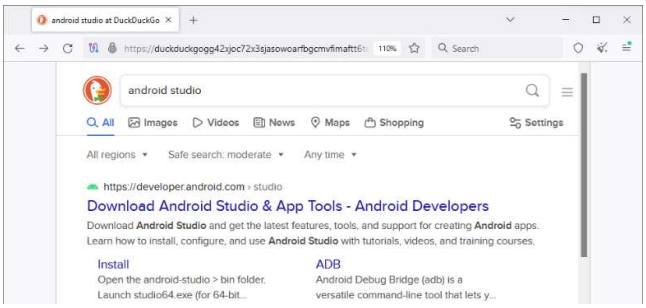
Practical no. 1

Aim: Installation of android studio

Step 1: Head over to this link to get the Android Studio executable or zip file.



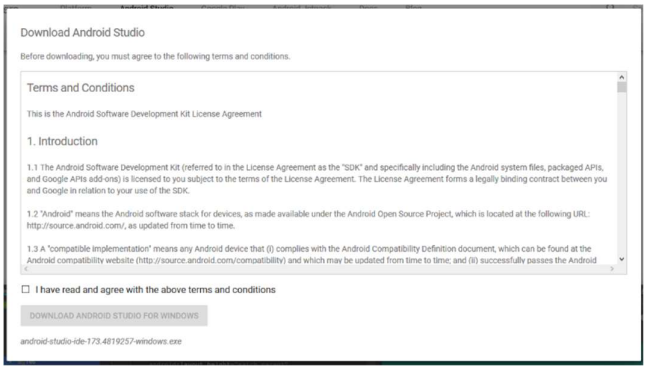
Step 2: Click on the Download Android Studio Button.

Android Studio provides the fastest tools for building apps on every type of Android device.

DOWNLOAD ANDROID STUDIO

4.1.3 for Windows 64-bit (896 MiB)

Click on the “I have read and agree with the above terms and conditions” checkbox followed by the



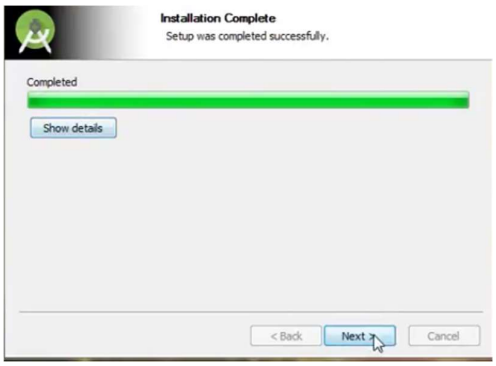
download button.

Click on the Save file button in the appeared prompt box and the file will start downloading.

Step 3: After the downloading has finished, open the file from downloads and run it. It will prompt the following dialog box.

Click on next. In the next prompt, it'll ask for a path for installation. Choose a path and hit next.

Step 4: It will start the installation, and once it is completed, it will be like the image shown below.



Click on next.

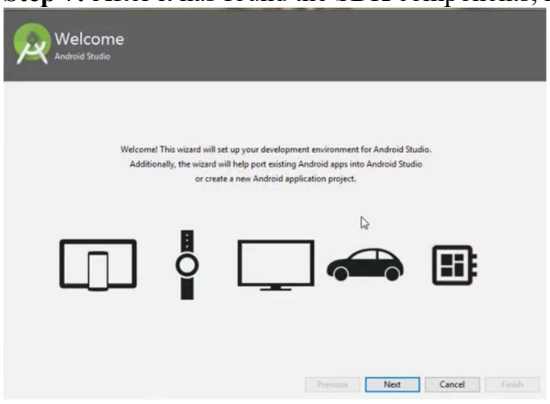
Step 5: Once "Finish" is clicked, it will ask whether the previous settings need to be imported [if the android studio had been installed earlier], or not. It is better to choose the 'Don't import Settings

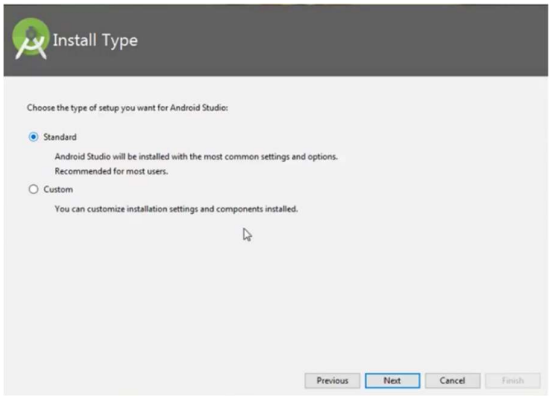
option'.
Click the OK button.

Step 6: This will start the Android Studio.

Meanwhile, it will be finding the available SDK components.

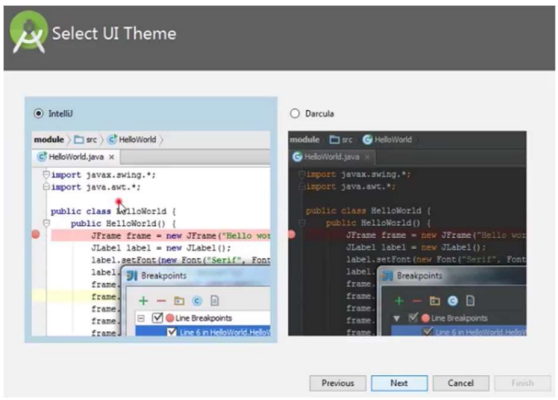
Step 7: After it has found the SDK components, it will redirect to the Welcome dialog box.





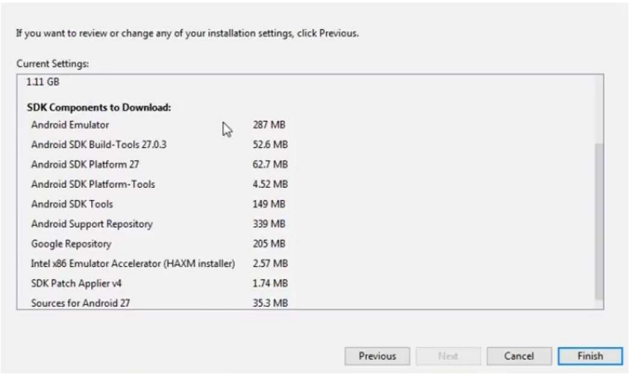
Click on Next.

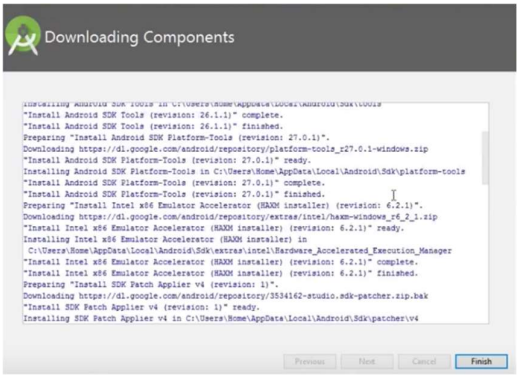
Choose Standard and click on Next. Now choose the theme, whether the Light theme or the Dark one. The light one is called the IntelliJ theme whereas the dark theme is called Dracula. Choose as required.



Click on the Next button.

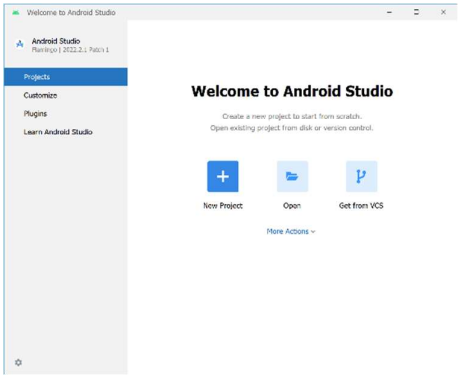
Step 8: Now it is time to download the SDK components.





Click on Finish. Components begin to download let it complete.
The Android Studio has been successfully configured. Now it's time to launch and build apps. Click on the Finish button to launch it.

Step 9: Click on Start a new Android Studio project to build a new app.



Practical no. 2

Aim: Create an Android app which shows a simple text “Hello World”.

Codes:

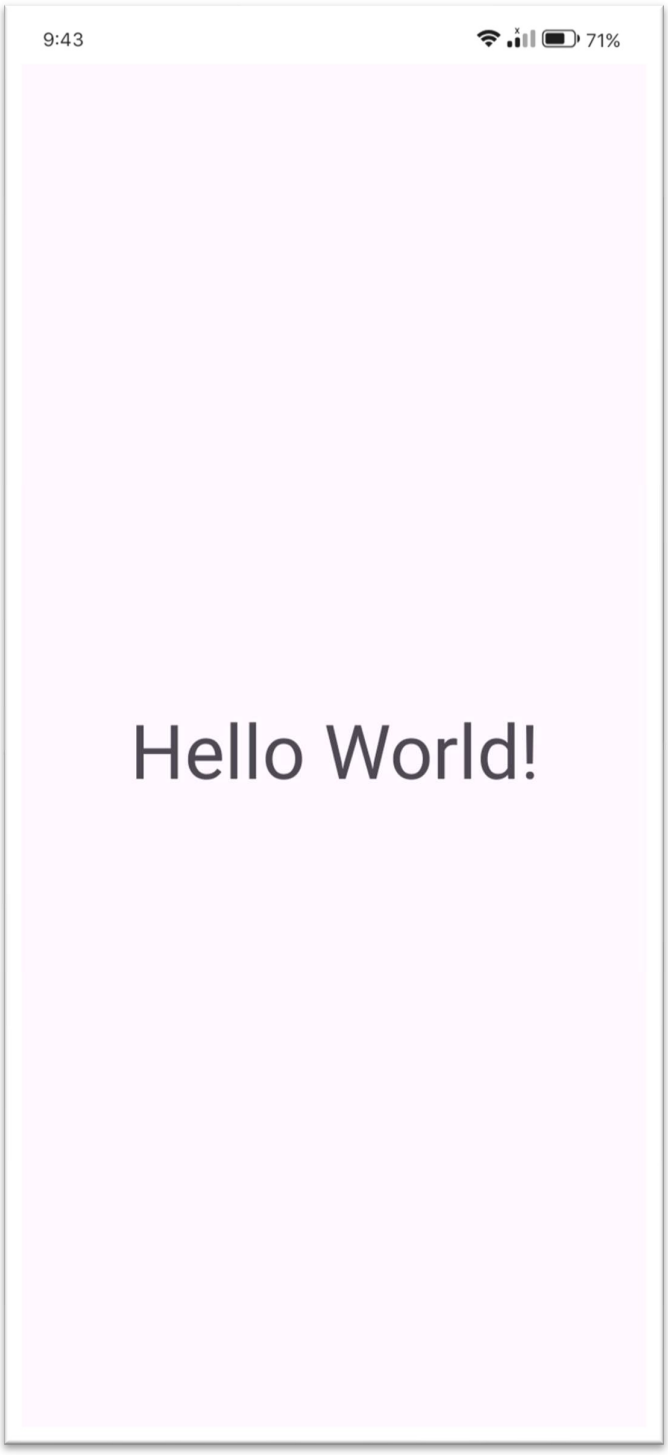
activity_main.xml:

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

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        android:textSize="50dp"
        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 androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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

Output:



Practical no. 3

Aim: Create an Android app with Interactive User Interface using layouts.

Codes:

activity_main.xml:

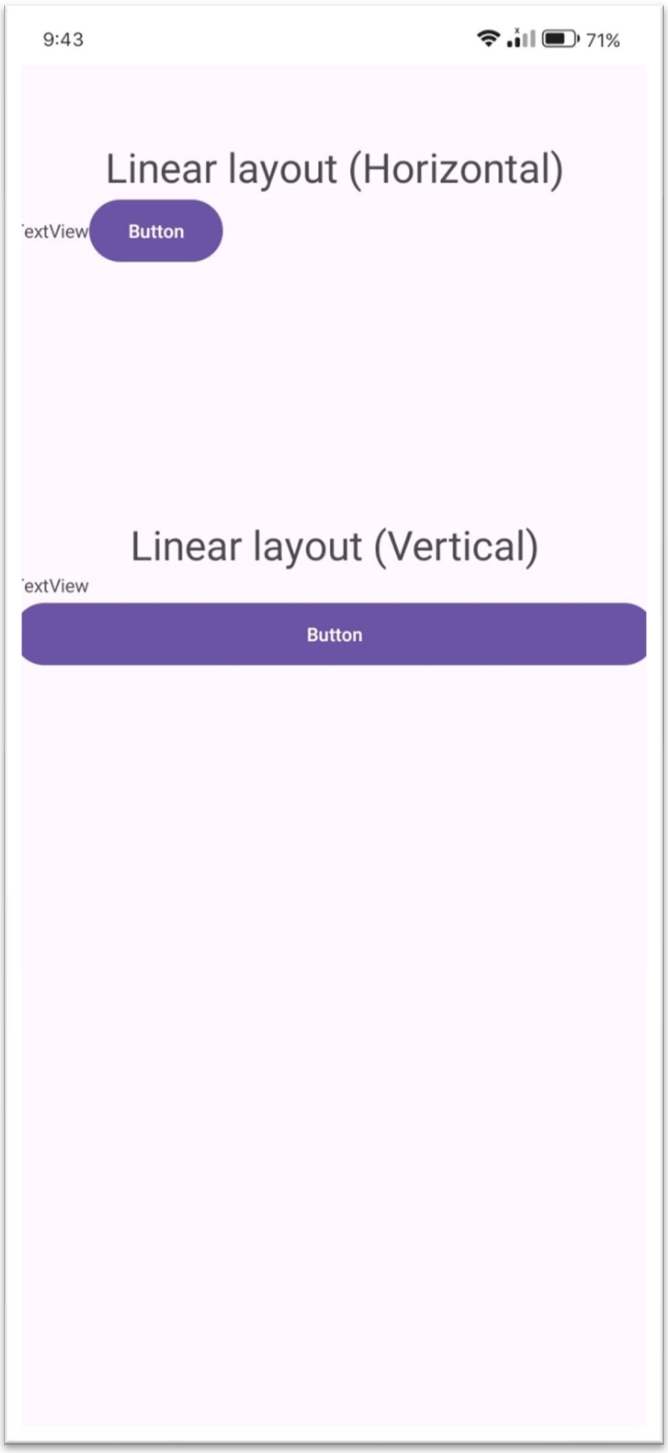
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <TextView
        android:id="@+id/tv1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Linear layout (Horizontal)"
        android:textAlignment="center"
        android:layout_marginTop="50dp"
        android:textSize="30sp" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/tv1"
        android:orientation="horizontal">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="TextView" />

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Button" />
    </LinearLayout>

    <TextView
        android:id="@+id/tv2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="300dp"
        android:text="Linear layout (Vertical)"
```

```
        android:textAlignment="center"
        android:textSize="30sp" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/tv2"
        android:orientation="vertical">

        <TextView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="TextView" />

        <Button
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Button" />
    </LinearLayout>

</RelativeLayout>
```

MainActivity.java:

```
package com.example.prac3;

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

public class MainActivity extends AppCompatActivity {

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

Output:


9:43
71%
Linear layout (Horizontal)
extView
Button
Linear layout (Vertical)
extView
Button

Practical no. 4

Aim: Create an Android app that demonstrates working with TextVeiw elements.

