Vishwakarma Government Engineering College

Computer Engineering

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Subject: Mobile Application Development (3170726)
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Practical – 1

AIM: Develop and Mobile Application for following topic

1. Design Login activity and implement control events: Use Edit Text, Checkbox and Buttons

2. Create Activities & implement following

       1. Implicit intent

       2. Explicit Intent

       3. StartActivityForResult

3. Implement activity Lifecycle and State Callbacks

Activity_preactical1.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Practical1">

    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="@drawable/gradient"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <androidx.constraintlayout.widget.ConstraintLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content">

            <ImageView
                android:id="@+id/imageView"
                android:layout_width="120dp"
                android:layout_height="150dp"
                android:layout_marginStart="32dp"
                android:layout_marginLeft="32dp"
                android:layout_marginTop="80dp"
                android:layout_marginEnd="32dp"
                android:layout_marginRight="32dp"
                android:contentDescription="@string/Co512"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toTopOf="parent"
                app:srcCompat="@drawable/co_512" />
```

```xml
            <TextView
                android:id="@+id/errorTxtView"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginBottom="8dp"
                android:text="@string/blank"
                android:textColor="#ff0000"
                android:textSize="20sp"

app:layout_constraintBottom_toTopOf="@+id/editTextTextPersonName"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintHorizontal_bias="0.498"
                app:layout_constraintStart_toStartOf="parent" />

            <EditText
                android:id="@+id/editTextTextPersonName"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginStart="32dp"
                android:layout_marginLeft="32dp"
                android:layout_marginTop="80dp"
                android:layout_marginEnd="32dp"
                android:layout_marginRight="32dp"
                android:background="#11000000"
                android:drawableStart="@drawable/ic_action_username"
                android:drawableLeft="@drawable/ic_action_username"
                android:ems="10"
                android:hint="@string/username_hint"
                android:importantForAutofill="no"
                android:inputType="textPersonName"
                android:padding="10dp"
                android:textColor="#fff"
                android:textColorHint="#9e9e9e"
                android:textSize="20sp"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toBottomOf="@+id/imageView" />

            <EditText
                android:id="@+id/editTextTextPassword"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginStart="32dp"
                android:layout_marginLeft="32dp"
                android:layout_marginTop="16dp"
                android:layout_marginEnd="32dp"
                android:layout_marginRight="32dp"
                android:background="#11000000"
                android:drawableStart="@drawable/ic_action_password"
                android:drawableLeft="@drawable/ic_action_password"
                android:ems="10"
                android:hint="@string/password_hint"
                android:importantForAutofill="no"
                android:inputType="textPassword"
                android:padding="10dp"
                android:textColor="#fff"
                android:textColorHint="#9e9e9e"
```

```
                    android:textSize="20sp"
                    app:layout_constraintEnd_toEndOf="parent"
                    app:layout_constraintStart_toStartOf="parent"

app:layout_constraintTop_toBottomOf="@+id/editTextTextPersonName" />

            <CheckBox
                android:id="@+id/checkBox"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="@string/remember"
                android:textColor="#9e9e9e"
                android:textSize="20sp"

app:layout_constraintStart_toStartOf="@+id/editTextTextPassword"

app:layout_constraintTop_toBottomOf="@+id/editTextTextPassword" />

            <Button
                android:id="@+id/button"
                android:layout_width="300dp"
                android:layout_height="wrap_content"
                android:layout_marginStart="32dp"
                android:layout_marginLeft="32dp"
                android:layout_marginTop="88dp"
                android:layout_marginEnd="32dp"
                android:layout_marginRight="32dp"
                android:background="@drawable/button_background"
                android:onClick="ValidInput"
                android:padding="10dp"
                android:text="@string/login"
                android:textColor="#fff"
                android:textSize="24sp"
                app:backgroundTint="#FA46E8"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintStart_toStartOf="parent"

app:layout_constraintTop_toBottomOf="@+id/editTextTextPassword" />

            <TextView
                android:id="@+id/textView"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginTop="24dp"
                android:layout_marginBottom="32dp"
                android:text="@string/register"
                android:textColor="#fff"
                android:textSize="16sp"
                app:layout_constraintBottom_toBottomOf="parent"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toBottomOf="@+id/button" />

