor="#152d2d"/>

        <TextView
            android:id="@+id/textView2"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text=""
            android:textSize="20sp"
            android:layout_marginTop="15dp"/>

    </LinearLayout>



</LinearLayout>
```

- **MainActivity.java**

```
package com.example.lab_5;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText amountEditText, interestEditText, yearsEditText;
    private TextView resultTextView;

    @Override
```

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

        amountEditText = findViewById(R.id.editTextText3);
        interestEditText = findViewById(R.id.editTextText4);
        yearsEditText = findViewById(R.id.editTextText5);
        Button calculateButton = findViewById(R.id.button);
        resultTextView = findViewById(R.id.textView2);

        calculateButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                calculateSimpleInterest();
            }
        });
    }

    @SuppressLint("SetTextI18n")
    private void calculateSimpleInterest() {
        // Get input values as strings and convert to double
        String amountStr = amountEditText.getText().toString();
        String interestStr = interestEditText.getText().toString();
        String yearsStr = yearsEditText.getText().toString();

        if (amountStr.isEmpty() || interestStr.isEmpty() ||
yearsStr.isEmpty()) {
            resultTextView.setText("Please enter all values.");
            return;
        }

        double principal = Double.parseDouble(amountStr);
        double rate = Double.parseDouble(interestStr);
        double time = Double.parseDouble(yearsStr);

        double simpleInterest = (principal * rate * time) / 100;
        double totalAmount = principal + simpleInterest;

        resultTextView.setText("Simple Interest: " + simpleInterest +
"\nTotal Amount: " + totalAmount);
    }
}
```

OUTPUT


4:59
calculate simple interest
Ammount : Enter Ammount
Interest : Entet Rate Of Interest
Years : Enter Number Of Years
Calculate
5:01
calculate simple interest
Ammount : 60000
Interest : 4
Years : 3
Calculate
Simple Interest: 7200.0
Total Amount: 67200.0

PRACTICAL: - 6

Program Definition: - Create an android application to change the background color, Text Size and Text Color after each button click.

PROGRAMS

- **activity_main.xml**

```
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:orientation="vertical"
   android:gravity="center"
   android:padding="16dp"
   android:background="#d5dcdb">

   <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="vertical"
      android:layout_marginBottom="150sp">

      <TextView
         android:id="@+id/textView3"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="@string/calculate_simple_interest"
         android:textSize="30sp"
         android:textStyle="bold"/>
   </LinearLayout>



   <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:gravity="center_horizontal"
      tools:ignore="UselessParent">
```

```
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:text="@string/ammounttt"
        android:textSize="25sp"
        />

    <EditText
        android:id="@+id/editTextText3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:autofillHints=""
        android:textSize="20sp"
        android:ems="10"
        android:inputType="number"
        android:hint="@string/enter_ammountt" />


</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:gravity="center_horizontal"
    tools:ignore="UselessParent">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="35dp"
        android:text="@string/interestttt"
        tools:ignore="DuplicateIds"
        android:textSize="25sp"/>

    <EditText
        android:id="@+id/editTextText4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:autofillHints=""
```

```
        android:textSize="20sp"
        android:ems="10"
        android:inputType="number"
        android:hint="@string/entet_rate_of_interest" />


    </LinearLayout>

    <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:gravity="center_horizontal"
      tools:ignore="UselessParent">

      <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="55dp"
        android:text="@string/yearsss"
        tools:ignore="DuplicateIds"
        android:textSize="25sp"/>

      <EditText
        android:id="@+id/editTextText5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="20sp"
        android:ems="10"
        android:inputType="number"
        android:hint="@string/enter_number_of_years" />


    </LinearLayout>



    <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="vertical"
      android:gravity="center_horizontal"
      tools:ignore="UselessParent">
```

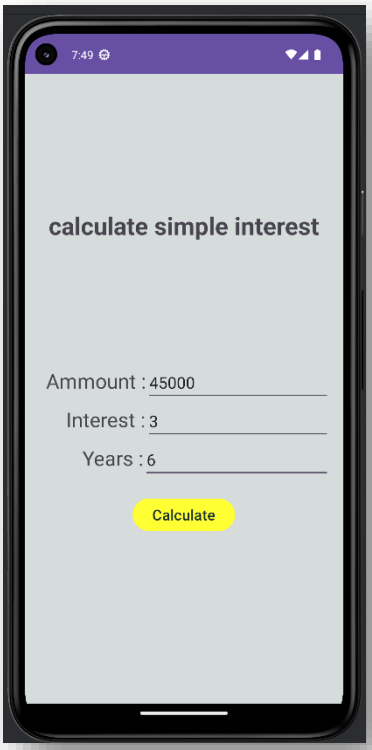
```
        <Button
            android:id="@+id/button"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textSize="18sp"
            android:text="@string/calculate"
            android:layout_marginTop="20dp"
            android:backgroundTint="#ffff33"
            android:textColor="#152d2d"/>

        <TextView
            android:id="@+id/textView2"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text=""
            android:textSize="20sp"
            android:layout_marginTop="15dp"/>

    </LinearLayout>

</LinearLayout>
```

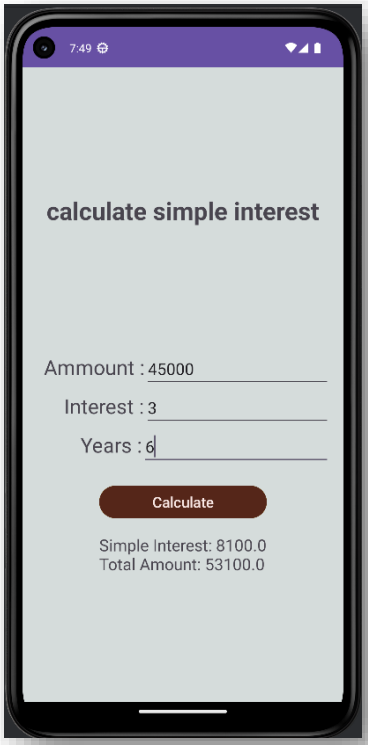
- **MainActivity.java**

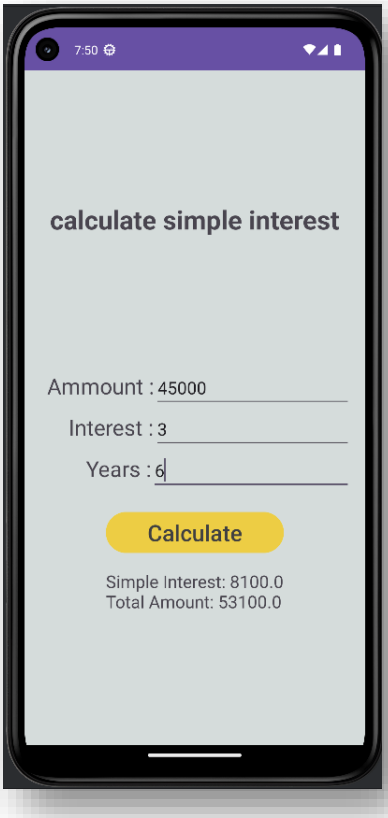
```
package com.example.lab_5;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText amountEditText, interestEditText, yearsEditText;
    private TextView resultTextView;

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

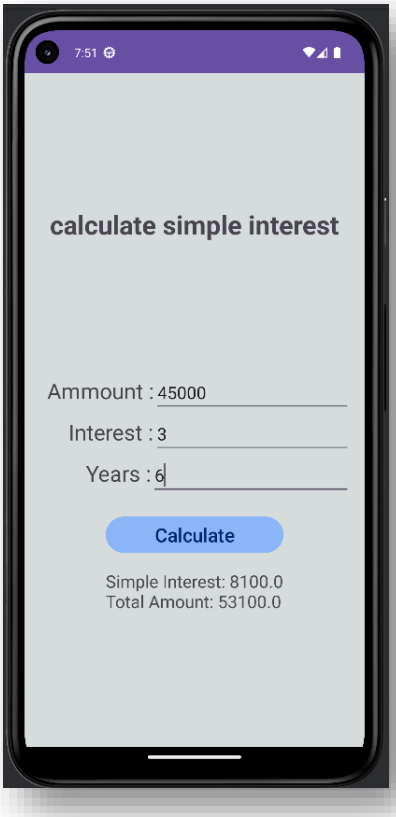
```
        amountEditText = findViewById(R.id.editTextText3);
        interestEditText = findViewById(R.id.editTextText4);
        yearsEditText = findViewById(R.id.editTextText5);
        Button calculateButton = findViewById(R.id.button);
        resultTextView = findViewById(R.id.textView2);

        calculateButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                calculateSimpleInterest();
            }
        });
    }