Codes:

activity_main.xml:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="250dp"
        android:text="@string/login_page"
        android:textSize="50sp"
        android:textStyle="bold" />

    <EditText
        android:id="@+id/editText"
        android:layout_width="250dp"
        android:layout_height="50dp"
        android:layout_below="@id/textView"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="30dp"
        android:hint="@string/enter_name"
        android:inputType="text" />

    <EditText
        android:id="@+id/editTextPassword"
        android:layout_width="250dp"
        android:layout_height="50dp"
        android:layout_below="@id/editText"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="10dp"
        android:hint="@string/enter_password"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/button"
```

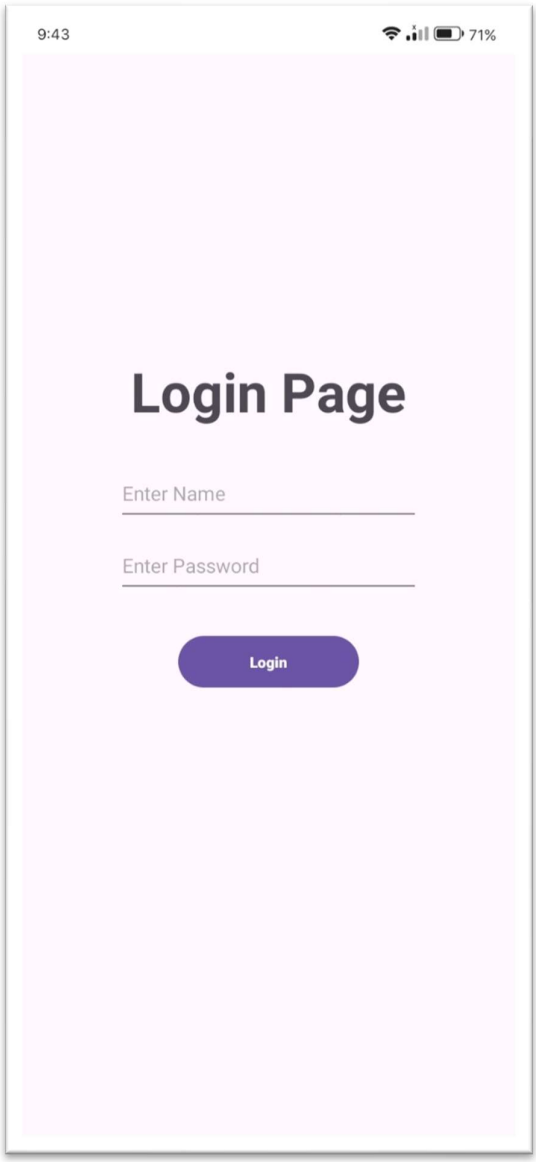
```
        android:layout_width="150dp"
        android:layout_height="50dp"
        android:layout_below="@id/editTextPassword"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="30dp"
        android:text="@string/login"
        android:textStyle="bold" />

</RelativeLayout>
```

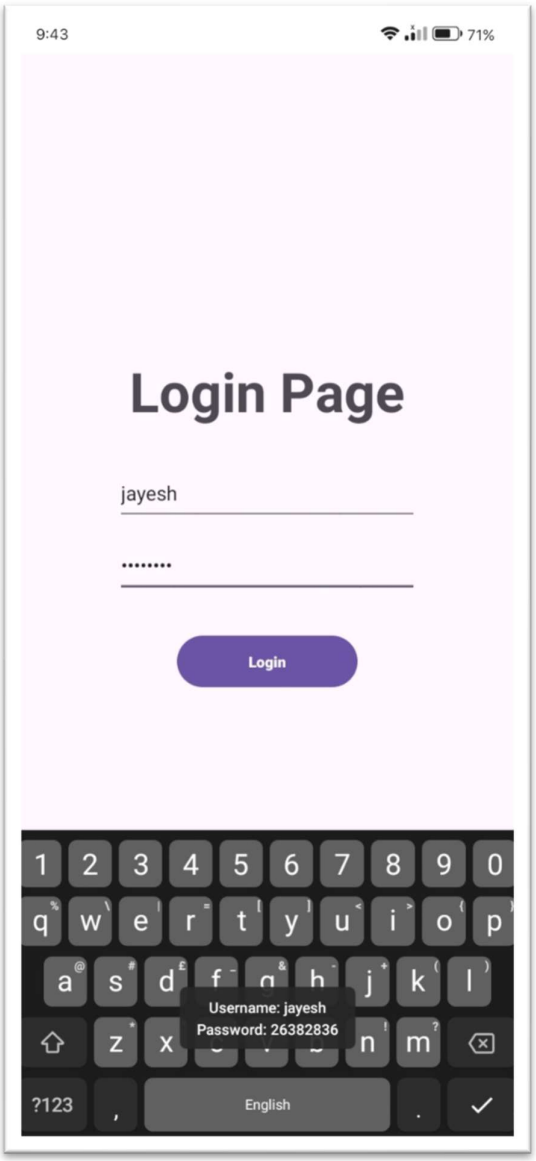
MainActivity.java:

```
package com.example.loginpage;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {

    EditText editText, editTextPassword;

    Button button;

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

        editText = (EditText) findViewById(R.id.editText);
        button = (Button) findViewById(R.id.button);
        editTextPassword = (EditText) findViewById(R.id.editTextPassword);

        button.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String str = "Username:
"+editText.getText().toString()+"\nPassword:
"+editTextPassword.getText().toString();
                Toast msg =
Toast.makeText(getBaseContext(),str,Toast.LENGTH_LONG);
```

```
            msg.show();
        }
    });
  }
}
```

Output:





Practical no. 5

Aim: Create an Android app that demonstrates working with Button elements.

Codes:

activity_main.xml:

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

    <TextView
    android:id="@+id/textView"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Example of checkbox"
    android:textAlignment="center"
    android:textSize="35sp" />

    <CheckBox
        android:id="@+id/checkBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="47dp"
        android:layout_marginTop="142dp"
        android:text="Do you like yourself" />

    <CheckBox
        android:id="@+id/checkBox2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="231dp"
        android:layout_marginTop="145dp"
        android:text="Do you like android" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
```

```
    android:layout_marginStart="62dp"
    android:layout_marginBottom="33dp"
    android:text="Ok" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="76dp"
    android:layout_marginBottom="34dp"
    android:text="Cancel" />

<Switch
    android:id="@+id/switch1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="164dp"
    android:layout_marginTop="222dp"
    android:text="Switch" />

<ToggleButton
    android:id="@+id/toggleButton"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="160dp"
    android:layout_marginTop="252dp"
    android:text="ToggleButton" />

<RadioButton
    android:id="@+id/radioButton"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="48dp"
    android:layout_marginTop="93dp"
    android:text="RadioButton" />

<RadioButton
    android:id="@+id/radioButton2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_marginTop="91dp"
    android:layout_marginEnd="81dp"
```

```
        android:text="RadioButton" />

    <ImageButton
        android:id="@+id/imageButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"
        android:layout_marginBottom="241dp"
        android:src="@drawable/img" />

</RelativeLayout>
```

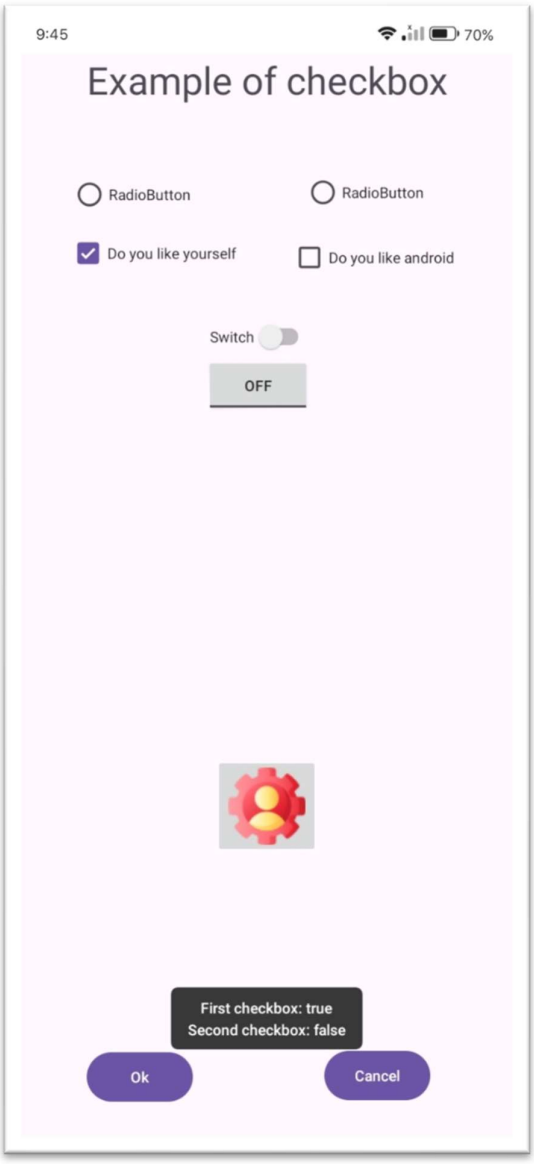
MainActivity.java:

```
package com.example.buttons;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.ImageButton;
import android.widget.RadioButton;
import android.widget.Switch;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    private Button okButton;
    private Button cancelButton;
    private CheckBox checkBox;
    private CheckBox checkBox2;
    private ImageButton imageButton;
    private Switch switch1;
    private RadioButton radioButton;
    private RadioButton radioButton2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        okButton = findViewById(R.id.button);
        cancelButton = findViewById(R.id.button2);
        checkBox = findViewById(R.id.checkBox);
        checkBox2 = findViewById(R.id.checkBox2);
```

```
        imageButton = findViewById(R.id.imageButton);
        switch1 = findViewById(R.id.switch1);
        radioButton = findViewById(R.id.radioButton);
        radioButton2 = findViewById(R.id.radioButton2);
        cancelButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                finish();
            }
        });

        okButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                StringBuffer result = new StringBuffer();
                result.append("First checkbox: ").append(checkBox.isChecked());
                result.append("\nSecond checkbox:
").append(checkBox2.isChecked());
                Toast.makeText(MainActivity.this, result.toString(),
Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

Output:


9:45
70%
Example of checkbox
RadioButton
RadioButton
Do you like yourself
Do you like android
Switch
OFF
Ok
Cancel


9:45
70%
Example of checkbox
RadioButton
RadioButton
Do you like yourself
Do you like android
Switch
OFF
First checkbox: true
Second checkbox: false
Ok
Cancel

Practical no. 6

Aim: Create an Android app that demonstrates Activity Lifecycle and Instance state.

Codes:

activity_main.xml:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:textSize="30sp" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="180dp"
        android:text="View in Logcat"
        android:textSize="40dp" />

</RelativeLayout>
```

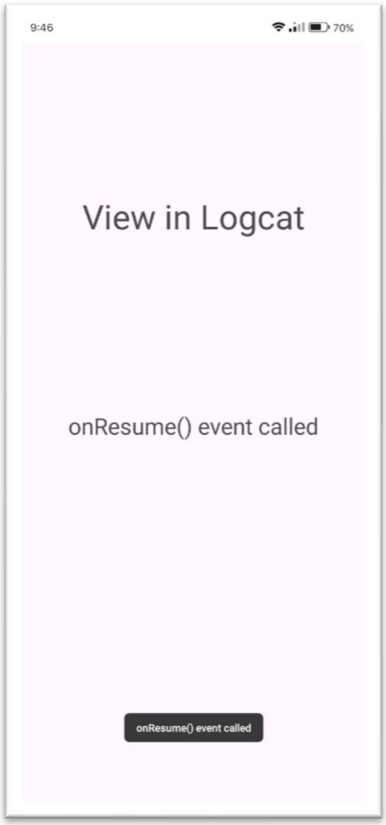
MainActivity.java:

```
package com.example.lifecycle;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.util.Log;
import android.widget.TextView;
import android.widget.Toast;
```

```
public class MainActivity extends AppCompatActivity {
    String msg = "";
    TextView tv;

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

        tv = findViewById(R.id.textView); // Initialize TextView here
        msg = "onCreate() event called";
        Log.d(msg, msg);
        tv.setText(msg);
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStart() {
        super.onStart();
        msg = "onStart() event called";
        Log.d(msg, msg);
        tv.setText(msg);
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onResume() {
        super.onResume();
        msg = "onResume() event called";
        Log.d(msg, msg);
        tv.setText(msg);
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStop() {
        super.onStop();
        msg = "onStop() event called";
        Log.d(msg, msg);
        tv.setText(msg);
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }

    @Override
```

```
    protected void onDestroy() {
        super.onDestroy();
        msg = "onDestroy() event called";
        Log.d(msg, msg);
        tv.setText(msg);
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onPause() {
        super.onPause();
        msg = "onPause() event called";
        Log.d(msg, "The onPause() event");
        tv.setText(msg);
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onRestart() {
        super.onRestart();
        msg = "onRestart() event called";
        tv.setText(msg);
        Log.d(msg, "The onRestart() event");
        Toast.makeText(this, msg, Toast.LENGTH_SHORT).show();
    }
}
```

Output:




```
com.example.lifecycle          D  onCreate() event called
com.example.lifecycle          D  onStart() event called
com.example.lifecycle          D  onResume() event called
com.example.lifecycle          D  onPause() event called
com.example.lifecycle          I  Skipped 3 frames!  The
com.example.lifecycle          E  :0: ObtainWindowParams:
com.example.lifecycle          E  :0: ObtainWindowParams:
com.example.lifecycle          D  Add to mViews: com.colo
com.example.lifecycle          D  hardware acceleration =
com.example.lifecycle          D  onStop() event called

com.example.lifecycle          D  onRestart() event called
com.example.lifecycle          D  onStart() event called
com.example.lifecycle          D  onResume() event called

com.example.lifecycle          D  onDestroy() event called
```

Practical no. 7

Aim: Create an Android app that demonstrates the use of Keyboards and input controls.

Codes:

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_margin="50dp">


    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:hint="Enter Name"
        android:inputType="text" />

    <EditText
        android:id="@+id/email"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@+id/name"
        android:hint="Enter email address"
        android:inputType="textEmailAddress" />

    <EditText
        android:id="@+id/phone"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@+id/email"
        android:hint="Enter phone number"
        android:inputType="phone" />

    <EditText
        android:id="@+id/password"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@+id/phone"
        android:hint="Enter Password"
        android:inputType="textPassword" />
```

```
    <Button
        android:id="@+id/button"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@+id/spinner"
        android:layout_centerInParent="true"
        android:layout_marginTop="20dp"
        android:text="@string/submit" />

    <Spinner
        android:id="@+id/spinner"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@+id/password" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/button"
        android:layout_marginTop="30dp"
        android:text=""
        android:textSize="20dp" />


</RelativeLayout>
```

MainActivity.java:

```
package com.example.keyboard;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Patterns;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    EditText emailEditText, phoneEditText, passwordEditText, nameEditText;
    TextView textView;
```

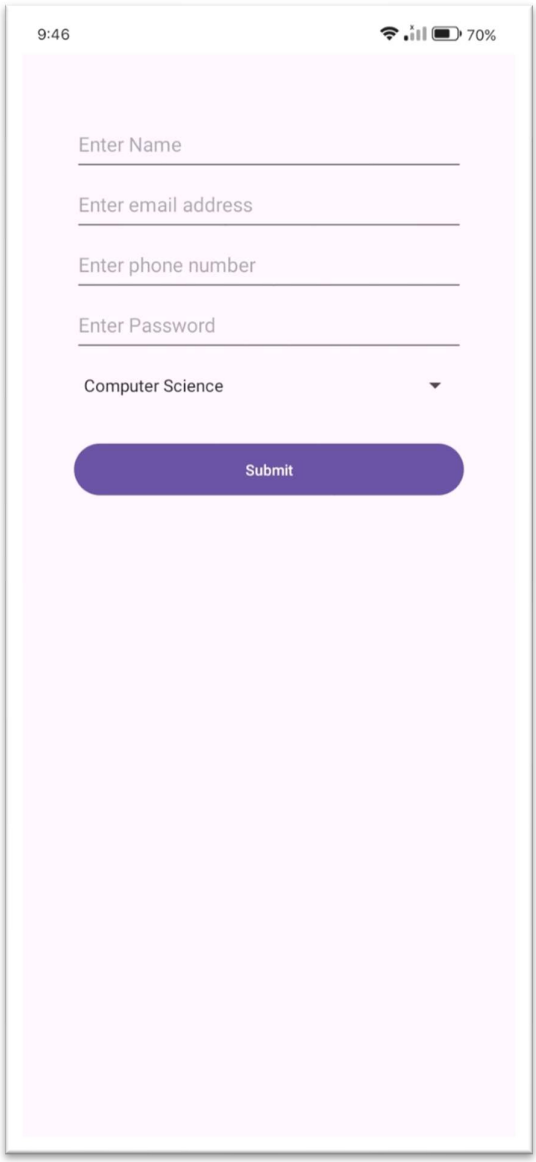
```
    Button btn;
    Spinner spinner;

    String[] cources = {"Computer Science", "Information Technology",
"Zoology", "Bio Technology"};

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

        nameEditText= findViewById(R.id.name);
        emailEditText = findViewById(R.id.email);
        phoneEditText = findViewById(R.id.phone);
        passwordEditText = findViewById(R.id.password);
        btn = findViewById(R.id.button);
        textView = findViewById(R.id.textView);
        spinner = findViewById(R.id.spinner);

        ArrayAdapter<String> adapter = new
ArrayAdapter<String>(MainActivity.this,
android.R.layout.simple_spinner_item,cources);

adapter.setDropDownViewResource(android.R.layout.simple_dropdown_item_1li
ne);
        spinner.setAdapter(adapter);


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

                String name = nameEditText.getText().toString().trim();
                String email = emailEditText.getText().toString().trim();
                String phoneNo = phoneEditText.getText().toString().trim();
                String password = passwordEditText.getText().toString().trim();
                String course = spinner.getSelectedItem().toString().trim();

                if(name.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Please enter your name",
Toast.LENGTH_LONG).show();
                }else if(email.isEmpty() ||
!Patterns.EMAIL_ADDRESS.matcher(email).matches()){
                    Toast.makeText(MainActivity.this,
getString(R.string.validEmail),Toast.LENGTH_LONG).show();
```

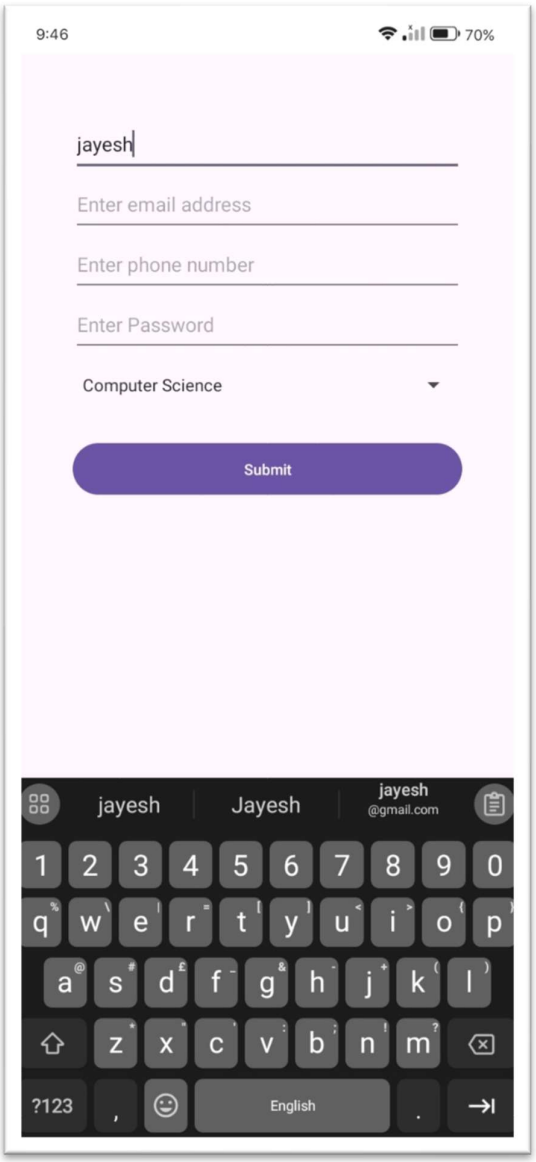
```
            } else if(phoneNo.isEmpty() ||
!Patterns.PHONE.matcher(phoneNo).matches()){
                Toast.makeText(MainActivity.this, getString(R.string.validPhone),
Toast.LENGTH_LONG).show();
            } else if(password.isEmpty() || password.length() < 6) {
                Toast.makeText(MainActivity.this,
getString(R.string.validPassword), Toast.LENGTH_LONG).show();
            } else{
                Toast.makeText(MainActivity.this, "Name: "+name+"\nEmail:
"+email+"\nPhone Number: "+phoneNo+"\nPassword: "+password+"\nCourse:
"+course, Toast.LENGTH_LONG).show();
                textView.setText("Name: "+name+"\nEmail: "+email+"\nPhone
Number: "+phoneNo+"\nPassword: "+password+"\nCourse: "+course);
            }
        }
    });
  }
}
```

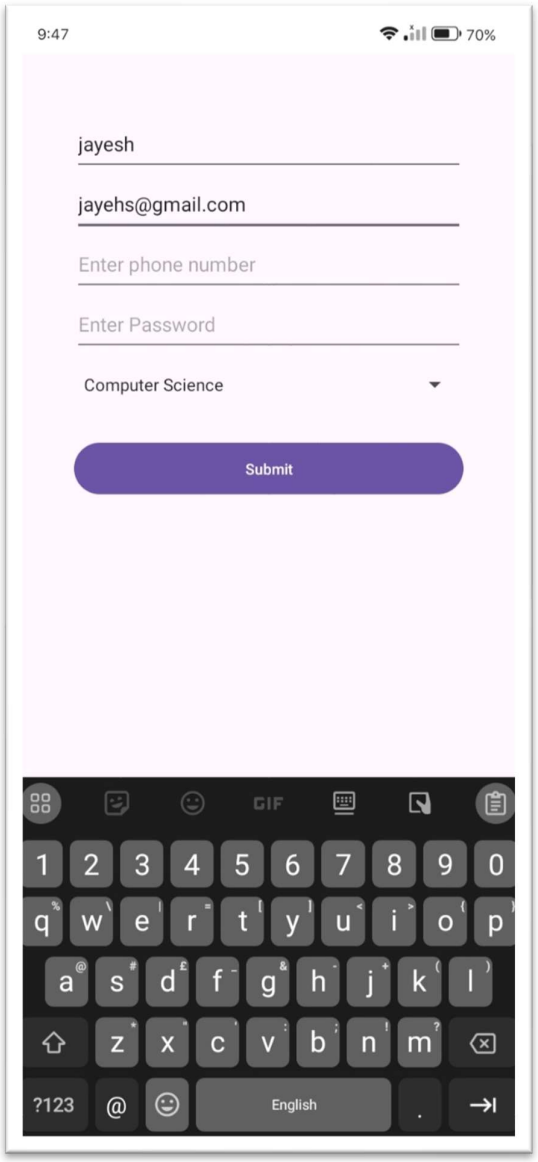
String.xml:

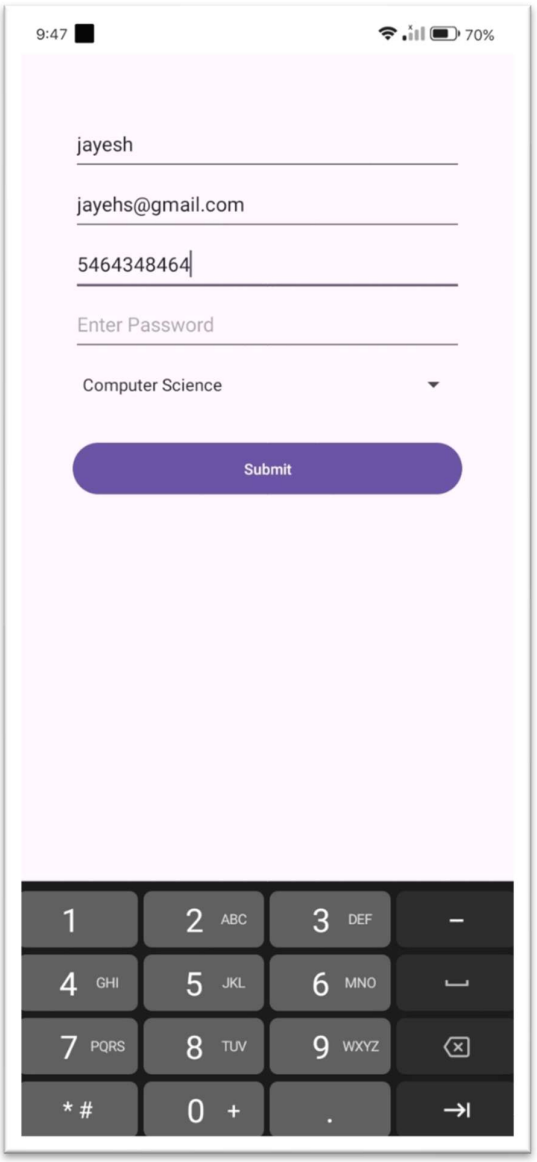
```
<resources>
   <string name="app_name">Practical No 7</string>
   <string name="validEmail">Please enter valid email address</string>
   <string name="validPhone">Enter valid phone number.</string>
   <string name="validPassword">Enter atleast 6 characters.</string>
   <string name="submit">Submit</string>
</resources>
```

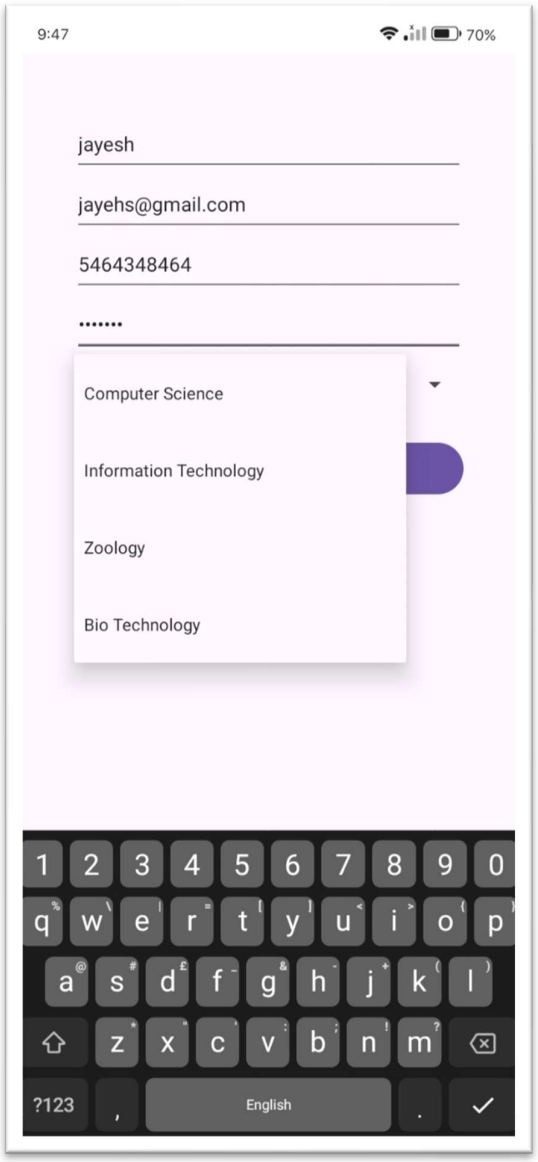
Output:

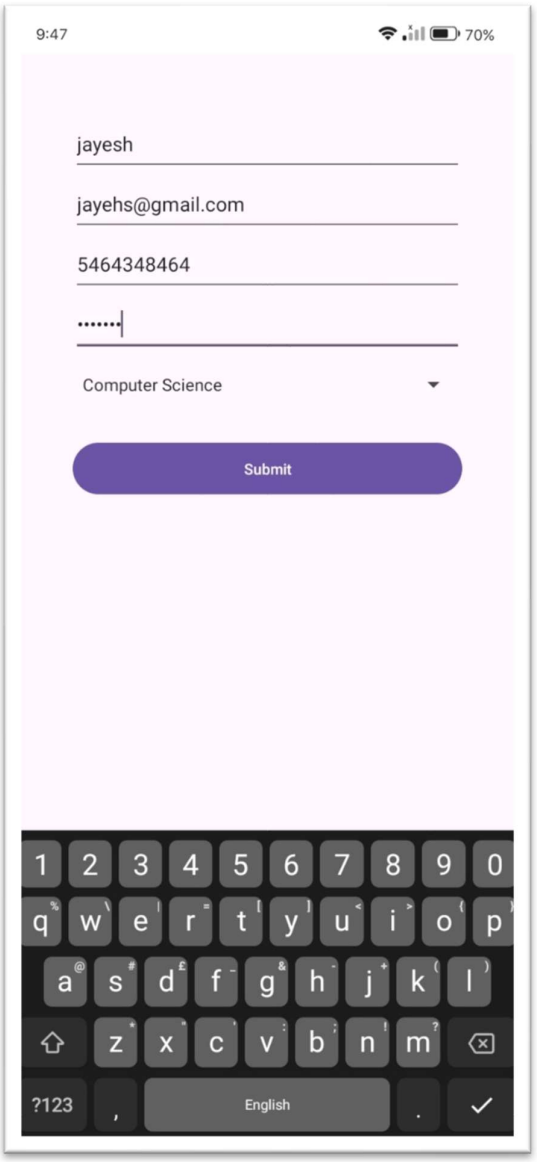

9:46
70%
Enter Name
Enter email address
Enter phone number
Enter Password
Computer Science
Submit

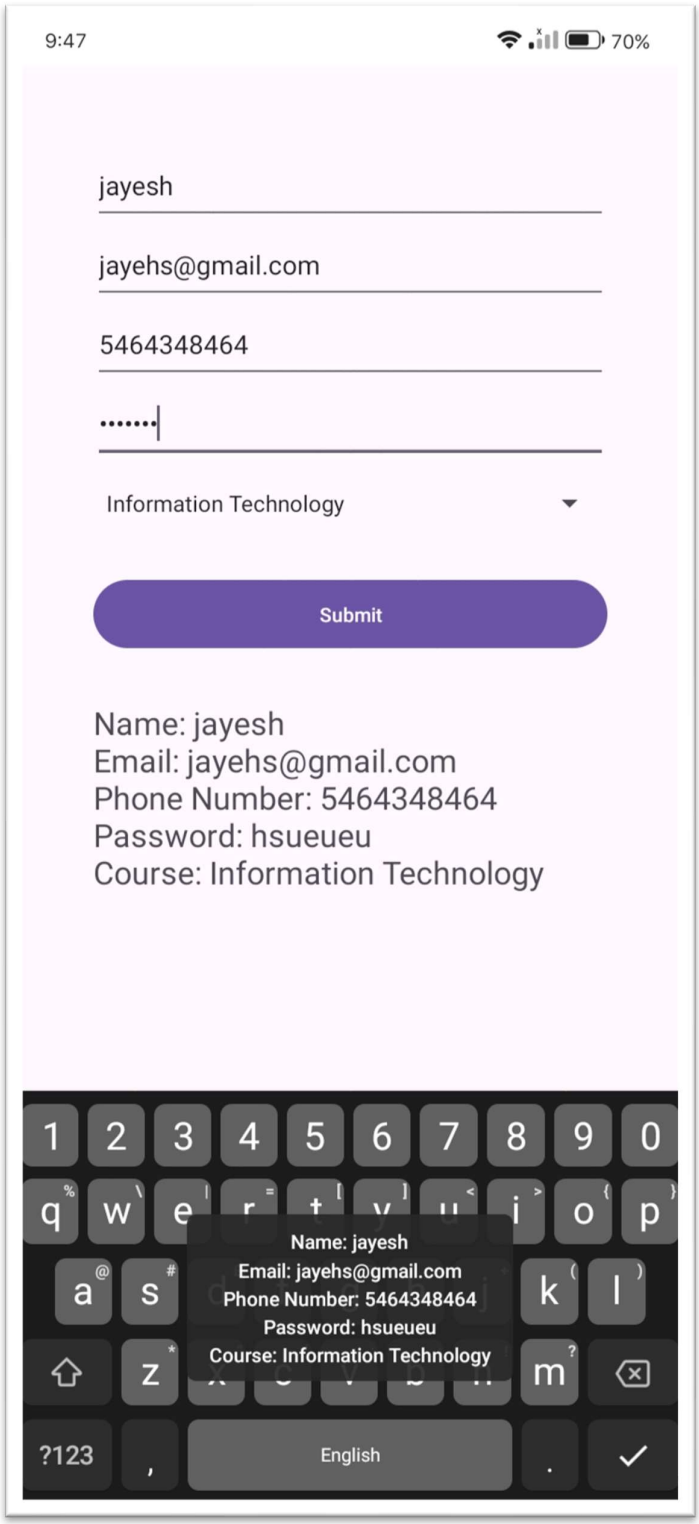

9:46
70%
jayesh
Enter email address
Enter phone number
Enter Password
Computer Science
Submit
jayesh
Jayesh
jayesh
@gmail.com
English


9:47
70%
jayesh
jayehs@gmail.com
Enter phone number
Enter Password
Computer Science
Submit
GIF
1 2 3 4 5 6 7 8 9 0
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
?123
@
English
.


9:47
70%
jayesh
jayehs@gmail.com
5464348464
Enter Password
Computer Science
Submit
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
* #
0 +
.


9:47
70%
jayesh
jayehs@gmail.com
5464348464
Computer Science
Information Technology
Zoology
Bio Technology
?123
English


9:47
70%
jayesh
jayehs@gmail.com
5464348464
Computer Science
Submit
?123
English


9:47
70%
jayesh
jayehs@gmail.com
5464348464
Information Technology
Submit
Name: jayesh
Email: jayehs@gmail.com
Phone Number: 5464348464
Password: hsueueu
Course: Information Technology
Name: jayesh
Email: jayehs@gmail.com
Phone Number: 5464348464
Password: hsueueu
Course: Information Technology
?123
English

Practical no. 8(A)

Aim: Create an Android app that demonstrates the use of Alerts.

Codes:

activity_main.xml:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="201dp"
        android:layout_marginEnd="81dp"
        android:text="@string/tap"
        android:textSize="30dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="209dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"
        android:layout_marginEnd="103dp"
        android:layout_marginBottom="383dp"
        android:onClick="onClickShowAlert"
        android:textSize="20dp"
        android:text="@string/alert" />

</RelativeLayout>
```