    @SuppressLint("SetTextI18n")
    private void calculateSimpleInterest() {
        // Get input values as strings and convert to double
        String amountStr = amountEditText.getText().toString();
        String interestStr = interestEditText.getText().toString();
        String yearsStr = yearsEditText.getText().toString();

        if (amountStr.isEmpty() || interestStr.isEmpty() ||
yearsStr.isEmpty()) {
            resultTextView.setText("Please enter all values.");
            return;
        }

        double principal = Double.parseDouble(amountStr);
        double rate = Double.parseDouble(interestStr);
        double time = Double.parseDouble(yearsStr);

        double simpleInterest = (principal * rate * time) / 100;
        double totalAmount = principal + simpleInterest;

        resultTextView.setText("Simple Interest: " + simpleInterest +
"\nTotal Amount: " + totalAmount);
    }
}
```

OUTPUT


7:49
calculate simple interest
Ammount : 45000
Interest : 3
Years : 6
Calculate


7:49
calculate simple interest
Ammount : 45000
Interest : 3
Years : 6
Calculate
Simple Interest: 8100.0
Total Amount: 53100.0


7:50
calculate simple interest
Ammount : 45000
Interest : 3
Years : 6
Calculate
Simple Interest: 8100.0
Total Amount: 53100.0


7:51
calculate simple interest
Ammount : 45000
Interest : 3
Years : 6
Calculate
Simple Interest: 8100.0
Total Amount: 53100.0

PRACTICAL: - 7

Program Definition: - Create an android application to design calculator to perform all operations. Make the use of Linear and relative layout to design the application.

PROGRAMS

- **activity_main.xml**

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

   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_alignParentTop="true"
      android:layout_alignParentEnd="true"
      android:layout_marginTop="120dp"
      android:orientation="vertical">

      <TextView
         android:id="@+id/textView"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:gravity="center"
         android:textSize="40sp"
         android:textColor="#11bf60"
         android:textStyle="bold"
         android:text="@string/calculator" />
   </LinearLayout>

   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_alignParentStart="true"
      android:layout_alignParentTop="true"
      android:layout_marginStart="7dp"
      android:layout_marginTop="330dp"
      android:layout_marginEnd="10dp"
      android:orientation="vertical"
      android:padding="10dp">
```

```
    <EditText
        android:id="@+id/editTextText2"
        android:layout_width="match_parent"
        android:layout_height="60dp"
        android:autofillHints="display"
        android:background="#99eff2"
        android:gravity="end"
        android:inputType="number"
        android:textSize="34sp" />
</LinearLayout>

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentTop="true"
    android:layout_alignParentEnd="true"
    android:layout_marginTop="450dp"
    android:orientation="vertical">

    <!-- First Row -->
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <Button
            android:id="@+id/acid"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/ac"
            android:layout_margin="6dp"
            android:textSize="20sp" />

        <Button
            android:id="@+id/delid"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/del"
            android:layout_margin="6dp"
            android:textSize="20sp" />

        <Button
            android:id="@+id/percentageid"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/per"
```

```
            android:layout_margin="6dp"
            android:textSize="20sp" />

        <Button
            android:id="@+id/slesh"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/slesh"
            android:layout_margin="6dp"
            android:textSize="20sp" />
    </LinearLayout>

    <!-- Second Row -->
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <Button
            android:id="@+id/id7"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/_7"
            android:layout_margin="6dp"
            android:textSize="20sp" />

        <Button
            android:id="@+id/id8"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/_8"
            android:layout_margin="6dp"
            android:textSize="20sp" />

        <Button
            android:id="@+id/id9"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/_9"
            android:layout_margin="6dp"
            android:textSize="20sp" />

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

```
        android:text="@string/multipliation"
        android:layout_margin="6dp"
        android:textSize="20sp"/>
    </LinearLayout>

    <!-- Third Row -->
    <LinearLayout
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:orientation="horizontal">

       <Button
          android:id="@+id/id4"
          android:layout_width="wrap_content"
          android:layout_height="wrap_content"
          android:text="@string/_4"
          android:layout_margin="6dp"
          android:textSize="20sp" />

       <Button
          android:id="@+id/id5"
          android:layout_width="wrap_content"
          android:layout_height="wrap_content"
          android:text="@string/_5"
          android:layout_margin="6dp"
          android:textSize="20sp" />

       <Button
          android:id="@+id/id6"
          android:layout_width="wrap_content"
          android:layout_height="wrap_content"
          android:text="@string/_6"
          android:layout_margin="6dp"
          android:textSize="20sp"/>

       <Button
          android:id="@+id/subid"
          android:layout_width="wrap_content"
          android:layout_height="wrap_content"
          android:text="@string/subtraction"
          android:layout_margin="6dp"
          android:textSize="20sp"/>
    </LinearLayout>

    <!-- Fourth Row -->
    <LinearLayout
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal">

    <Button
        android:id="@+id/id1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/_1"
        android:layout_margin="6dp"
        android:textSize="20sp" />

    <Button
        android:id="@+id/id2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/_2"
        android:layout_margin="6dp"
        android:textSize="20sp" />

    <Button
        android:id="@+id/id3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/_3"
        android:layout_margin="6dp"
        android:textSize="20sp"/>

    <Button
        android:id="@+id/addid"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/addition"
        android:layout_margin="6dp"
        android:textSize="20sp"/>
</LinearLayout>

<!-- Fifth Row -->
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal">

    <Button
        android:id="@+id/id0"
        android:layout_width="wrap_content"
```

```
            android:layout_height="wrap_content"
            android:layout_margin="6dp"
            android:text="@string/_0"
            android:textSize="20sp"/>

        <Button
            android:id="@+id/pntid"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="6dp"
            android:text="@string/point"
            android:textSize="20sp" />

        <Button
            android:id="@+id/eqlid"
            android:layout_width="187dp"
            android:layout_height="wrap_content"
            android:layout_margin="6dp"
            android:text="@string/equal"
            android:textSize="20sp" />
    </LinearLayout>
  </LinearLayout>
</RelativeLayout>
```

- **MainActivity.java**

```
package com.example.lab_7_calculator;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;
import java.util.Stack;

public class MainActivity extends AppCompatActivity {

  private EditText editText;
  private String expression = "";

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

    editText = findViewById(R.id.editTextText2);
```

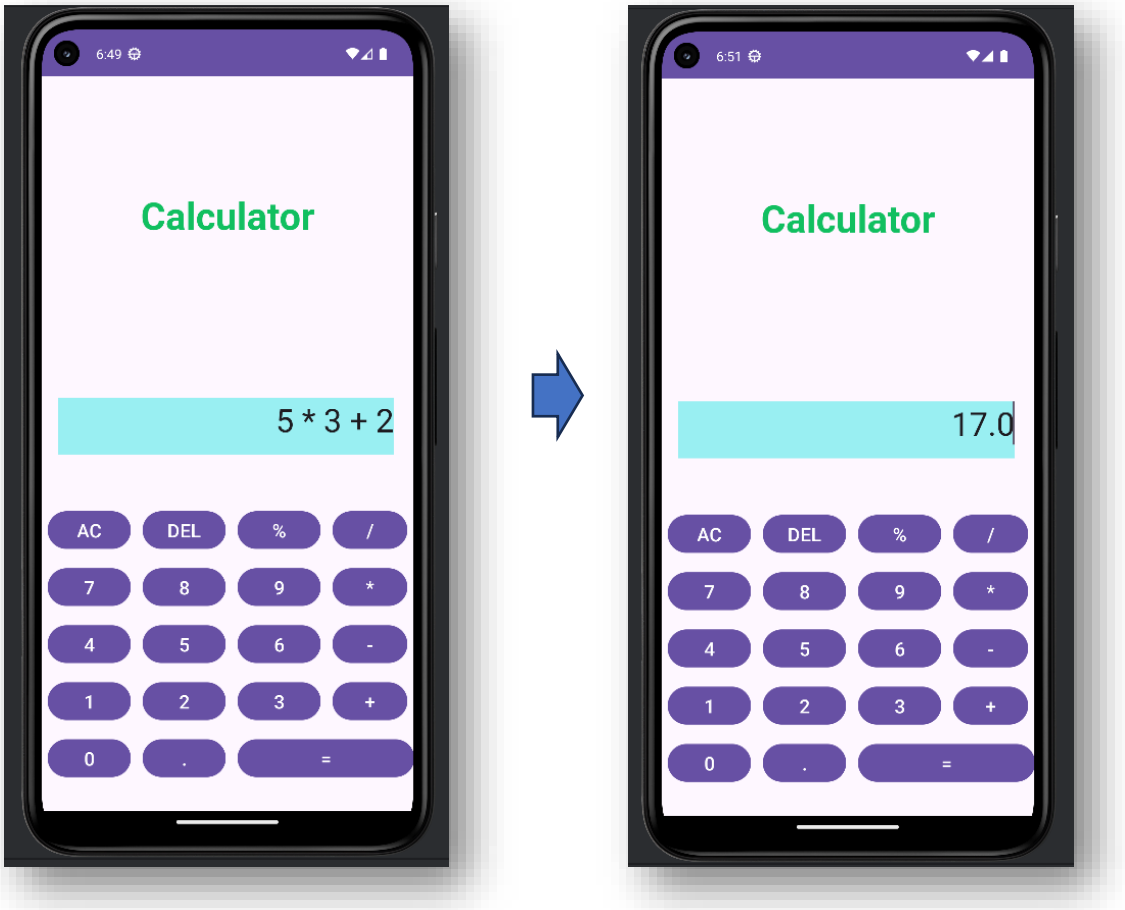
```
// Button Initialization
Button btn0 = findViewById(R.id.id0);
Button btn1 = findViewById(R.id.id1);
Button btn2 = findViewById(R.id.id2);
Button btn3 = findViewById(R.id.id3);
Button btn4 = findViewById(R.id.id4);
Button btn5 = findViewById(R.id.id5);
Button btn6 = findViewById(R.id.id6);
Button btn7 = findViewById(R.id.id7);
Button btn8 = findViewById(R.id.id8);
Button btn9 = findViewById(R.id.id9);
Button btnAdd = findViewById(R.id.addid);
Button btnSub = findViewById(R.id.subid);
Button btnMul = findViewById(R.id.mulid);
Button btnDiv = findViewById(R.id.slesh);
Button btnMod = findViewById(R.id.percentageid);
Button btnEquals = findViewById(R.id.eqlid);
Button btnClear = findViewById(R.id.acid);
Button btnDelete = findViewById(R.id.delid);
Button btnPoint = findViewById(R.id.pntid);

// Number Button Listeners
View.OnClickListener numberClickListener = v -> {
   Button b = (Button) v;
   expression += b.getText().toString();
   editText.setText(expression);
};

btn0.setOnClickListener(numberClickListener);
btn1.setOnClickListener(numberClickListener);
btn2.setOnClickListener(numberClickListener);
btn3.setOnClickListener(numberClickListener);
btn4.setOnClickListener(numberClickListener);
btn5.setOnClickListener(numberClickListener);
btn6.setOnClickListener(numberClickListener);
btn7.setOnClickListener(numberClickListener);
btn8.setOnClickListener(numberClickListener);
btn9.setOnClickListener(numberClickListener);

// Operator Button Listeners
btnAdd.setOnClickListener(v -> onOperatorClick("+"));
btnSub.setOnClickListener(v -> onOperatorClick("-"));
btnMul.setOnClickListener(v -> onOperatorClick("*"));
btnDiv.setOnClickListener(v -> onOperatorClick("/"));
btnMod.setOnClickListener(v -> onOperatorClick("%"));
```