MainActivity.java:

```
package com.example.alert;

import androidx.appcompat.app.AlertDialog;
```

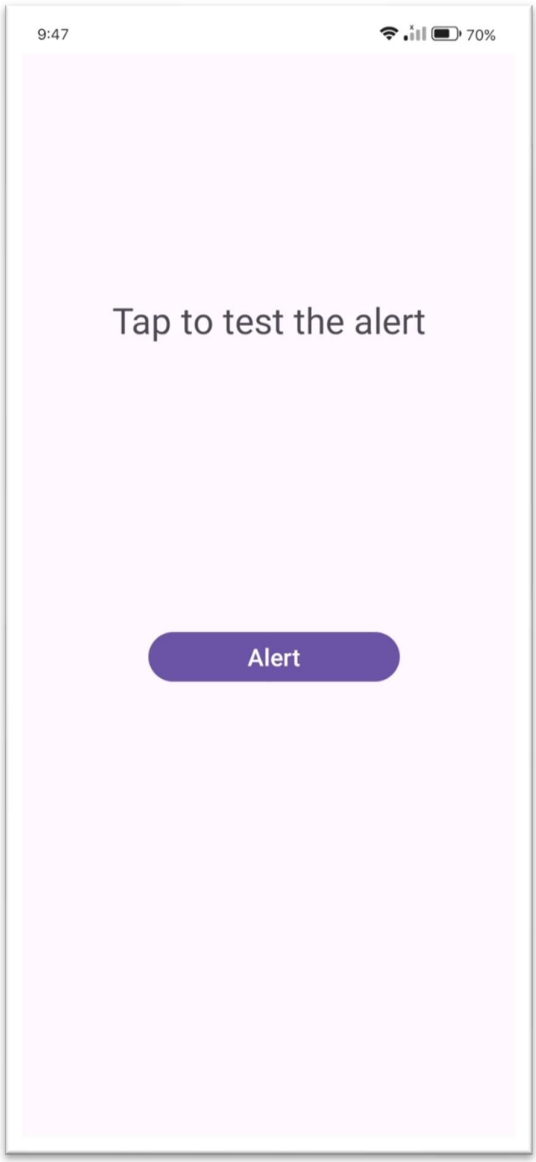
```
import androidx.appcompat.app.AppCompatActivity;

import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

    public void onClickShowAlert(View view){
        AlertDialog.Builder alertBuilder = new
AlertDialog.Builder(MainActivity.this);
        alertBuilder.setTitle(R.string.alertTitle);
        alertBuilder.setMessage(R.string.alertMsg);
        alertBuilder.setPositiveButton(R.string.ok, new
DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialog, int which) {
                Toast.makeText(getApplicationContext(), R.string.okPressed,
Toast.LENGTH_LONG).show();
            }
        });
        alertBuilder.setNegativeButton(R.string.cancel, new
DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialog, int which) {
                Toast.makeText(getApplicationContext(), R.string.cancelPressed,
Toast.LENGTH_LONG).show();
            }
        });
        alertBuilder.show();
    }
}
```

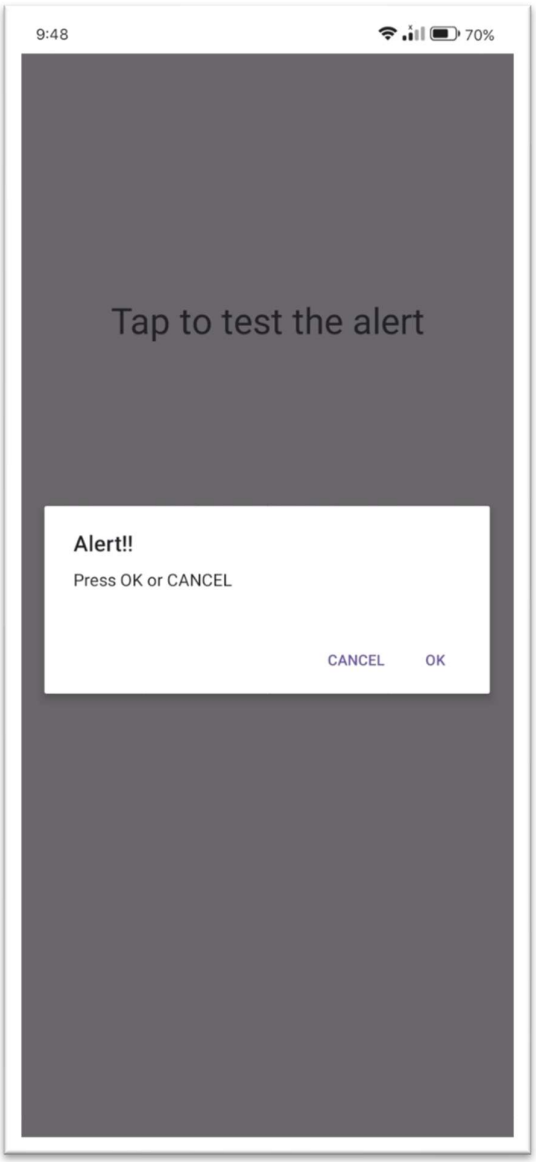
String.xml:

```
<resources>
    <string name="app_name">Alert</string>
    <string name="alert">Alert</string>
    <string name="tap">Tap to test the alert</string>
```

```
    <string name="alertTitle">Alert!!</string>
    <string name="alertMsg">Press OK or CANCEL</string>
    <string name="ok">OK\n</string>
    <string name="okPressed">OK button pressed!!</string>
    <string name="cancel">CANCEL</string>
    <string name="cancelPressed">Cancel button pressed</string>
</resources>
```

Output:


9:47
70%
Tap to test the alert
Alert


9:48
70%
Tap to test the alert
Alert!!
Press OK or CANCEL
CANCEL
OK

Practical no. 8(B)

Aim: Create an Android app that demonstrates the use of Time-picker.

Codes:

activity_main.xml:

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


    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="53dp"
        android:text="@string/pick_the_time_and_press_save_button"
        android:textSize="20sp" />

    <Button
        android:id="@+id/button"
        android:layout_width="258dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"
        android:layout_marginEnd="75dp"
        android:layout_marginBottom="205dp"
        android:onClick="setTime"
        android:text="@string/save"
        tools:layout_editor_absoluteX="38dp"
        tools:layout_editor_absoluteY="242dp" />

    <TimePicker
        android:id="@+id/timePicker1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
```

```
        android:layout_marginTop="139dp" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="96dp"
        android:layout_marginBottom="78dp"
        android:text="@string/the_time_is"
        android:textSize="20sp"
        tools:layout_editor_absoluteX="66dp"
        tools:layout_editor_absoluteY="404dp" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="144dp"
        android:layout_marginBottom="78dp"
        android:text="@string/time_selected"
        android:textSize="20sp"
        tools:layout_editor_absoluteX="77dp"
        tools:layout_editor_absoluteY="483dp" />

</RelativeLayout>
```

MainActivity.java:

```
package com.example.timepicker;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import android.widget.TimePicker;

import java.util.Calendar;

public class MainActivity extends AppCompatActivity {
    private TimePicker timePicker;
```

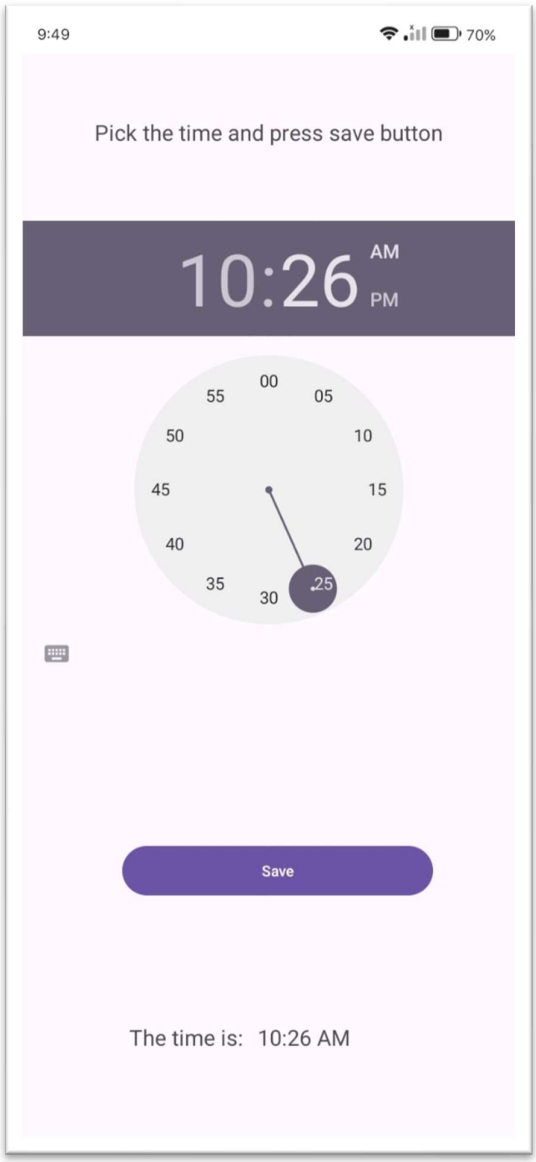
```
    private TextView timeDisplay;
    private Calendar calendar;
    private String format = "";