```
        // Equals Button Listener
        btnEquals.setOnClickListener(v -> onEqualClick());

        // Clear Button Listener
        btnClear.setOnClickListener(v -> clearAll());

        // Delete Button Listener
        btnDelete.setOnClickListener(v -> deleteLastChar());

        // Decimal Point Button Listener
        btnPoint.setOnClickListener(v -> appendDecimal());
    }

    private void onOperatorClick(String op) {
        if (!expression.isEmpty() && !"+-
*/%".contains(String.valueOf(expression.charAt(expression.length() - 1)))) {
            expression += " " + op + " ";
            editText.setText(expression);
        }
    }

    @SuppressLint("SetTextI18n")
    private void onEqualClick() {
        try {
            double result = evaluateExpression(expression);
            expression = String.valueOf(result);
            editText.setText(expression);
        } catch (Exception e) {
            editText.setText("Error");
            clearAll();
        }
    }

    private double evaluateExpression(String expr) throws Exception {
        // Use a stack-based approach to evaluate the expression
        Stack<Double> values = new Stack<>();
        Stack<Character> ops = new Stack<>();

        for (int i = 0; i < expr.length(); i++) {
            char c = expr.charAt(i);

            if (Character.isDigit(c)) {
                StringBuilder sb = new StringBuilder();
                while (i < expr.length() && (Character.isDigit(expr.charAt(i)) ||
expr.charAt(i) == '.')) {
```

```
                sb.append(expr.charAt(i++));
            }
            i--;
            values.push(Double.parseDouble(sb.toString()));
        } else if (c == '(') {
            ops.push(c);
        } else if (c == ')') {
            while (ops.peek() != '(') {
                values.push(applyOp(ops.pop(), values.pop(), values.pop()));
            }
            ops.pop();
        } else if (c == '+' || c == '-' || c == '*' || c == '/' || c == '%') {
            while (!ops.empty() && precedence(c) <= precedence(ops.peek()))
{
                values.push(applyOp(ops.pop(), values.pop(), values.pop()));
            }
            ops.push(c);
        }
    }

    while (!ops.empty()) {
        values.push(applyOp(ops.pop(), values.pop(), values.pop()));
    }

    return values.pop();
  }

  private int precedence(char op) {
    switch (op) {
        case '+':
        case '-':
            return 1;
        case '*':
        case '/':
        case '%':
            return 2;
    }
    return -1;
  }

  private double applyOp(char op, double b, double a) {
    switch (op) {
        case '+':
            return a + b;
        case '-':
            return a - b;
```

```
            case '*':
                return a * b;
            case '/':
                if (b != 0) {
                    return a / b;
                }
                throw new UnsupportedOperationException("Cannot divide by
zero");
            case '%':
                return a % b;
        }
        return 0;
    }

    private void appendDecimal() {
        if (expression.isEmpty() || "+-
*/%".contains(String.valueOf(expression.charAt(expression.length() - 1)))) {
            expression += "0.";
        } else if (!expression.contains(".")) {
            expression += ".";
        }
        editText.setText(expression);
    }

    private void clearAll() {
        expression = "";
        editText.setText("");
    }

    private void deleteLastChar() {
        if (!expression.isEmpty()) {
            expression = expression.substring(0, expression.length() - 1);
            if (expression.endsWith(" ")) {
                expression = expression.substring(0, expression.length() - 1);
            }
            editText.setText(expression);
        }
    }
}
```

OUTPUT


6:49
Calculator
5 * 3 + 2
AC
DEL
%
/
7
8
9
*
4
5
6
-
1
2
3
+
0
.
=
6:51
Calculator
17.0
AC
DEL
%
/
7
8
9
*
4
5
6
-
1
2
3
+
0
.
=

PRACTICAL: - 8

Program Definition: - Create an Android application to demonstrate the use of Intent for navigating between two activities. Accept a message from the user in the first activity and pass it to the second activity using Intent. Display the message in the second activity after the button click.

PROGRAMS

- **activity_main.xml-1**

```
<?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"
   android:background="#faf0ca">

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


   </LinearLayout>


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

      <TextView
         android:id="@+id/textView3"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="@string/intent_activity"
         android:layout_marginTop="100sp"
         android:textSize="40sp"
```

```
    android:gravity="center"
    android:textColor="#0d3b66"
    android:textStyle="bold"/>

  <LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:orientation="vertical"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    tools:ignore="MissingConstraints"
    android:layout_marginTop="80sp"
    tools:layout_editor_absoluteY="200dp">

    <TextView
      android:id="@+id/textView2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:gravity="center"
      android:layout_marginBottom="20sp"
      android:textSize="25sp"
      android:textStyle="bold"
      android:textColor="#f4d35e"
      android:text="@string/explicit_intent"
      tools:ignore="DuplicateIds" />

    <EditText
      android:id="@+id/editTextText"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:autofillHints=""
      android:ems="10"
      android:gravity="center"
      android:inputType="text"
      android:hint="@string/write_here"
      tools:ignore="LabelFor,MissingConstraints" />

    <Button
      android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/send"
      tools:ignore="MissingConstraints" />
  </LinearLayout>
```

```
<View
    android:layout_width="match_parent"
    android:layout_height="1dp"
    android:background="#CCCCCC"
    android:layout_marginTop="100sp"
    />

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="80sp"
    android:gravity="center"
    android:orientation="vertical"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    tools:ignore="MissingConstraints"
    tools:layout_editor_absoluteY="400dp">

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="20sp"
        android:gravity="center"
        android:text="@string/implicit_intent"
        android:textColor="#f4d35e"
        android:textSize="25sp"
        android:textStyle="bold" />

    <EditText
        android:id="@+id/link_edit_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:autofillHints=""
        android:ems="10"
        android:gravity="center"
        android:hint="@string/search_here"
        android:inputType="text"
        tools:ignore="LabelFor,MissingConstraints" />

    <Button
        android:id="@+id/search_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/search_btn"
        tools:ignore="MissingConstraints" />
```

```
        </LinearLayout>

    </LinearLayout>

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

- **MainActivity.java -1**

```
package com.example.lab_8_intent_activity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.net.Uri;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {

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

        Button send_btn = findViewById(R.id.button);
```

```
        EditText send_txt = findViewById(R.id.editTextText);


        send_btn.setOnClickListener(view -> {
            String str = send_txt.getText().toString();
            Intent intent =new
Intent(getApplicationContext(),MainActivity2.class);
            intent.putExtra("message_key", str);
            startActivity(intent);
        });


        EditText link_text = findViewById(R.id.link_edit_text);
        Button search_btn = findViewById(R.id.search_button);


        search_btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String url = link_text.getText().toString();
                Intent intentserch = new Intent(Intent.ACTION_VIEW,
Uri.parse(url));
                startActivity(intentserch);
            }
        });
    }
}
```

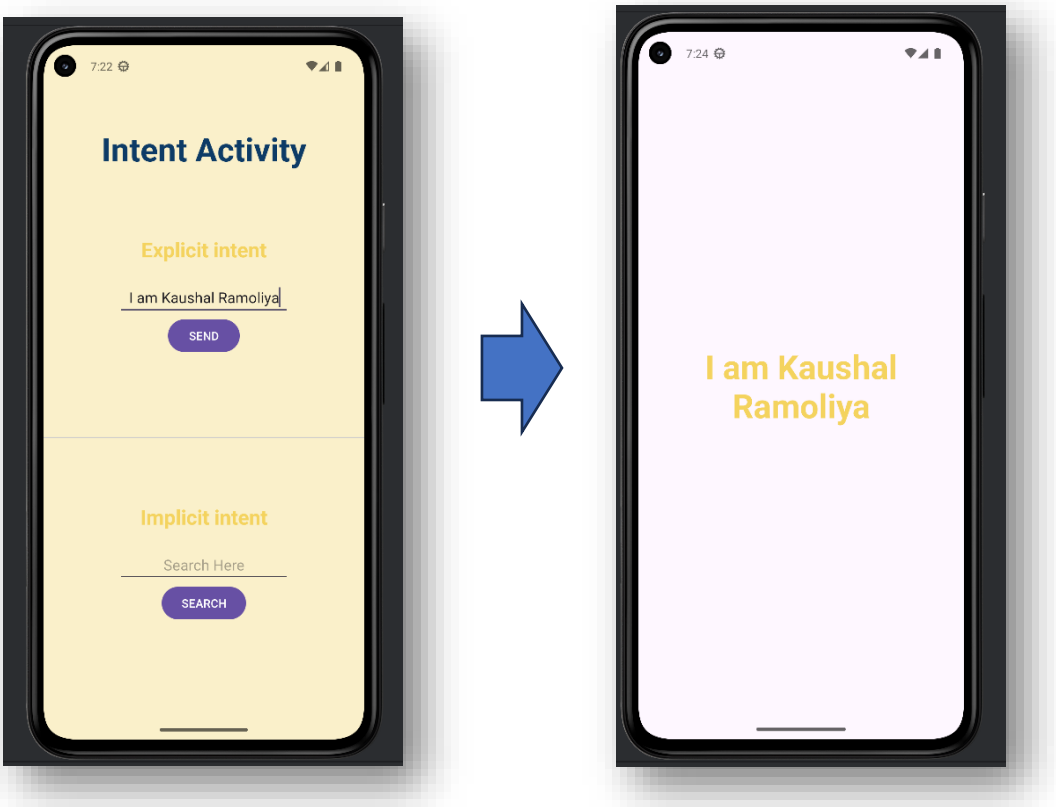
- **activity_main.xml-2**

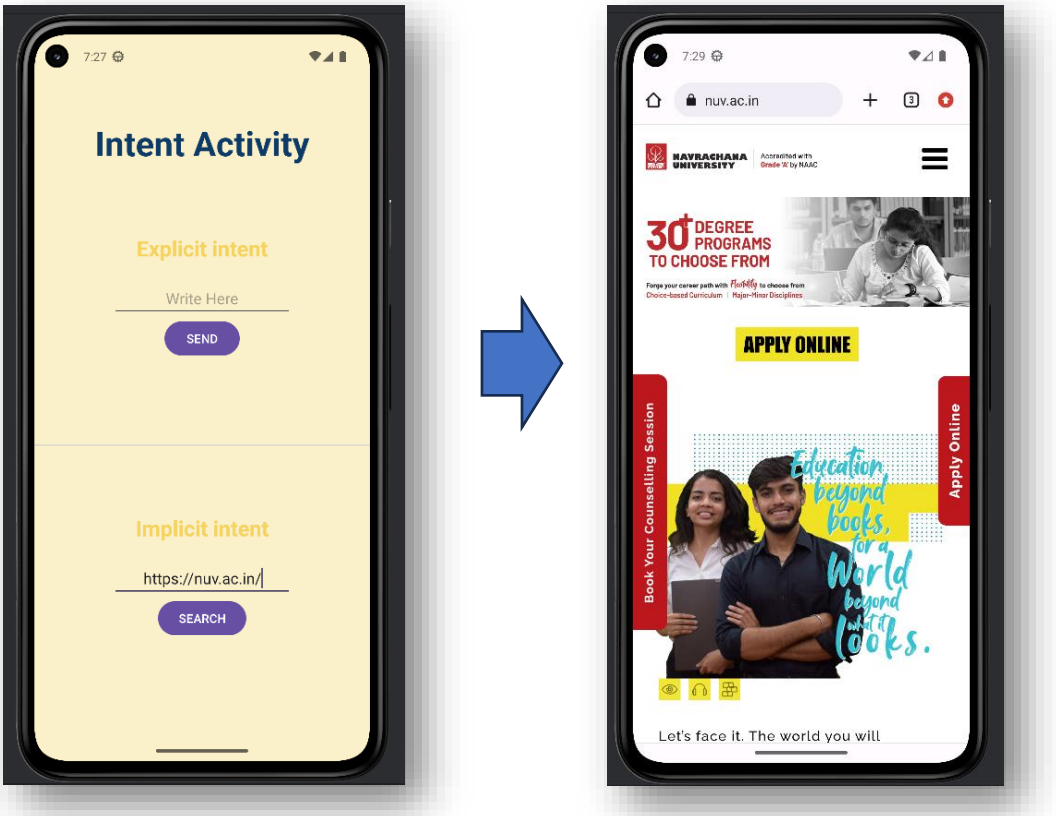
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:id="@+id/main"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity2"
   android:background="#faf0ca">

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

      <TextView
         android:id="@+id/textView"
         android:layout_width="match_parent"
         android:layout_height="match_parent"
         android:gravity="center"
         android:textSize="40sp"
         android:textColor="#f4d35e"
         android:textStyle="bold"
         app:layout_constraintEnd_toEndOf="parent"
         app:layout_constraintStart_toStartOf="parent"
         tools:ignore="MissingConstraints"/>

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

- **MainActivity.java -2**

```
package com.example.lab_8_intent_activity;

import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity2 extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main2);
        TextView receved_msg = findViewById(R.id.textView);

        Intent intent = getIntent();
        String str = intent.getStringExtra("message_key");
        receved_msg.setText(str);
    }
}
```

OUTPUT


7:22
Intent Activity
Explicit intent
I am Kaushal Ramoliya
SEND
Implicit intent
Search Here
SEARCH
7:24
I am Kaushal Ramoliya


7:27
Intent Activity
Explicit intent
Write Here
SEND
Implicit intent
https://nuv.ac.in/
SEARCH
7:29
nuv.ac.in
NAVRACHANA UNIVERSITY
30+ DEGREE PROGRAMS TO CHOOSE FROM
APPLY ONLINE
Book Your Counselling Session
Apply Online
Education beyond books, for a World beyond books.
Let's face it. The world you will

PRACTICAL: - 9

Program Definition: - Create an android application to create a registration form to accept first name, last name, gender, email id, contact no and submit button. Display the details after clicking on submit button and display error message if all the fields are not filled and make the use of table layout to arrange the elements in registration form.

PROGRAMS

- **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:gravity="center"
   android:orientation="vertical"
   android:background="#002366"
   tools:context=".MainActivity">

   <TableLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content">

      <TableRow>
         <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="First Name"
            android:textSize="18sp"
            android:textColor="#FFFFFF"
            android:textStyle="bold"
            android:padding="8dp"/>
         <EditText
            android:id="@+id/etFirstName"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textSize="18sp"
```

```
        android:hint="Enter First Name"
        android:textColor="#FFFFFF"
        android:textColorHint="#B0B0B0" />
    </TableRow>

    <TableRow>
      <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Last Name"
        android:textSize="18sp"
        android:textColor="#FFFFFF"
        android:textStyle="bold"
        android:padding="8dp"/>
      <EditText
        android:id="@+id/etLastName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="18sp"
        android:hint="Enter Last Name"
        android:textColor="#FFFFFF"
        android:textColorHint="#B0B0B0" />
    </TableRow>

    <TableRow>
      <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Gender"
        android:textSize="18sp"
        android:textColor="#FFFFFF"
        android:textStyle="bold"
        android:padding="8dp"/>
      <EditText
        android:id="@+id/etGender"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="18sp"
        android:hint="Enter Gender (M/F)"
        android:textColor="#FFFFFF"
        android:textColorHint="#B0B0B0" />
    </TableRow>

    <TableRow>
```

```
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Email ID"
        android:textSize="18sp"
        android:textColor="#FFFFFF"
        android:textStyle="bold"
        android:padding="8dp"/>
    <EditText
        android:id="@+id/etEmail"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="18sp"
        android:hint="Enter Email ID"
        android:textColor="#FFFFFF"
        android:textColorHint="#B0B0B0" />
</TableRow>

<TableRow>
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Contact No"
        android:textSize="18sp"
        android:textColor="#FFFFFF"
        android:textStyle="bold"
        android:padding="8dp"/>
    <EditText
        android:id="@+id/etContact"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="18sp"
        android:inputType="phone"
        android:hint="Enter Contact No"
        android:textColor="#FFFFFF"
        android:textColorHint="#B0B0B0" />
</TableRow>

<TableRow
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:gravity="center">

    <Button
```

```
            android:id="@+id/btnSubmit"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Submit"
            android:textSize="18sp"
            android:textStyle="bold"
            android:backgroundTint="#FFFFFF"
            android:textColor="#002366" />
        </TableRow>

    </TableLayout>
</LinearLayout>
```

- **MainActivity.java**

```
package com.example.registrationform;

import android.content.Intent;
import android.os.Bundle;
import android.text.TextUtils;
import android.util.Patterns;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText etFirstName, etLastName, etGender, etEmail, etContact;
    private Button btnSubmit;

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

        etFirstName = findViewById(R.id.etFirstName);
        etLastName = findViewById(R.id.etLastName);
        etGender = findViewById(R.id.etGender);
        etEmail = findViewById(R.id.etEmail);
        etContact = findViewById(R.id.etContact);
        btnSubmit = findViewById(R.id.btnSubmit);
```

```
        btnSubmit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                String firstName = etFirstName.getText().toString().trim();
                String lastName = etLastName.getText().toString().trim();
                String gender = etGender.getText().toString().trim();
                String email = etEmail.getText().toString().trim();
                String contact = etContact.getText().toString().trim();


                if (TextUtils.isEmpty(firstName)) {
                    Toast.makeText(MainActivity.this, "Please enter your first name.",
Toast.LENGTH_SHORT).show();
                } else if (!firstName.matches("[a-zA-Z]+")) {
                    Toast.makeText(MainActivity.this, "First name should contain only
letters.", Toast.LENGTH_SHORT).show();
                } else if (TextUtils.isEmpty(lastName)) {
                    Toast.makeText(MainActivity.this, "Please enter your last name.",
Toast.LENGTH_SHORT).show();
                } else if (!lastName.matches("[a-zA-Z]+")) {
                    Toast.makeText(MainActivity.this, "Last name should contain only
letters.", Toast.LENGTH_SHORT).show();
                } else if (TextUtils.isEmpty(gender)) {
                    Toast.makeText(MainActivity.this, "Please enter your gender.",
Toast.LENGTH_SHORT).show();
                } else if (!(gender.equalsIgnoreCase("M") ||
gender.equalsIgnoreCase("F"))) {
                    Toast.makeText(MainActivity.this, "Gender must be 'M' or 'F'.",
Toast.LENGTH_SHORT).show();
                } else if (TextUtils.isEmpty(email)) {
                    Toast.makeText(MainActivity.this, "Please enter your email.",
Toast.LENGTH_SHORT).show();
                } else if (!Patterns.EMAIL_ADDRESS.matcher(email).matches()) {
                    Toast.makeText(MainActivity.this, "Please enter a valid email
address.", Toast.LENGTH_SHORT).show();
                } else if (TextUtils.isEmpty(contact)) {
                    Toast.makeText(MainActivity.this, "Please enter your contact
number.", Toast.LENGTH_SHORT).show();
                } else if (!contact.matches("\\d+")) {
                    Toast.makeText(MainActivity.this, "Contact number should
contain only numbers.", Toast.LENGTH_SHORT).show();
                } else if (contact.length() != 10) {
```

```
                Toast.makeText(MainActivity.this, "Contact number should be
        exactly 10 digits.", Toast.LENGTH_SHORT).show();
            } else {

                Intent intent = new Intent(MainActivity.this, MainActivity2.class);
                intent.putExtra("firstName", firstName);
                intent.putExtra("lastName", lastName);
                intent.putExtra("gender", gender);
                intent.putExtra("email", email);
                intent.putExtra("contact", contact);
                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"
  android:background="#002366">

  <TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Form Submitted"
    android:textSize="22sp"
    android:textStyle="bold"
    android:textColor="#FFFFFF"
    android:paddingBottom="16dp"/>

  <LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:background="@drawable/border_background"
    android:padding="16dp">
```