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

        timePicker = findViewById(R.id.timePicker1);
        timeDisplay = findViewById(R.id.textView);
        calendar = Calendar.getInstance();

        int hour = calendar.get(Calendar.HOUR_OF_DAY);
        int minute = calendar.get(Calendar.MINUTE);
        showTime(hour, minute);
    }

    public void setTime(View view){
        int hour = timePicker.getCurrentHour();
        int minute = timePicker.getCurrentMinute();
        showTime(hour, minute);
    }

    public void showTime(int hour, int minute){
        if(hour ==  0){
            hour += 12;
            format = "AM";
        } else if(hour == 12){
            format = "PM";
        } else if(hour > 12){
            hour -= 12;
            format = "PM";
        } else {
            format = "AM";
        }

        timeDisplay.setText(hour + ":" + minute + " " + format);
    }
}
```

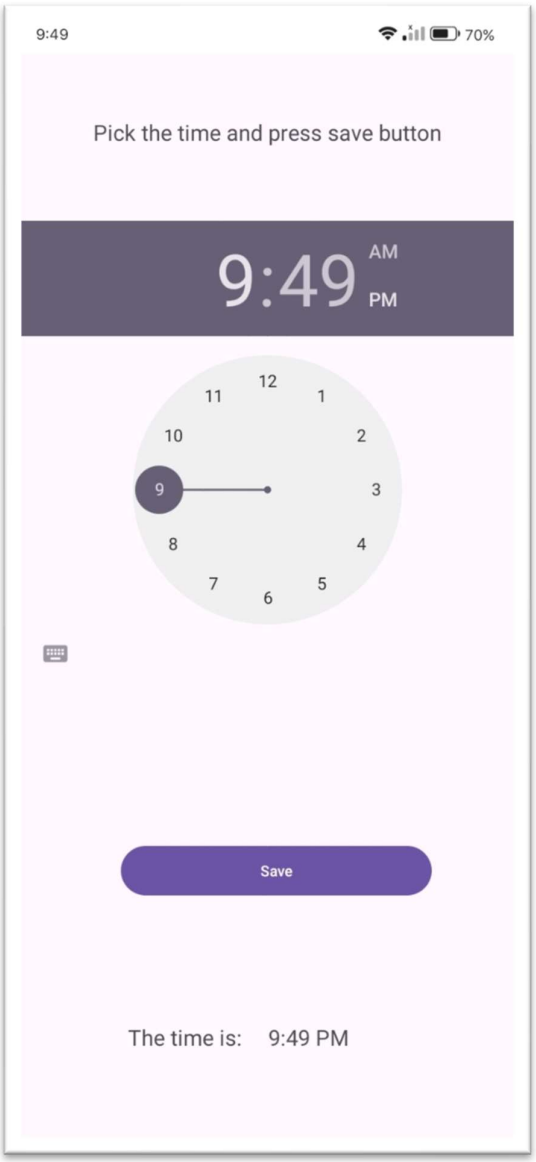
Strings.xml:

```
<resources>
    <string name="app_name">Time Picker </string>
```

```
    <string name="time_picker_example">Time Picker Example</string>
    <string name="pick_the_time_and_press_save_button">Pick the time and
press save button</string>
    <string name="save">Save</string>
    <string name="time_selected">00:00</string>
    <string name="the_time_is">The time is:</string>
</resources>
```

Output:


9:49
70%
Pick the time and press save button
10:26
AM
PM
00
05
10
15
20
25
30
35
40
45
50
55
Save
The time is: 10:26 AM


9:49
70%
Pick the time and press save button
9:49
AM
PM
12
1
2
3
4
5
6
7
8
9
10
11
Save
The time is: 9:49 PM

Practical no. 9

Aim: Create an Android app that demonstrates the use of an Option Menu.

Codes:

activity_main.xml:

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

<com.google.android.material.appbar.AppBarLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
    <androidx.appcompat.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"

android:background="?attr/colorPrimary"></androidx.appcompat.widget.Toolba
r>
</com.google.android.material.appbar.AppBarLayout>

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:text="Selected Option: None"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:textSize="30sp"
        app:layout_constraintStart_toStartOf="parent"
        tools:ignore="NotSibling"
        app:layout_constraintTop_toTopOf="parent" />


</RelativeLayout>
```

MainActivity.java:

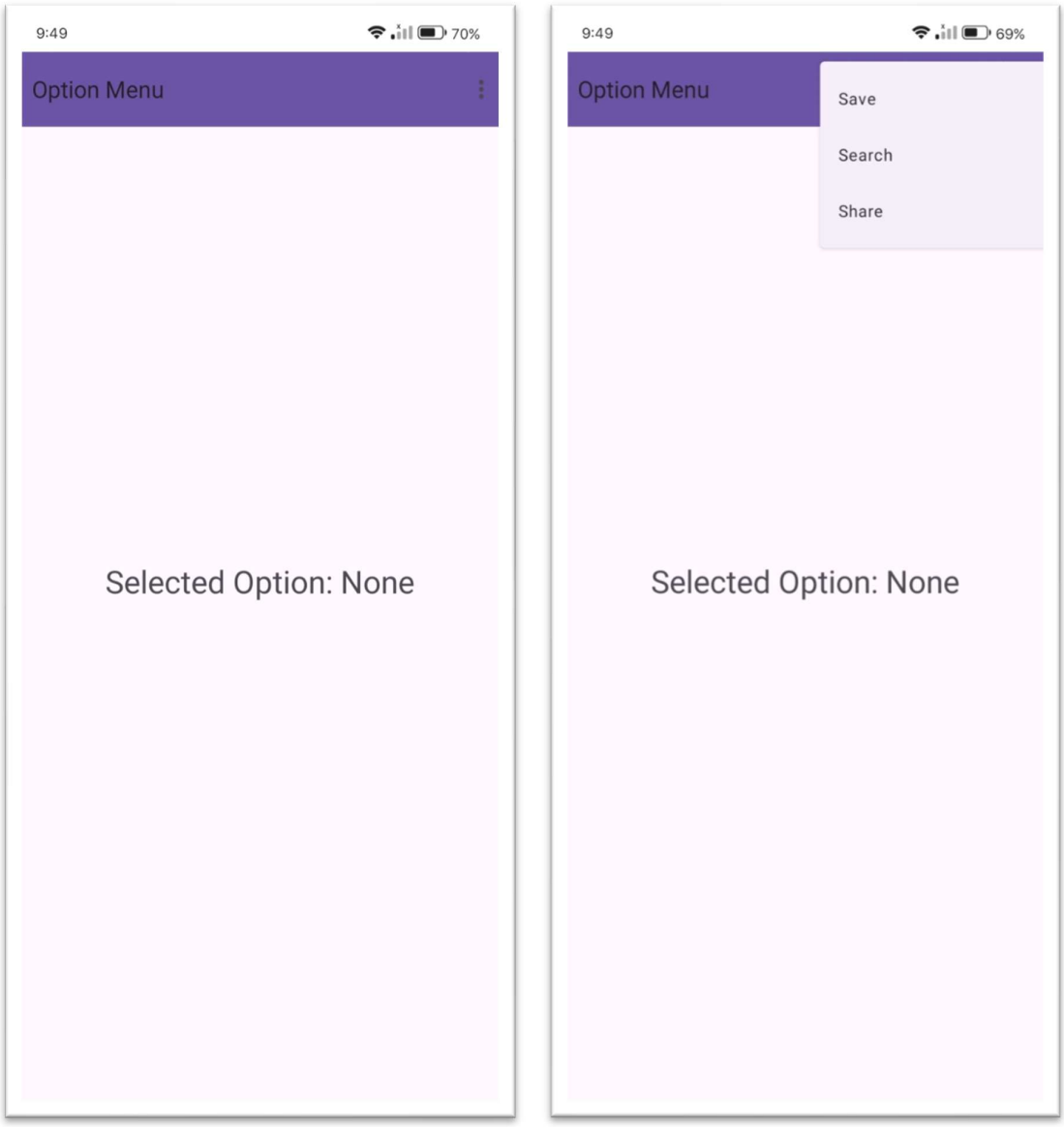
```
package com.example.optionmenu;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;

import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    private TextView textView;
    private Toolbar toolbar;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        toolbar = findViewById(R.id.toolbar);
        textView = findViewById(R.id.textView);

        setSupportActionBar(toolbar);

    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.menu_file, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        if(item.getItemId() == R.id.menu1){
            textView.setText("Selected Option: "+item.getTitle());
            return true;
        } else if(item.getItemId() == R.id.menu2){
            textView.setText("Selected Option: "+item.getTitle());
            return true;
        } else{
            textView.setText("Selected Option: "+item.getTitle());
            return true;
        }
```

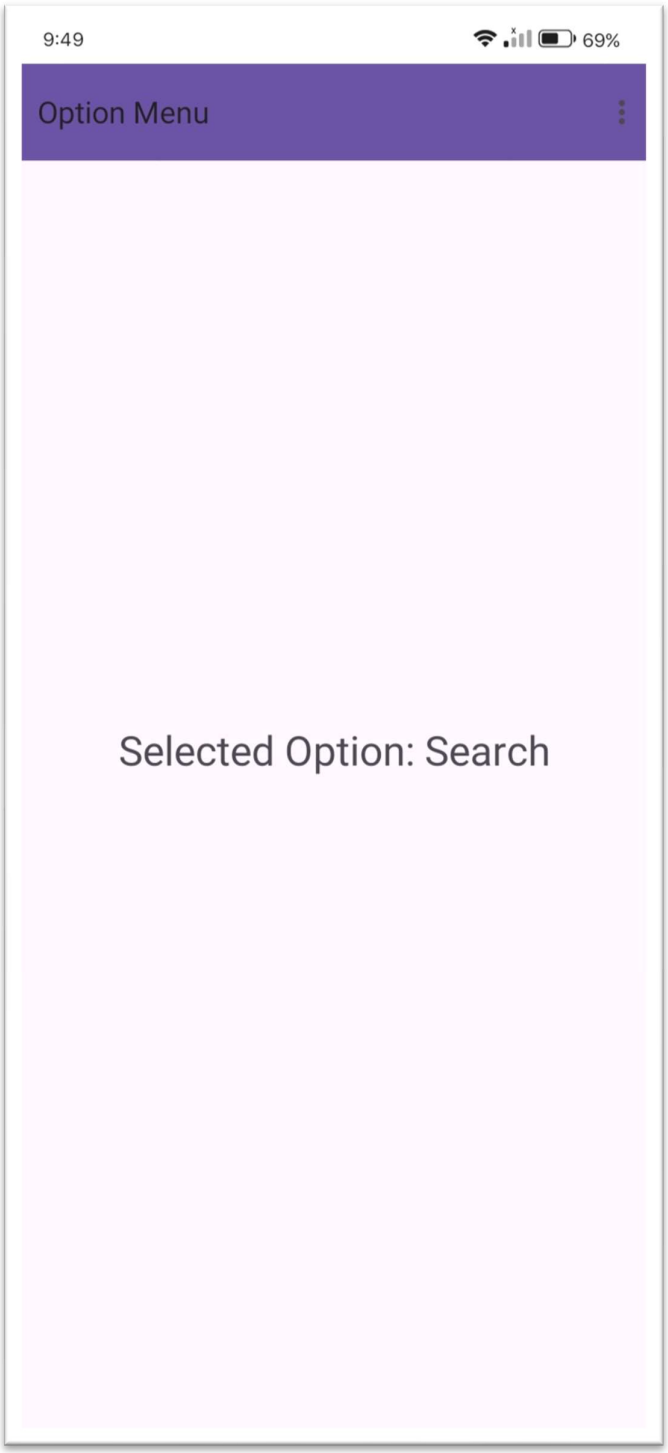
```
   }
}
```

menu_file.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item android:id="@+id/menu1" android:title="Save"/>
    <item android:id="@+id/menu2" android:title="Search"/>
    <item android:id="@+id/menu3" android:title="Share"/>

</menu>
```

Output:


9:49
70%
Option Menu
Selected Option: None
9:49
69%
Option Menu
Save
Search
Share
Selected Option: None


9:49
69%
Option Menu
Selected Option: Search

Practical no. 10

Aim: Create an Android app that demonstrates use of Screen Navigation using the Appbar and Tabs.

Codes:

activity_main.xml:

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

    <com.google.android.material.tabs.TabLayout
        android:id="@+id/tabLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:tabMode="fixed"
        app:tabGravity="fill"
        android:contentDescription="tabs"/>

    <androidx.viewpager.widget.ViewPager
        android:id="@+id/viewPager"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:contentDescription="View Pager" />

</LinearLayout>
```

MainActivity.java:

```
package com.example.screennavigation;

import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.Fragment;
//import androidx.viewpager.widget.PagerAdapter;
import androidx.viewpager.widget.ViewPager;

import android.os.Bundle;

import com.google.android.material.tabs.TabLayout;

import java.util.ArrayList;
```

```
import java.util.List;

public class MainActivity extends AppCompatActivity {

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

        ViewPager viewPager = findViewById(R.id.viewPager);
        TabLayout tabLayout = findViewById(R.id.tabLayout);

        List<Fragment> fragmentList = new ArrayList<>();
        fragmentList.add(new FragmentOne());
        fragmentList.add(new FragmentTwo());

        List<String> fragmentTitles = new ArrayList<>();
        fragmentTitles.add("Tab One");
        fragmentTitles.add("Tab Two");

        PagerAdapter pagerAdapter = new
PagerAdapter(getSupportFragmentManager(), fragmentList, fragmentTitles);
        viewPager.setAdapter(pagerAdapter);
        tabLayout.setupWithViewPager(viewPager);
    }
}
```

PagerAdapter.java:

```
package com.example.screennavigation;

import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.Fragment;
//import androidx.viewpager.widget.PagerAdapter;
import androidx.viewpager.widget.ViewPager;

import android.os.Bundle;

import com.google.android.material.tabs.TabLayout;

import java.util.ArrayList;
import java.util.List;

public class MainActivity extends AppCompatActivity {

    @Override
```