```
        <TextView
            android:id="@+id/tvDisplay"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textSize="18sp"
            android:textColor="#FFFFFF" />
    </LinearLayout>
</LinearLayout>
```

- **@drawable/border_background.xml**

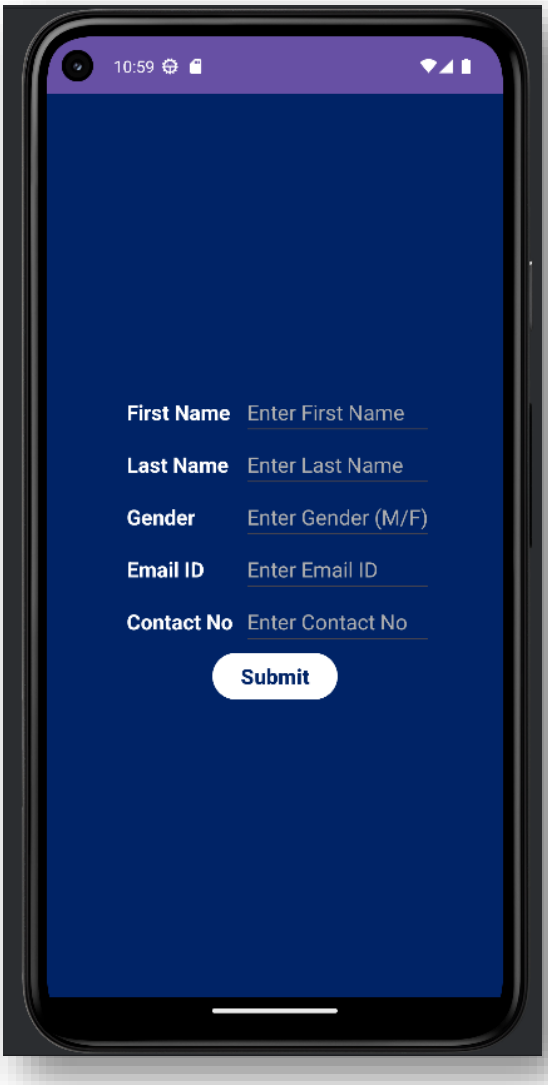
```
<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
    <solid android:color="#0d51d4" />
    <corners android:radius="8dp" />
    <stroke
        android:width="2dp"
        android:color="#000000" />
</shape>
```

- **MainActivity2.java**

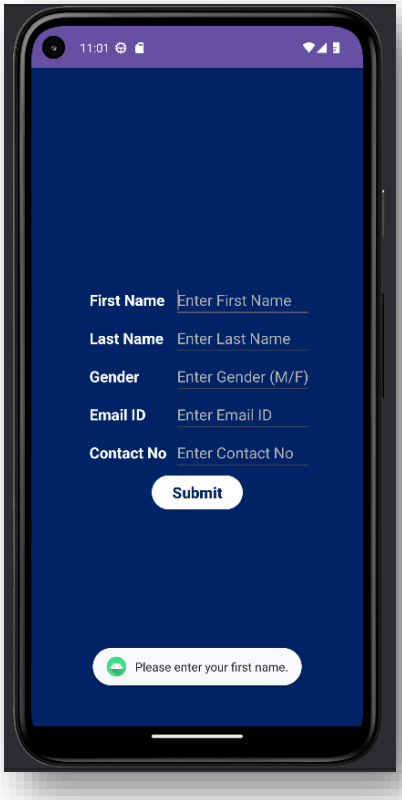
```
package com.example.registrationform;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity2 extends AppCompatActivity {

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

        @SuppressLint({"MissingInflatedId", "LocalSuppress"}) TextView
tvDisplay = findViewById(R.id.tvDisplay);

        // Retrieve data passed from MainActivity
        String firstName = getIntent().getStringExtra("firstName");
        String lastName = getIntent().getStringExtra("lastName");
        String gender = getIntent().getStringExtra("gender");
        String email = getIntent().getStringExtra("email");
        String contact = getIntent().getStringExtra("contact");
```

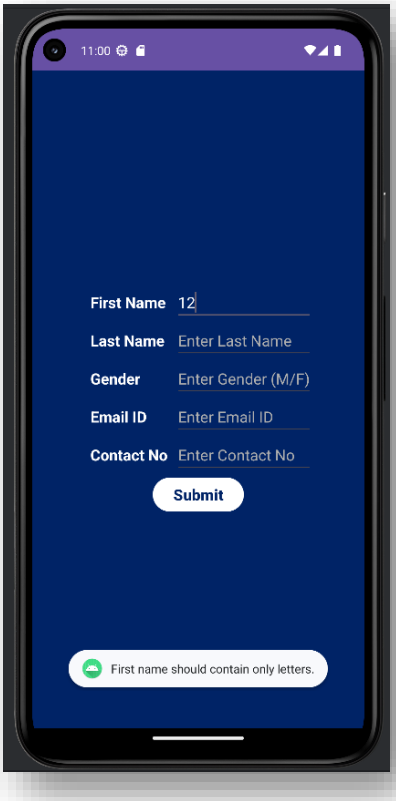
```
            // Display the data
            String displayText = "First Name: " + firstName + "\n" +
                    "Last Name: " + lastName + "\n" +
                    "Gender: " + gender + "\n" +
                    "Email ID: " + email + "\n" +
                    "Contact No: " + contact;
            tvDisplay.setText(displayText);
        }
    }
```

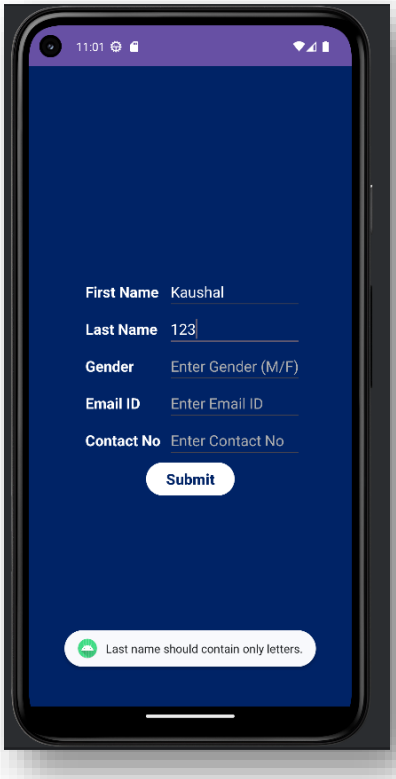
OUTPUT

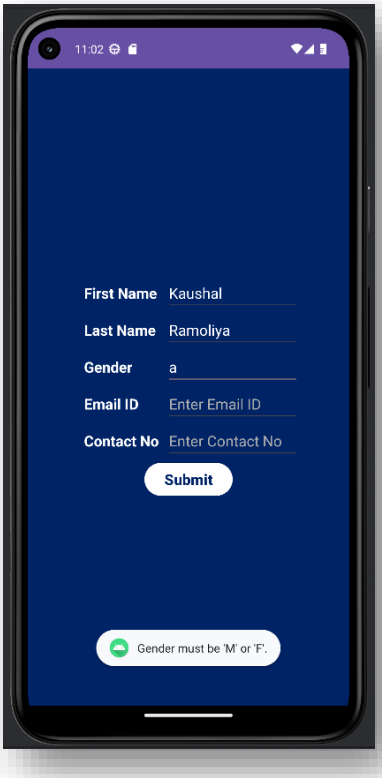


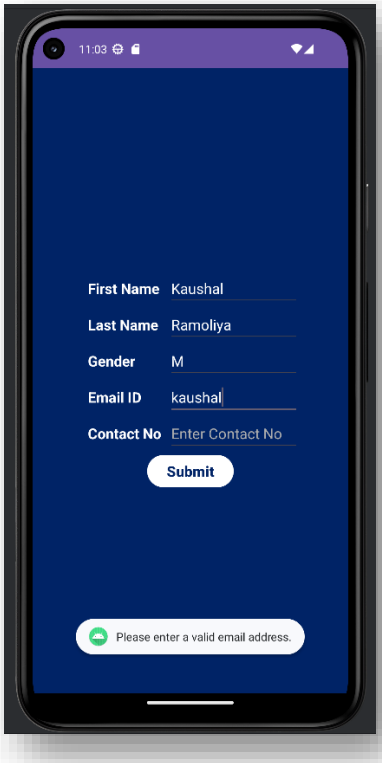
Some error message if all the fields are not filled or wrong fields

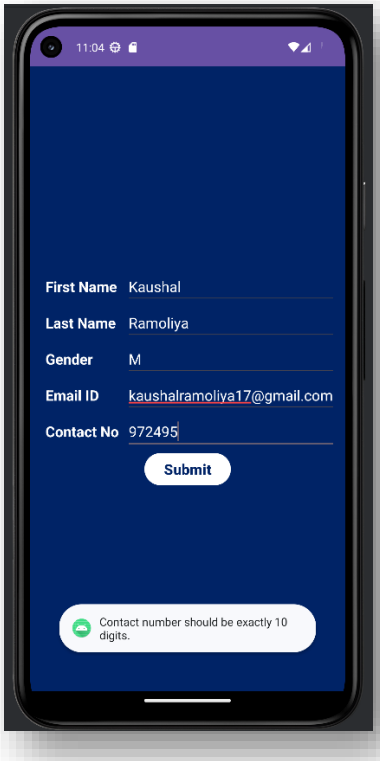


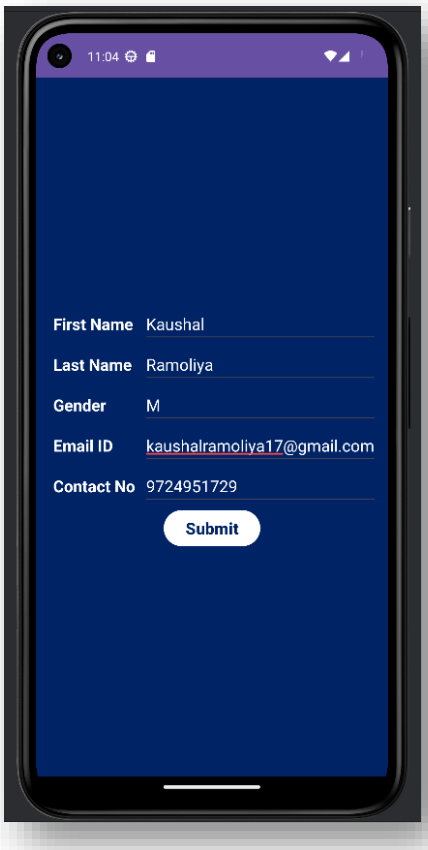







11:03
First Name Kaushal
Last Name Ramoliya
Gender M
Email ID kaushal
Contact No Enter Contact No
Submit
Please enter a valid email address.


11:04
First Name Kaushal
Last Name Ramoliya
Gender M
Email ID kaushalramoliya17@gmail.com
Contact No 972495
Submit
Contact number should be exactly 10 digits.


11:04
First Name Kaushal
Last Name Ramoliya
Gender M
Email ID kaushalramoliya17@gmail.com
Contact No 9724951729
Submit


11:05
Form Submitted
First Name: Kaushal
Last Name: Ramoliya
Gender: M
Email ID: kaushalramoliya17@gmail
.com
Contact No: 9724951729

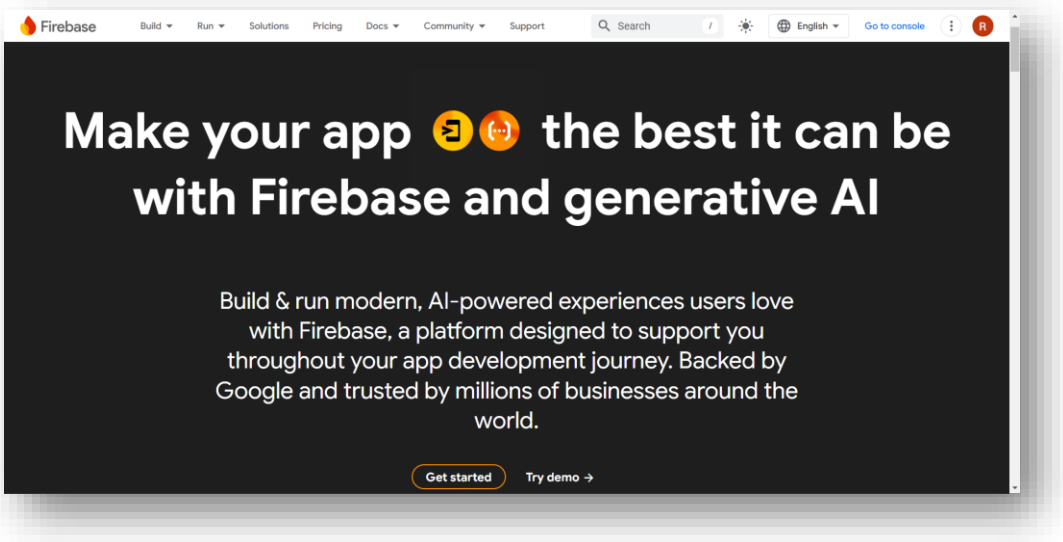
PRACTICAL: - 10

Program Definition: - Create an android application, from above practical & now create a backend using firebase and implement login and signup using firebase services with fire-store and authentication.

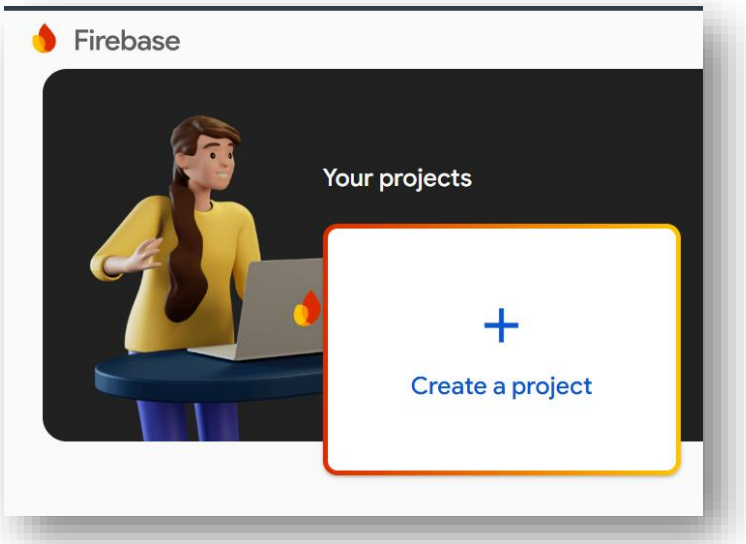
Step 1: Set Up Firebase Project

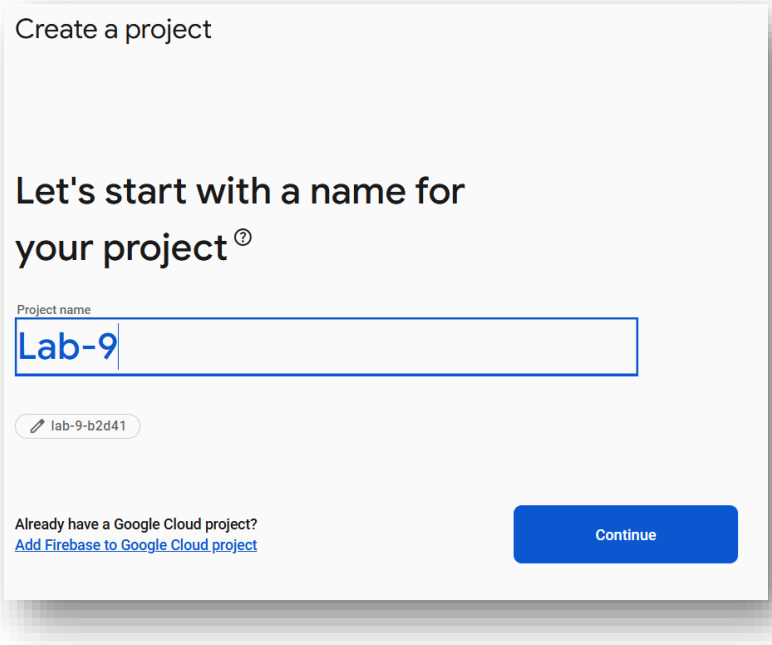
1. **Create a Firebase Project:**

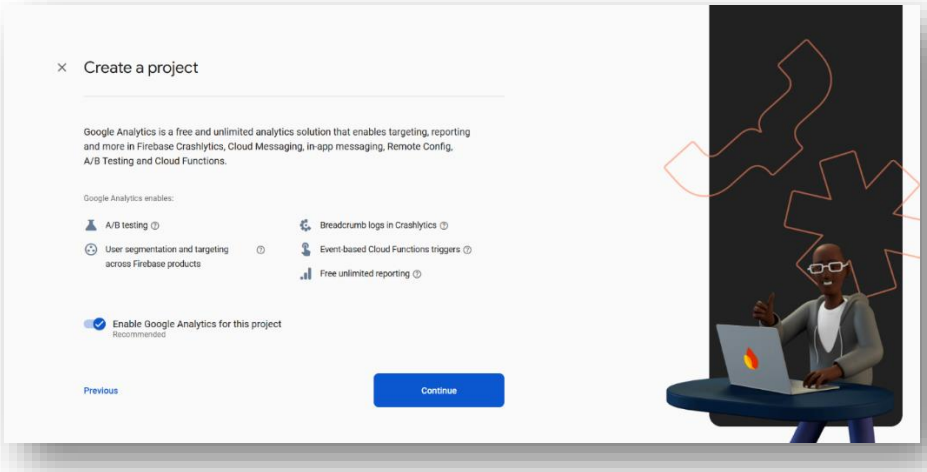
   - Go to the Firebase Console.

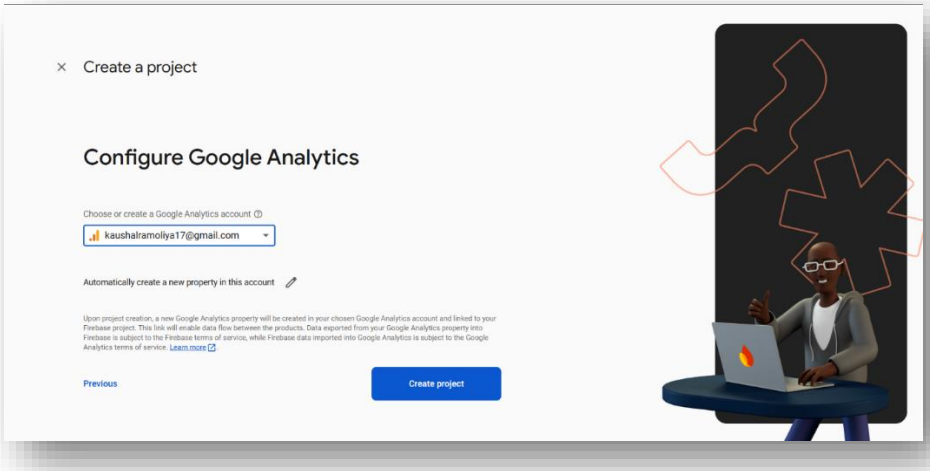


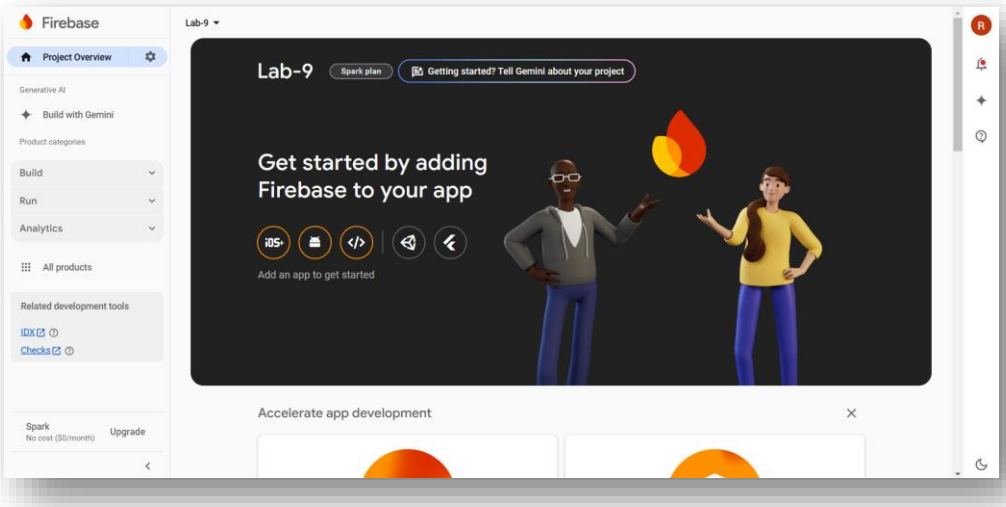
   - Click on "Add project" and follow the setup process.




Create a project
Let's start with a name for your project
Project name
Lab-9
lab-9-b2d41
Already have a Google Cloud project?
Add Firebase to Google Cloud project
Continue

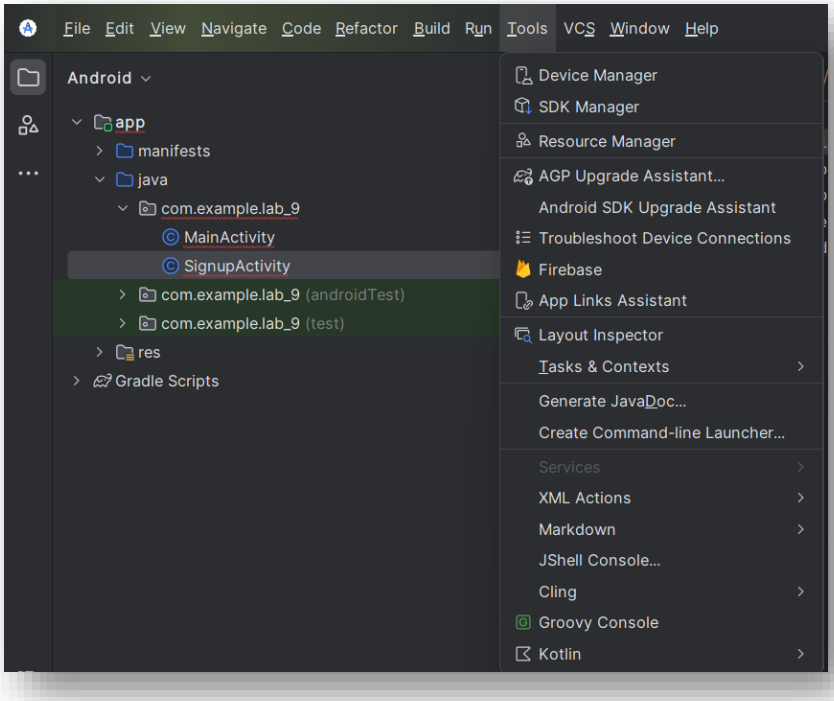

Create a project
Google Analytics is a free and unlimited analytics solution that enables targeting, reporting and more in Firebase Crashlytics, Cloud Messaging, in-app messaging, Remote Config, A/B Testing and Cloud Functions.
Google Analytics enables:
A/B testing
User segmentation and targeting across Firebase products