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

        ViewPager viewPager = findViewById(R.id.viewPager);
        TabLayout tabLayout = findViewById(R.id.tabLayout);

        List<Fragment> fragmentList = new ArrayList<>();
        fragmentList.add(new FragmentOne());
        fragmentList.add(new FragmentTwo());

        List<String> fragmentTitles = new ArrayList<>();
        fragmentTitles.add("Tab One");
        fragmentTitles.add("Tab Two");

        PagerAdapter pagerAdapter = new
PagerAdapter(getSupportFragmentManager(), fragmentList, fragmentTitles);
        viewPager.setAdapter(pagerAdapter);
        tabLayout.setupWithViewPager(viewPager);
    }
}
```

Fragment_one.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:gravity="center"
    android:orientation="vertical">

   <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Fragment One"
        android:textSize="30sp" />

</LinearLayout>
```

Fragment_two.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">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Fragment Two"
        android:textSize="30sp" />

</LinearLayout>
```

Output:


9:50
69%
Tab One
Tab Two
Fragment One


9:50
69%
Tab One
Tab Two
Fragment Two

Practical no. 11

Aim: Create an Android app to connect to the internet and use Broadcast Receiver.

Codes:

activity_main.xml:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Check on log cat"
        android:textSize="30sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

AndroidManifest.xml:

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

    <uses-permission
android:name="android.permission.ACCESS_NETWORK_STATE" />
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
```

```
        android:supportsRtl="true"
        android:theme="@style/Theme.Internet"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

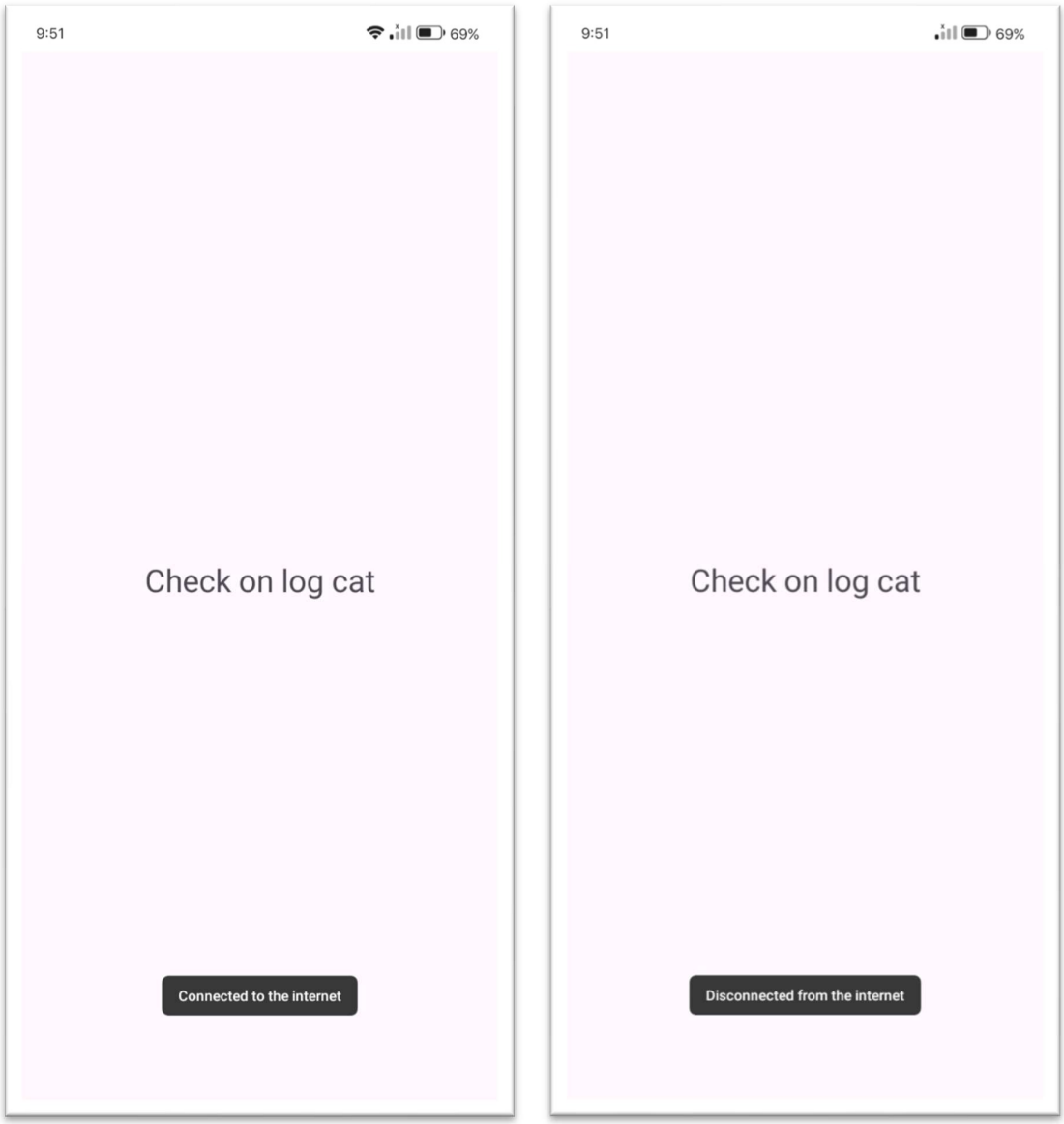
MainActivity.java:

```
package com.example.internet;

import androidx.appcompat.app.AppCompatActivity;
import android.content.IntentFilter;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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

        networkReceiver = new NetworkReceiver();
        registerReceiver(networkReceiver, new
IntentFilter("android.net.conn.CONNECTIVITY_CHANGE"));
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        unregisterReceiver(networkReceiver);
    }
}
```

NetworkReceiver.java

```
package com.example.internet;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.net.ConnectivityManager;
import android.net.NetworkInfo;
import android.util.Log;
import android.widget.TextView;
import android.widget.Toast;

public class NetworkReceiver extends BroadcastReceiver {
   TextView textView;

   @Override
   public void onReceive(Context context, Intent intent) {
      ConnectivityManager connectivityManager = (ConnectivityManager)
context.getSystemService(Context.CONNECTIVITY_SERVICE);

      NetworkInfo networkInfo = connectivityManager.getActiveNetworkInfo();


      if (networkInfo != null && networkInfo.isConnected()) {
         Log.d("NetworkReceiver", "Connected to the internet");
         Toast.makeText(context, "Connected to the internet",
Toast.LENGTH_LONG).show();
      } else {
         Log.d("NetworkReceiver", "Disconnected from the internet");
         Toast.makeText(context, "Disconnected from the internet",
Toast.LENGTH_LONG).show();
      }
   }
}
```

Output:




```
com.example.internet    D  Connected to the internet
com.example.internet    D  Disconnected from the internet
```

Practical no. 12(A)

Aim: Create an Android app that demonstrates the use of Notification.

Codes:

activity_main.xml:

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

    <Button
        android:id="@+id/show_notification_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Get Notification"
        android:onClick="sendNotification"
        android:layout_centerInParent="true"/>

</RelativeLayout>
```

MainActivity.java:

```
package com.example.notification;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.app.NotificationCompat;
import androidx.core.app.NotificationManagerCompat;

import android.Manifest;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity {
```

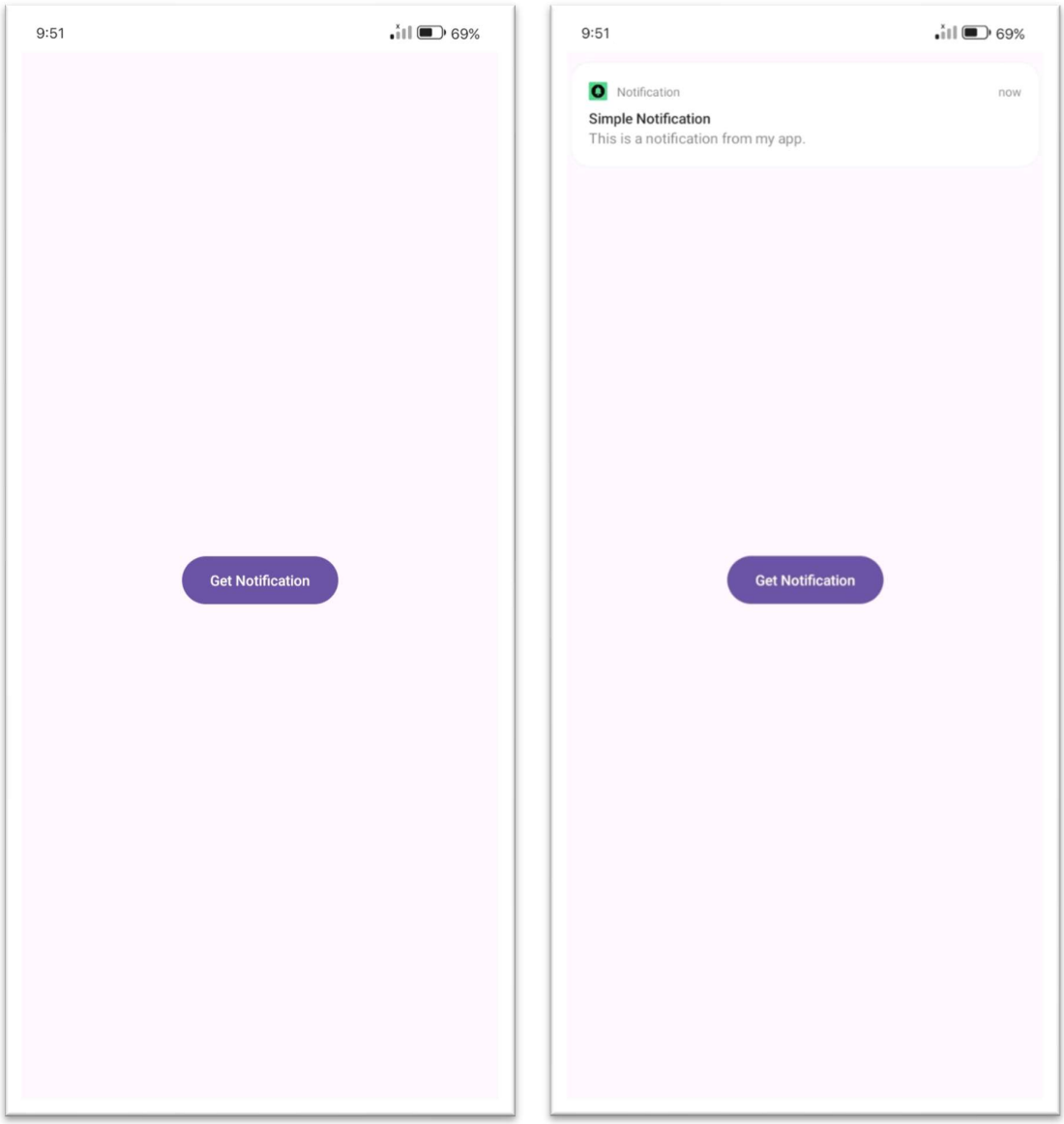
```
    private static final String CHANNEL_ID = "my_channel";

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

        createNotificationChannel();
    }

    private void createNotificationChannel() {
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            CharSequence name = "My Channel";
            String description = "My Channel Description";
            int importance = NotificationManager.IMPORTANCE_DEFAULT;
            NotificationChannel channel = new NotificationChannel(CHANNEL_ID,
name, importance);
            channel.setDescription(description);

            NotificationManager notificationManager =
getSystemService(NotificationManager.class);
            notificationManager.createNotificationChannel(channel);
        }
    }

    public void sendNotification(View view) {
        NotificationCompat.Builder builder = new NotificationCompat.Builder(this,
CHANNEL_ID)
                .setSmallIcon(R.drawable.ic_notification)
                .setContentTitle("Simple Notification")
                .setContentText("This is a notification from my app.")
                .setPriority(NotificationCompat.PRIORITY_HIGH);

        NotificationManagerCompat notificationManager =
NotificationManagerCompat.from(this);
        notificationManager.notify(1, builder.build());

    }

}
```

AndoridManifest.xml:

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

```
    xmlns:tools="http://schemas.android.com/tools">

    <uses-permission android:name="android.permission.POST_NOTIFICATIONS"
/>
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Notification"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

Output:


9:51
69%
Get Notification
9:51
69%
Notification
now
Simple Notification
This is a notification from my app.
Get Notification

Practical no. 12(B)

Aim: Create an Android app that demonstrates the use of Alarm Manager.

Codes:

activity_main.xml:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="159dp"
        android:text="Alarm Status"
        android:textSize="30sp" />

    <Button
        android:id="@+id/alarmButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_centerVertical="true"
        android:textSize="20sp"
        android:text="Set Alarm"

        />

</RelativeLayout>
```

MainActivity.java:

```
package com.example.alarmmanager;

import androidx.appcompat.app.AppCompatActivity;

import android.app.AlarmManager;
import android.app.PendingIntent;
```

```
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.os.Bundle;
import android.os.SystemClock;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {
    private TextView textView;
    private AlarmManager alarmManager;
    private PendingIntent alarmIntent;
    private static final long time=5000;

    private BroadcastReceiver alarmReceiver = new AlarmReceiver(){
        @Override
        public void onReceive(Context context, Intent intent) {
            SimpleDateFormat sdf = new SimpleDateFormat("HH:mm:ss",
Locale.getDefault());
            String currentTime = sdf.format(new Date());
            textView.setText("Alarm Triggerd at: "+currentTime);
        }
    };
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        textView = findViewById(R.id.textView);
        Button alarmButton = findViewById(R.id.alarmButton);

        alarmManager = (AlarmManager)
getSystemService(Context.ALARM_SERVICE);
        Intent alarmReceiverIntent = new Intent(this,AlarmReceiver.class);
        alarmIntent = PendingIntent.getBroadcast(this,0,alarmReceiverIntent,
PendingIntent.FLAG_IMMUTABLE);

        registerReceiver(alarmReceiver, new IntentFilter("ALARM_TRIGGERED"));
```

```
        alarmButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                setAlarm();
            }
        });
    }

    private void setAlarm(){
        long triggerTime = SystemClock.elapsedRealtime() + time;

alarmManager.setExactAndAllowWhileIdle(AlarmManager.ELAPSED_REALTIME_
WAKEUP, triggerTime, alarmIntent);
        textView.setText("Alarm set to trigger after 5 seconds ");
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        unregisterReceiver(alarmReceiver);
    }
}
```