Breadcrumb logs in Crashlytics
Event-based Cloud Functions triggers
Free unlimited reporting
Enable Google Analytics for this project
Recommended
Previous
Continue

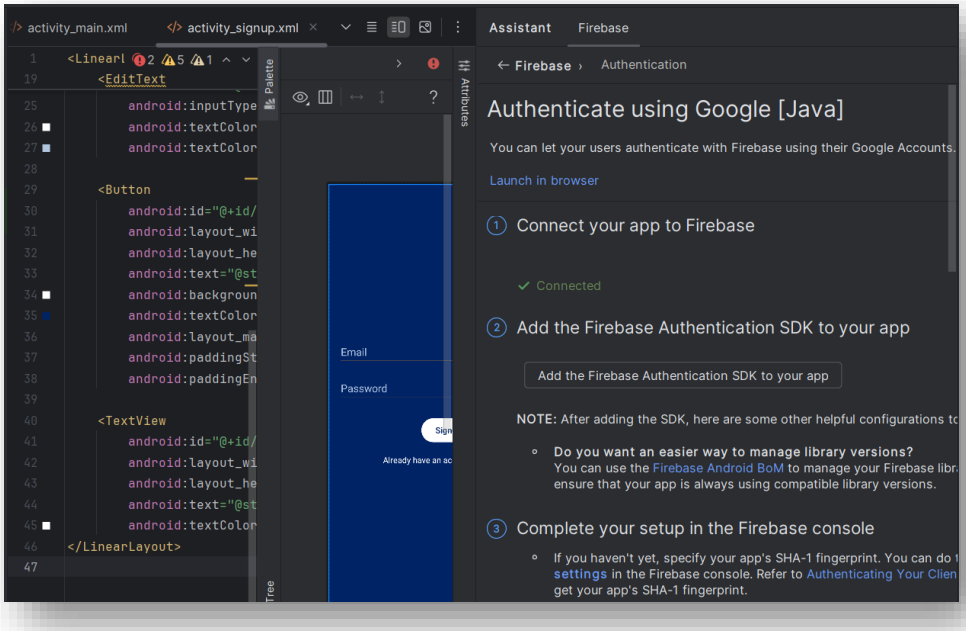

Create a project
Configure Google Analytics
Choose or create a Google Analytics account
kaushalramoliya17@gmail.com
Automatically create a new property in this account
Previous
Create project

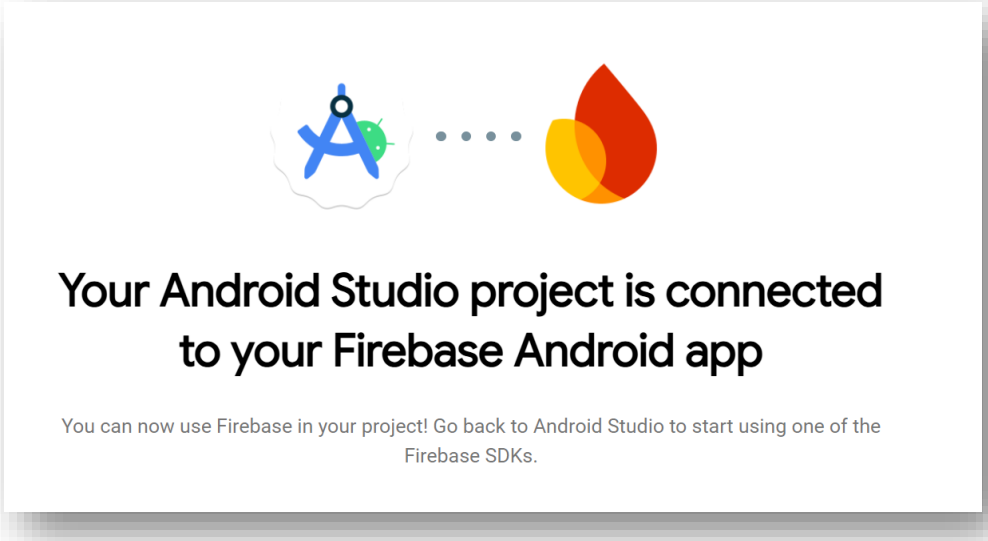


2. Enable Firebase Authentication:

- Connect Your App into firebase




activity_main.xml
activity_signup.xml
Assistant
Firebase
Firebase › Authentication
Authenticate using Google [Java]
You can let your users authenticate with Firebase using their Google Accounts.
Launch in browser
1 Connect your app to Firebase
Connected
2 Add the Firebase Authentication SDK to your app
Add the Firebase Authentication SDK to your app
NOTE: After adding the SDK, here are some other helpful configurations tc
Do you want an easier way to manage library versions?
You can use the Firebase Android BoM to manage your Firebase libr
ensure that your app is always using compatible library versions.
3 Complete your setup in the Firebase console
If you haven't yet, specify your app's SHA-1 fingerprint. You can do
settings in the Firebase console. Refer to Authenticating Your Clien
get your app's SHA-1 fingerprint.
Email
Password
Already have an ac
Palette
Attributes
Tree


Your Android Studio project is connected to your Firebase Android app
You can now use Firebase in your project! Go back to Android Studio to start using one of the Firebase SDKs.

Step 3: Create Layouts for Login and Signup

PROGRAMS

- **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"
   android:gravity="center"
   android:background="#002366">

   <EditText
      android:id="@+id/emailEditText"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_marginBottom="16dp"
      android:hint="@string/email_"
      android:textColor="#FFFFFF"
      android:textColorHint="#B0C4DE" />

   <EditText
      android:id="@+id/passwordEditText"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_marginBottom="24dp"
      android:hint="@string/password_"
      android:inputType="textPassword"
      android:textColor="#FFFFFF"
      android:textColorHint="#B0C4DE" />

   <Button
      android:id="@+id/loginButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/login_"
      android:backgroundTint="#FFFFFF"
      android:textColor="#002366"
      android:layout_marginBottom="16dp"
      android:paddingStart="24dp"
      android:paddingEnd="24dp" />
```

```
    <TextView
        android:id="@+id/signupRedirectText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/don_t_have_an_account_sign_up_here_"
        android:textColor="#FFFFFF" />
</LinearLayout>
```