AlarmReceiver.java

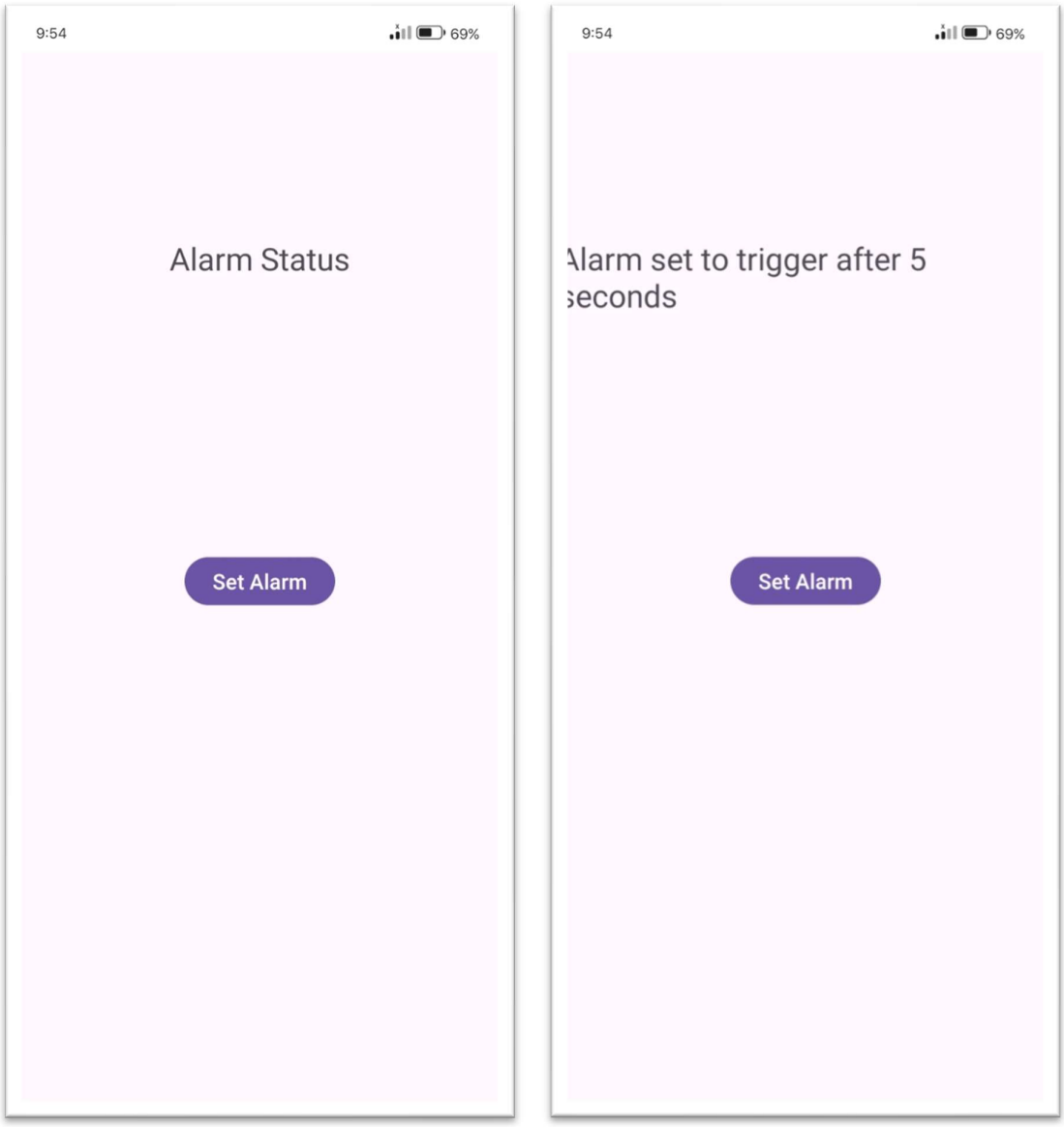
```
package com.example.alarmmanager;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;

public class AlarmReceiver extends BroadcastReceiver {
    @Override
    public void onReceive(Context context, Intent intent) {
        Intent broadcastIntent = new Intent("ALARM_TRIGGERED");
        context.sendBroadcast(broadcastIntent);
    }
}
```

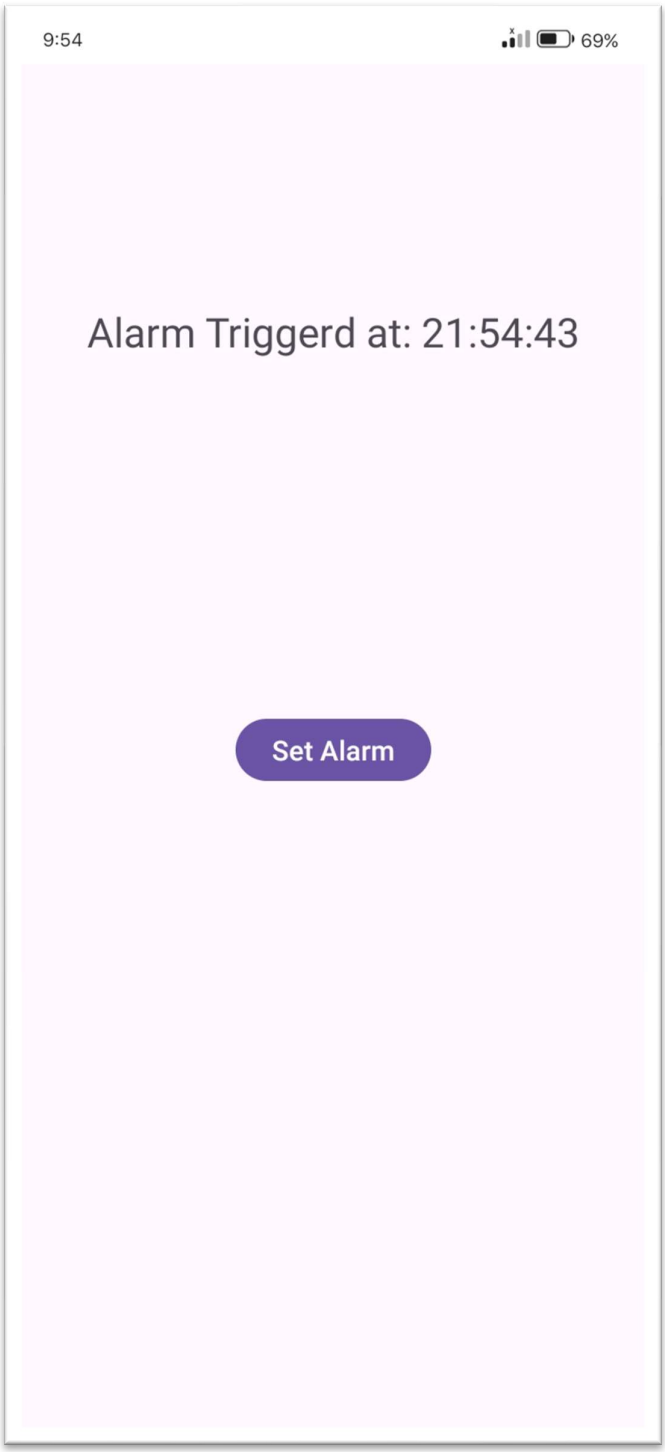
AndrodManifest.xml

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

```
    <uses-permission
android:name="android.permission.RECEIVE_BOOT_COMPLETED"/>
    <uses-permission
android:name="android.permission.SCHEDULE_EXACT_ALARM"/>
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.AlarmManager"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <receiver android:name=".AlarmReceiver"/>
    </application>

</manifest>
```

Output:


9:54
69%
Alarm Status
Set Alarm
9:54
69%
Alarm set to trigger after 5
seconds
Set Alarm


9:54
69%
Alarm Triggerd at: 21:54:43
Set Alarm

Practical no. 13

Aim: Create an Android app to save user's data in a database and use of different queries.

Codes:

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="50sp">

    <EditText
        android:id="@+id/editTextName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:hint="@string/enter_name"
        android:textSize="20sp"
        android:inputType="text"
        android:autofillHints="" />

    <EditText
        android:id="@+id/editTextEmail"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:textSize="20sp"
        android:inputType="textEmailAddress"
        android:hint="@string/enter_email" />


    <Button
        android:id="@+id/btnInsert"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="@string/insert_data"
        android:textSize="18sp" />

    <EditText
```

```
        android:id="@+id/editTextUserId"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="50sp"
        android:textSize="20sp"
        android:inputType="number"
        android:hint="@string/enter_user_id"
        android:autofillHints="" />

    <Button
        android:id="@+id/btnRetrieveById"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="@string/retrieve_user_by_id" />

    <Button
        android:id="@+id/btnRetrieveAll"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="@string/retrieve_all_users" />

    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_marginTop="10dp">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="vertical">
            <TextView
                android:id="@+id/textViewData"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_marginTop="30dp"
                android:text="@string/data_will_be_displayed_here"
                android:textSize="20sp" />
        </LinearLayout>
    </ScrollView>

</LinearLayout>
```

string.xml:

```
<resources>
    <string name="app_name">Database</string>
    <string name="insert_data">Insert Data</string>
    <string name="retrieve_all_users">Retrieve All Users</string>
    <string name="retrieve_user_by_id">Retrieve User by ID</string>
    <string name="enter_email">Enter Email</string>
    <string name="enter_name">Enter Name</string>
    <string name="enter_user_id">Enter User ID</string>
    <string name="data_will_be_displayed_here">Data will be displayed
here.</string>
</resources>
```

AndroidManifest.xml:

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

    <uses-permission
android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
    <uses-permission
android:name="android.permission.READ_EXTERNAL_STORAGE"/>
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Database"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

MainActivity.java:

```
package com.example.database;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.util.Log;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;
import java.util.List;
public class MainActivity extends AppCompatActivity {
    private EditText editTextName, editTextEmail, editTextUserId;
    private TextView textViewData;
    private DatabaseHelper databaseHelper;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        editTextName = findViewById(R.id.editTextName);
        editTextEmail = findViewById(R.id.editTextEmail);
        editTextUserId = findViewById(R.id.editTextUserId);
        Button btnInsert = findViewById(R.id.btnInsert);
        Button btnRetrieveAll = findViewById(R.id.btnRetrieveAll);
        Button btnRetrieveById = findViewById(R.id.btnRetrieveById);
        textViewData = findViewById(R.id.textViewData);
        databaseHelper = new DatabaseHelper(this);
        btnInsert.setOnClickListener(v -> insertUserData());
        btnRetrieveAll.setOnClickListener(v -> retrieveAllUsers());
        btnRetrieveById.setOnClickListener(v -> retrieveUserById());
    }
    private void insertUserData() {
        String name = editTextName.getText().toString().trim();
        String email = editTextEmail.getText().toString().trim();
        long userId = databaseHelper.insertUser(name, email);
        Log.d("UserData", "User inserted with ID: " + userId);

        String str = "Inserted\nUsername:
"+editTextName.getText().toString()+"\nEmail:
"+editTextEmail.getText().toString();
        Toast msg = Toast.makeText(getBaseContext(),str,Toast.LENGTH_LONG);
```

```
        msg.show();

        editTextName.setText("");
        editTextEmail.setText("");
        editTextUserId.setText("");
    }
    private void retrieveAllUsers() {
        List<User> allUsers = databaseHelper.getAllUsers();

        StringBuilder userData = new StringBuilder("All Users:\n");
        for (User user : allUsers) {
            userData.append("ID: ").append(user.getId()).append(", Name:
").append(user.getName()).append(", Email:
").append(user.getEmail()).append(".\n");
        }
        textViewData.setText(userData.toString());
        editTextName.setText("");
        editTextEmail.setText("");
        editTextUserId.setText("");
    }
    @SuppressLint("SetTextI18n")
    private void retrieveUserById() {
        String userIdString = editTextUserId.getText().toString().trim();
        if (!userIdString.isEmpty()) {
            long userId = Long.parseLong(userIdString);
            User user = databaseHelper.getUserById(userId);
            if (user != null) {
                textViewData.setText("User found by ID:\n" + "ID: " +
                        user.getId() + "\nName: " + user.getName() + "\nEmail: " +
                        user.getEmail());
            } else {
                textViewData.setText("User not found by ID: " + userId);
            }
        } else {
            textViewData.setText("Please enter a user ID.");
        }
        editTextName.setText("");
        editTextEmail.setText("");
        editTextUserId.setText("");
    }
}
```

DatabaseHelper.java:

```
package com.example.database;

import android.annotation.SuppressLint;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import java.util.ArrayList;
import java.util.List;
class DatabaseHelper extends SQLiteOpenHelper {
    private static final String DATABASE_NAME = "user_data.db";
    private static final int DATABASE_VERSION = 1;
    public static final String TABLE_USERS = "users";
    public static final String COLUMN_ID = "id";
    public static final String COLUMN_NAME = "name";
    public static final String COLUMN_EMAIL = "email";
    private static final String TABLE_CREATE = "CREATE TABLE " + TABLE_USERS
+ " (" + COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
COLUMN_NAME + " TEXT, " + COLUMN_EMAIL + "    TEXT);";

    public DatabaseHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }
    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL(TABLE_CREATE);
    }
    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int
            newVersion) {
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_USERS);
        onCreate(db);
    }
    public long insertUser(String name, String email) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(COLUMN_NAME, name);
        values.put(COLUMN_EMAIL, email);
        long userId = db.insert(TABLE_USERS, null, values);
        db.close();
        return userId;
    }
    @SuppressLint("Range")
```

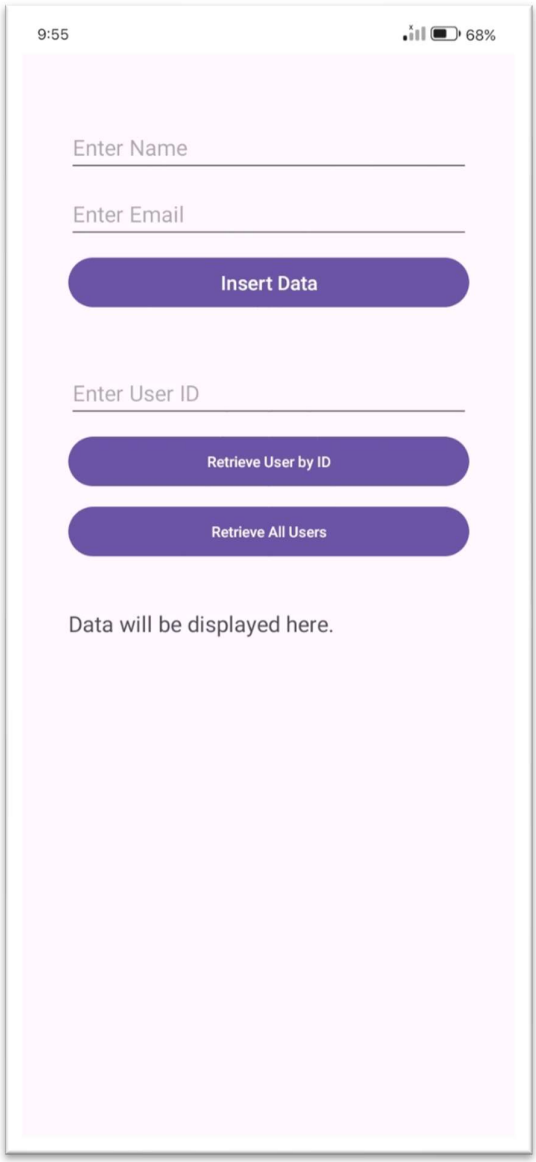
```
    public List<User> getAllUsers() {
        List<User> users = new ArrayList<>();
        String selectQuery = "SELECT * FROM " + TABLE_USERS;
        SQLiteDatabase db = this.getWritableDatabase();
        Cursor cursor = db.rawQuery(selectQuery, null);
        if (cursor != null && cursor.moveToFirst()) {
            do {
                User user = new User();
                user.setId(cursor.getLong(cursor.getColumnIndex(COLUMN_ID)));