- **MainActivity.java**

```
package com.example.lab_9;

import android.content.Intent;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import com.example.lab_9.R;
import com.google.firebase.auth.FirebaseAuth;

public class MainActivity extends AppCompatActivity {

    private FirebaseAuth auth;

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

```
        auth = FirebaseAuth.getInstance();

        EditText emailEditText = findViewById(R.id.emailEditText);
        EditText passwordEditText = findViewById(R.id.passwordEditText);
        Button loginButton = findViewById(R.id.loginButton);
        TextView signupRedirectText = findViewById(R.id.signupRedirectText);

        loginButton.setOnClickListener(v -> {
            String email = emailEditText.getText().toString().trim();
            String password = passwordEditText.getText().toString().trim();

            auth.signInWithEmailAndPassword(email, password)
                    .addOnCompleteListener(task -> {
                        if (task.isSuccessful()) {
                            Toast.makeText(MainActivity.this, "Login successful!",
Toast.LENGTH_SHORT).show();
                            startActivity(new Intent(MainActivity.this,
MainActivity.class));
                            finish();
                        } else {
                            Toast.makeText(MainActivity.this, "Login failed: " +
task.getException().getMessage(), Toast.LENGTH_LONG).show();
                        }
                    });
        });

        signupRedirectText.setOnClickListener(v -> startActivity(new
Intent(MainActivity.this, SignupActivity.class)));
    }
}
```

- **activity_signup.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"
  android:gravity="center"
  android:background="#002366">

  <EditText
    android:id="@+id/emailEditText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="16dp"
    android:hint="@string/email__"
    android:textColor="#FFFFFF"
    android:textColorHint="#B0C4DE" />

  <EditText
    android:id="@+id/passwordEditText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="24dp"
    android:hint="@string/password__"
    android:inputType="textPassword"
    android:textColor="#FFFFFF"
    android:textColorHint="#B0C4DE" />

  <Button
    android:id="@+id/signupButton"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/sign_up"
    android:backgroundTint="#FFFFFF"
    android:textColor="#002366"
    android:layout_marginBottom="16dp"
    android:paddingStart="24dp"
    android:paddingEnd="24dp" />

  <TextView
    android:id="@+id/loginRedirectText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

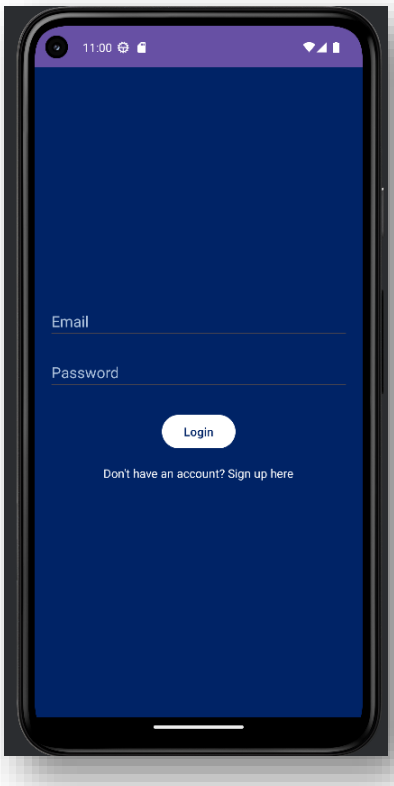
```
        android:text="@string/already_have_an_account_login_here__"
        android:textColor="#FFFFFF" />
    </LinearLayout>
```

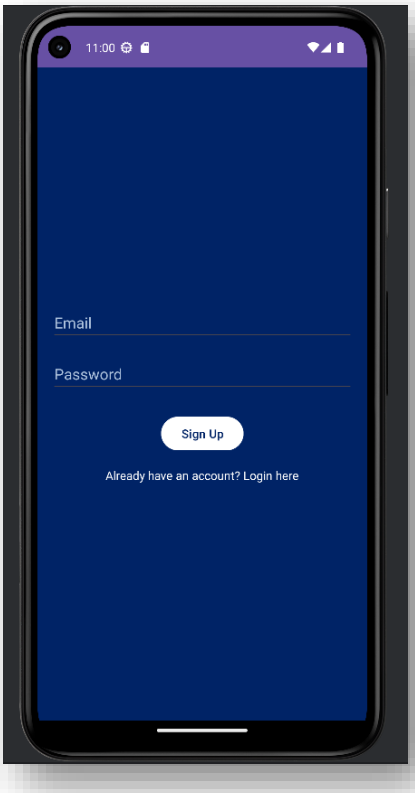
- **SignupActivity.java**

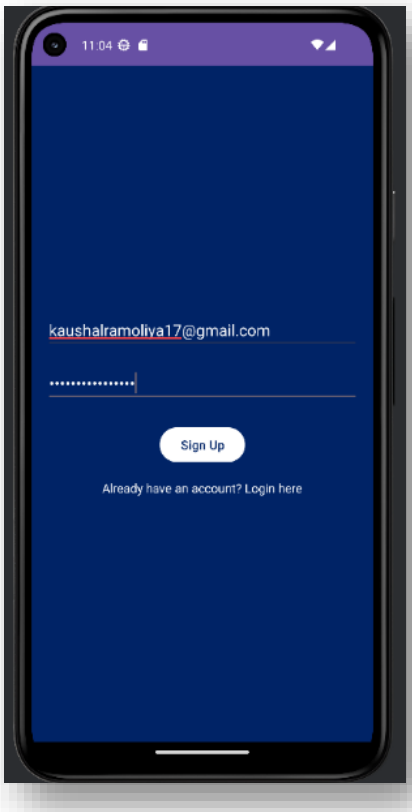
```
package com.example.lab_9;

import android.content.Intent;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import com.google.firebase.auth.FirebaseAuth;
import com.google.firebase.firestore.FirebaseFirestore;
import java.util.HashMap;
import java.util.Map;

public class SignupActivity extends AppCompatActivity {

  private FirebaseAuth auth;
  private FirebaseFirestore db;

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

    auth = FirebaseAuth.getInstance();
    db = FirebaseFirestore.getInstance();

    EditText emailEditText = findViewById(R.id.emailEditText);
    EditText passwordEditText = findViewById(R.id.passwordEditText);
    Button signupButton = findViewById(R.id.signupButton);
    TextView loginRedirectText = findViewById(R.id.loginRedirectText);

    signupButton.setOnClickListener(v -> {
      String email = emailEditText.getText().toString().trim();
      String password = passwordEditText.getText().toString().trim();

      auth.createUserWithEmailAndPassword(email, password)
          .addOnCompleteListener(task -> {
```

```
                    if (task.isSuccessful()) {
                        String userId = auth.getCurrentUser().getUid();
                        Map<String, Object> user = new HashMap<>();
                        user.put("email", email);

                        db.collection("users").document(userId).set(user)
                                .addOnSuccessListener(aVoid -> {
                                    Toast.makeText(SignupActivity.this, "Signup
successful!", Toast.LENGTH_SHORT).show();
                                    startActivity(new Intent(SignupActivity.this,
MainActivity.class));
                                    finish();
                                })
                                .addOnFailureListener(e ->
Toast.makeText(SignupActivity.this, "Error saving user: " + e.getMessage(),
Toast.LENGTH_SHORT).show());
                    } else {
                        Toast.makeText(SignupActivity.this, "Signup failed: " +
task.getException().getMessage(), Toast.LENGTH_LONG).show();
                    }
                });
        });

        loginRedirectText.setOnClickListener(v -> startActivity(new
Intent(SignupActivity.this, MainActivity.class)));
    }
}
```

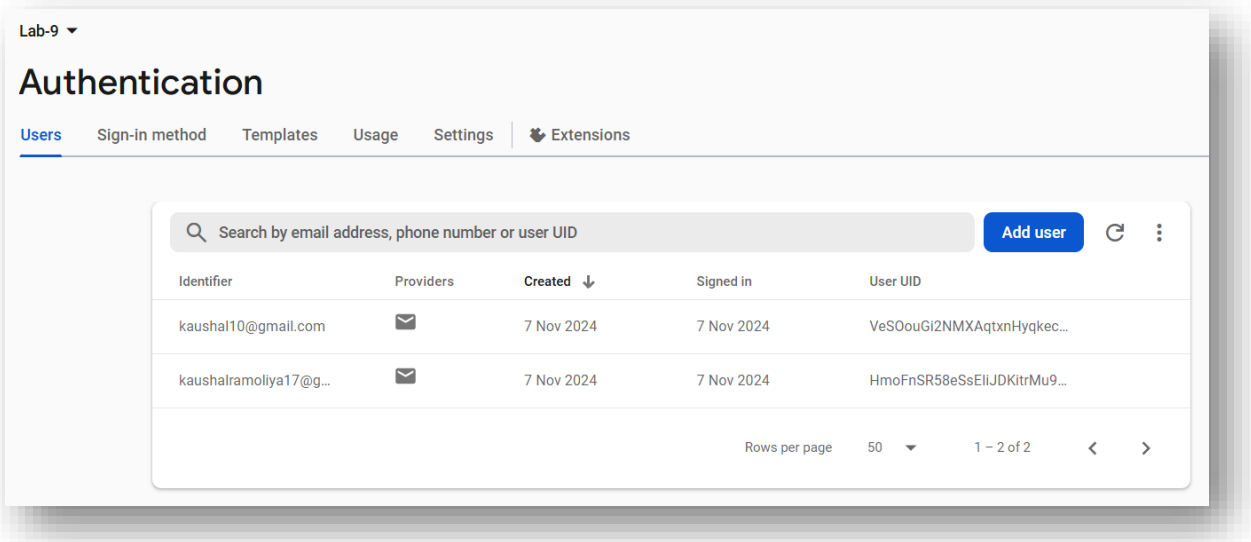
OUTPUT


11:00
Email
Password
Login
Don't have an account? Sign up here


11:00
Email
Password
Sign Up
Already have an account? Login here


11:04
kaushalramoliya17@gmail.com
Sign Up
Already have an account? Login here


11:07
kaushalramoliya17@gamol.com
Login
Don't have an account? Sign up here


Lab-9
Authentication
Users
Sign-in method
Templates
Usage
Settings
Extensions
Search by email address, phone number or user UID
Add user
Identifier
Providers
Created
Signed in
User UID
kaushal10@gmail.com
7 Nov 2024
7 Nov 2024
VeSOouGi2NMXAqtxnHyqkec...
kaushalramoliya17@g...
7 Nov 2024
7 Nov 2024
HmoFnSR58eSsEliJDKitrMu9...
Rows per page
50
1 – 2 of 2