user.setName(cursor.getString(cursor.getColumnIndex(COLUMN_NAME)));

user.setEmail(cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)));
                users.add(user);
            } while (cursor.moveToNext());
            cursor.close();
        }
        db.close();
        return users;
    }
    @SuppressLint("Range")
    public User getUserById(long userId) {
        SQLiteDatabase db = this.getReadableDatabase();
        Cursor cursor = db.query(
                TABLE_USERS,
                new String[]{COLUMN_ID, COLUMN_NAME, COLUMN_EMAIL},
                COLUMN_ID + "=?",
                new String[]{String.valueOf(userId)},
                null,
                null,

                null,
                null
        );
        User user = null;
        if (cursor != null && cursor.moveToFirst()) {
            user = new User();
            user.setId(cursor.getLong(cursor.getColumnIndex(COLUMN_ID)));

user.setName(cursor.getString(cursor.getColumnIndex(COLUMN_NAME)));

user.setEmail(cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)));
            cursor.close();
        }
        db.close();
```

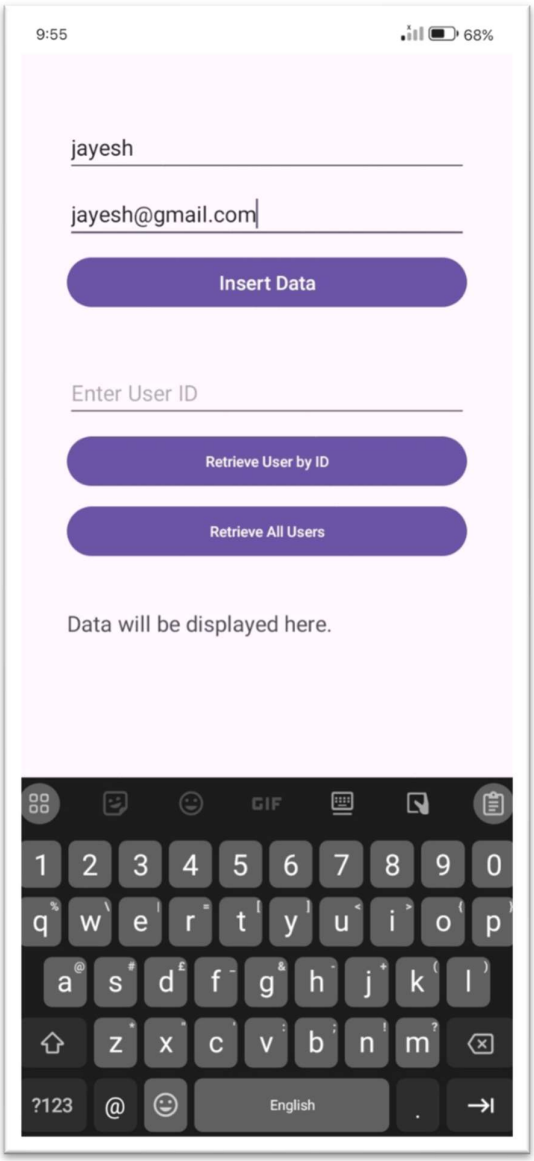
```
        return user;
    }
}
```

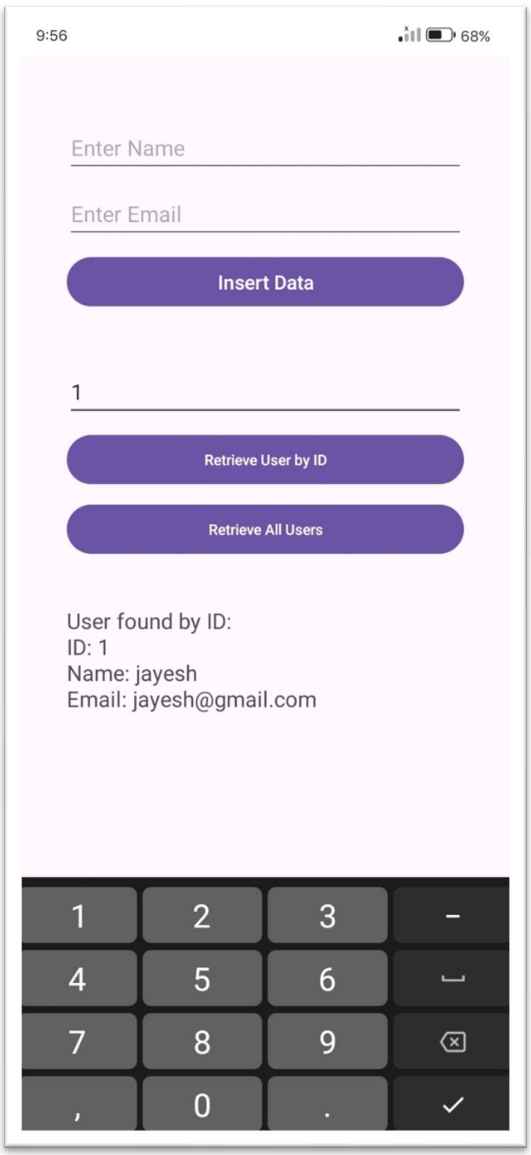
User.java:

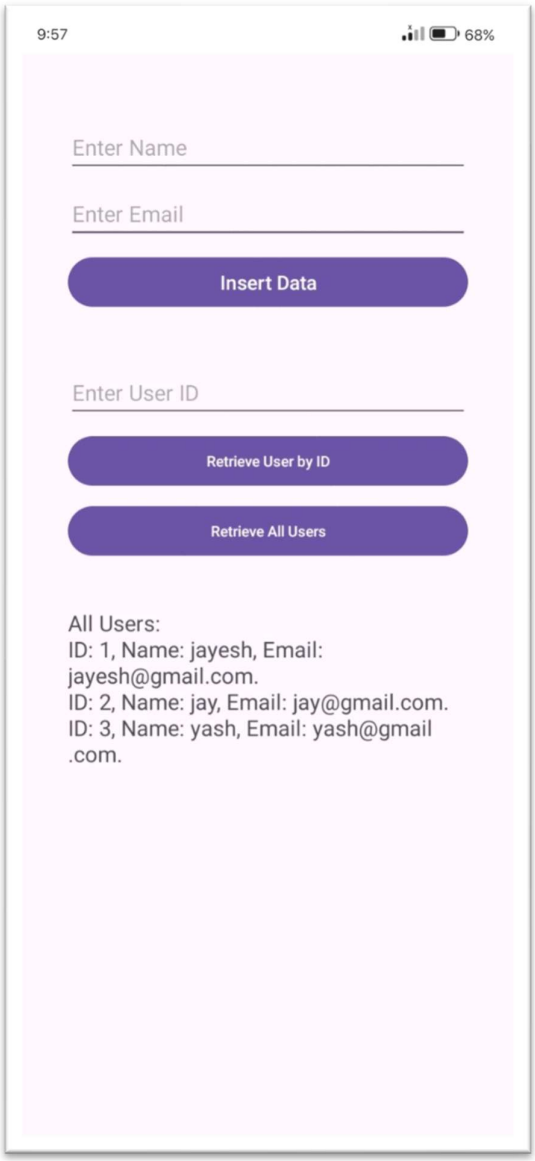
```
package com.example.database;

public class User {
    private long id;
    private String name;
    private String email;
    public User() {

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

    public long getId() {
        return id;
    }
    public void setId(long id) {
        this.id = id;
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public String getEmail() {
        return email;
    }
    public void setEmail(String email) {
        this.email = email;
    }
}
```

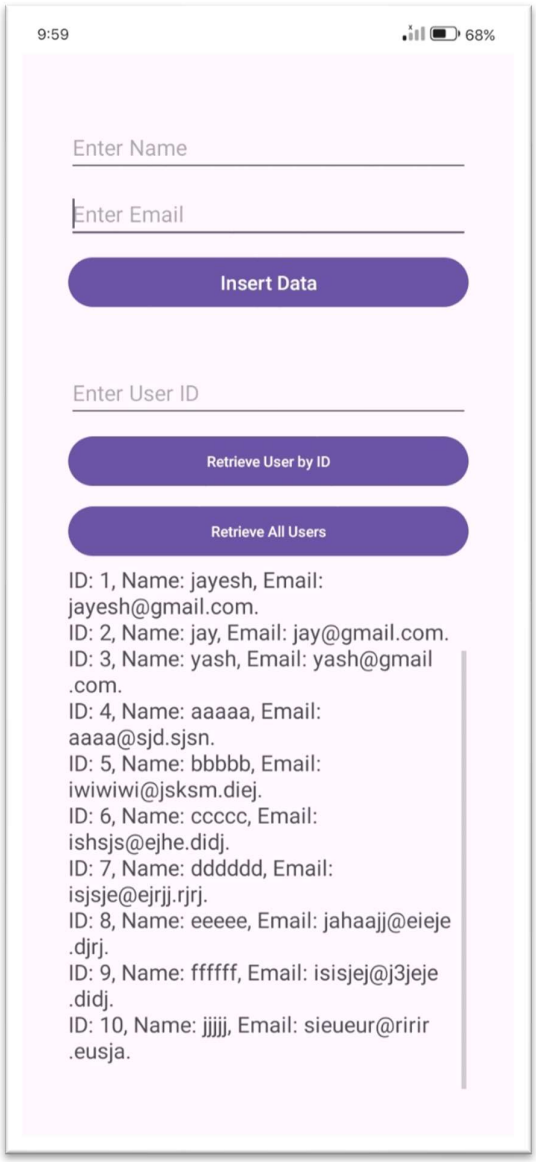
Output:

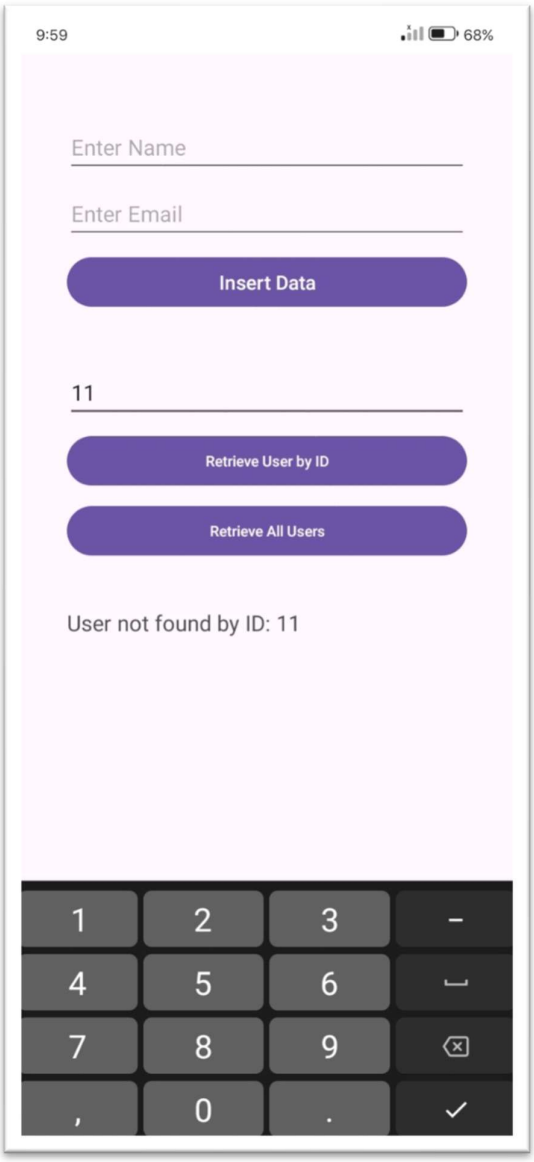

9:55
68%
Enter Name
Enter Email
Insert Data
Enter User ID
Retrieve User by ID
Retrieve All Users
Data will be displayed here.


9:55
68%
jayesh
jayesh@gmail.com
Insert Data
Enter User ID
Retrieve User by ID
Retrieve All Users
Data will be displayed here.
GIF
1 2 3 4 5 6 7 8 9 0
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
?123
@
English
.


9:56
68%
Enter Name
Enter Email
Insert Data
1
Retrieve User by ID
Retrieve All Users
User found by ID:
ID: 1
Name: jayesh
Email: jayesh@gmail.com


9:57
68%
Enter Name
Enter Email
Insert Data
Enter User ID
Retrieve User by ID
Retrieve All Users
All Users:
ID: 1, Name: jayesh, Email: jayesh@gmail.com.
ID: 2, Name: jay, Email: jay@gmail.com.
ID: 3, Name: yash, Email: yash@gmail .com.


9:59
68%
Enter Name
Enter Email
Insert Data
Enter User ID
Retrieve User by ID
Retrieve All Users
ID: 1, Name: jayesh, Email: jayesh@gmail.com.
ID: 2, Name: jay, Email: jay@gmail.com.
ID: 3, Name: yash, Email: yash@gmail.com.
ID: 4, Name: aaaaa, Email: aaaa@sjd.sjsn.
ID: 5, Name: bbbbb, Email: iwiwiwi@jsksm.diej.
ID: 6, Name: ccccc, Email: ishsjs@ejhe.didj.
ID: 7, Name: dddddd, Email: isjsje@ejrjj.rjrj.
ID: 8, Name: eeeee, Email: jahaajj@eieje.djrj.
ID: 9, Name: ffffff, Email: isisjej@j3jeje.didj.
ID: 10, Name: jjjjj, Email: sieueur@ririr.eusja.


9:59
68%
Enter Name
Enter Email
Insert Data
11
Retrieve User by ID
Retrieve All Users
User not found by ID: 11
1
2
3
4
5
6
7
8
9
0