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

Practical1.java

```java
package com.example.madpractical;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class Practical1 extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical1);
        Log.d("lifecycle", "onCreate invoked");
        /* Implicit intent */
        // it is used to communicate between two different apps
        // For example, if you want to show the user a Web page or website,
        // you can use an implicit intent to request that another capable
        // app show a specified Web page or website.
        ImageView imgClick = (ImageView) findViewById(R.id.imageView);
        imgClick.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Toast.makeText(Practical1.this, "You clicked on
collegeek.com", Toast.LENGTH_LONG).show();
                Intent intent = new Intent(Intent.ACTION_VIEW);
                intent.setData(Uri.parse("https://collegeek.com"));
                startActivity(intent);
            }
        });
    }

    /* Control events */
    public void ValidInput(View view) {
        EditText editText = findViewById(R.id.editTextTextPersonName);
        EditText editText1 = findViewById(R.id.editTextTextPassword);
        String username = editText.getText().toString();
        String password = editText1.getText().toString();
        if (username.isEmpty() || password.isEmpty()) {
            TextView textView = findViewById(R.id.errorTxtView);
            textView.setText("Username and Password required!");
        } else {
            /* Explicit intent */
            // use an explicit intent to start a component in your own app,
            // because you know the class name of the activity or service you
            // want to start. For example, you might start a new activity
            // within your app in response to a user action, or start a
```

```java
            // service to download a file in the background.
            Intent intent = new Intent(this, Login_message.class);
            intent.putExtra("Username", username);
            intent.putExtra("Password", password);
            startActivity(intent);
        }
    }

    /* Android Activity Lifecycle */
    // onCreate is above
    @Override
    protected void onStart() {
        super.onStart();
        Log.d("lifecycle", "onStart invoked");
    }

    @Override
    protected void onResume() {
        super.onResume();
        Log.d("lifecycle", "onResume invoked");
    }

    @Override
    protected void onPause() {
        super.onPause();
        Log.d("lifecycle", "onPause invoked");
    }

    @Override
    protected void onStop() {
        super.onStop();
        Log.d("lifecycle", "onStop invoked");
    }

    @Override
    protected void onRestart() {
        super.onRestart();
        Log.d("lifecycle", "onRestart invoked");
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        Log.d("lifecycle", "onDestroy invoked");
    }
}
```
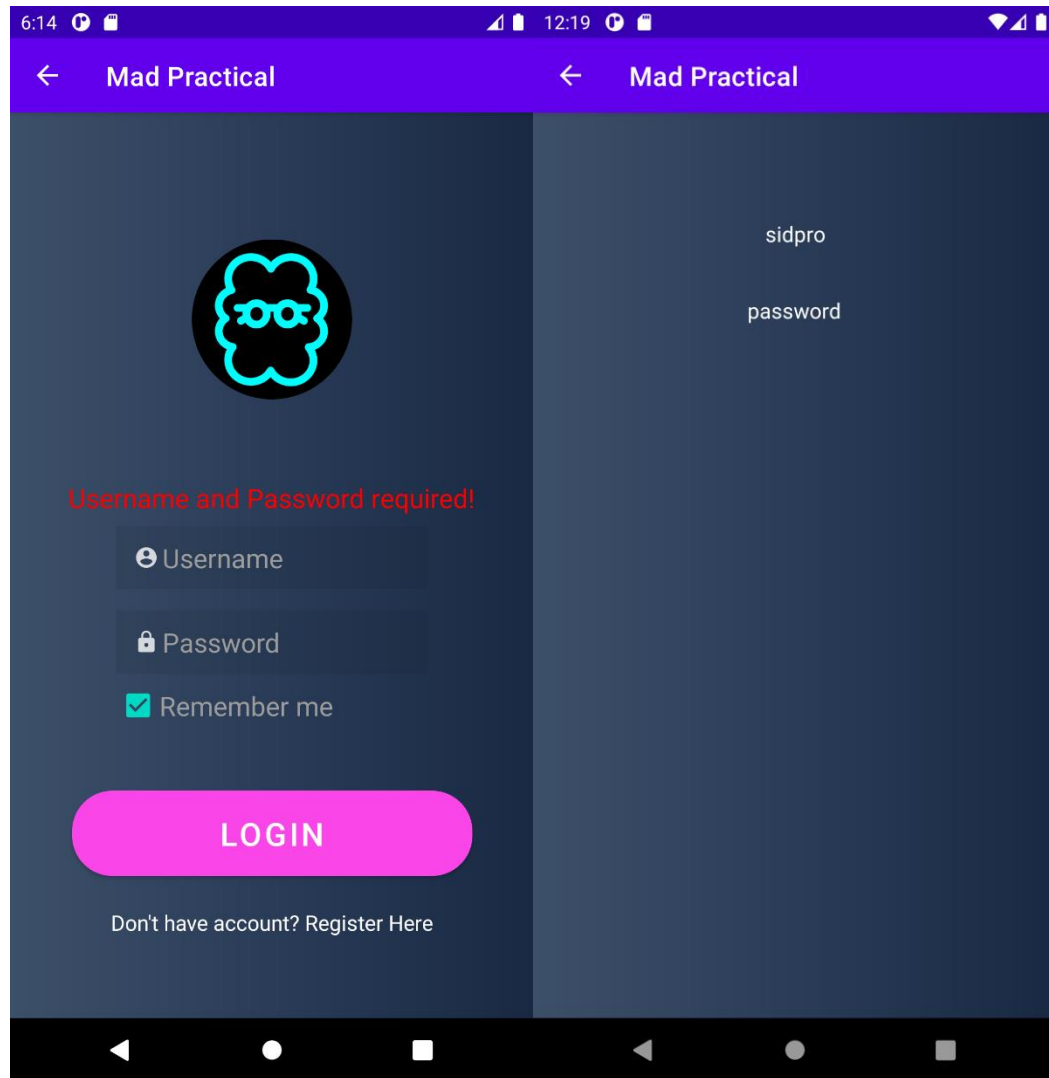
Fig 1.1 and Fig 1.2 Login activity with control events and explicit intent
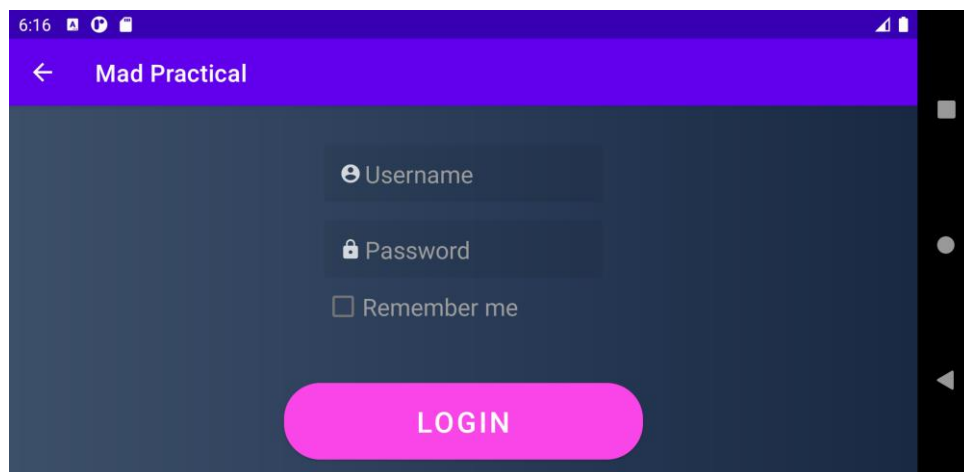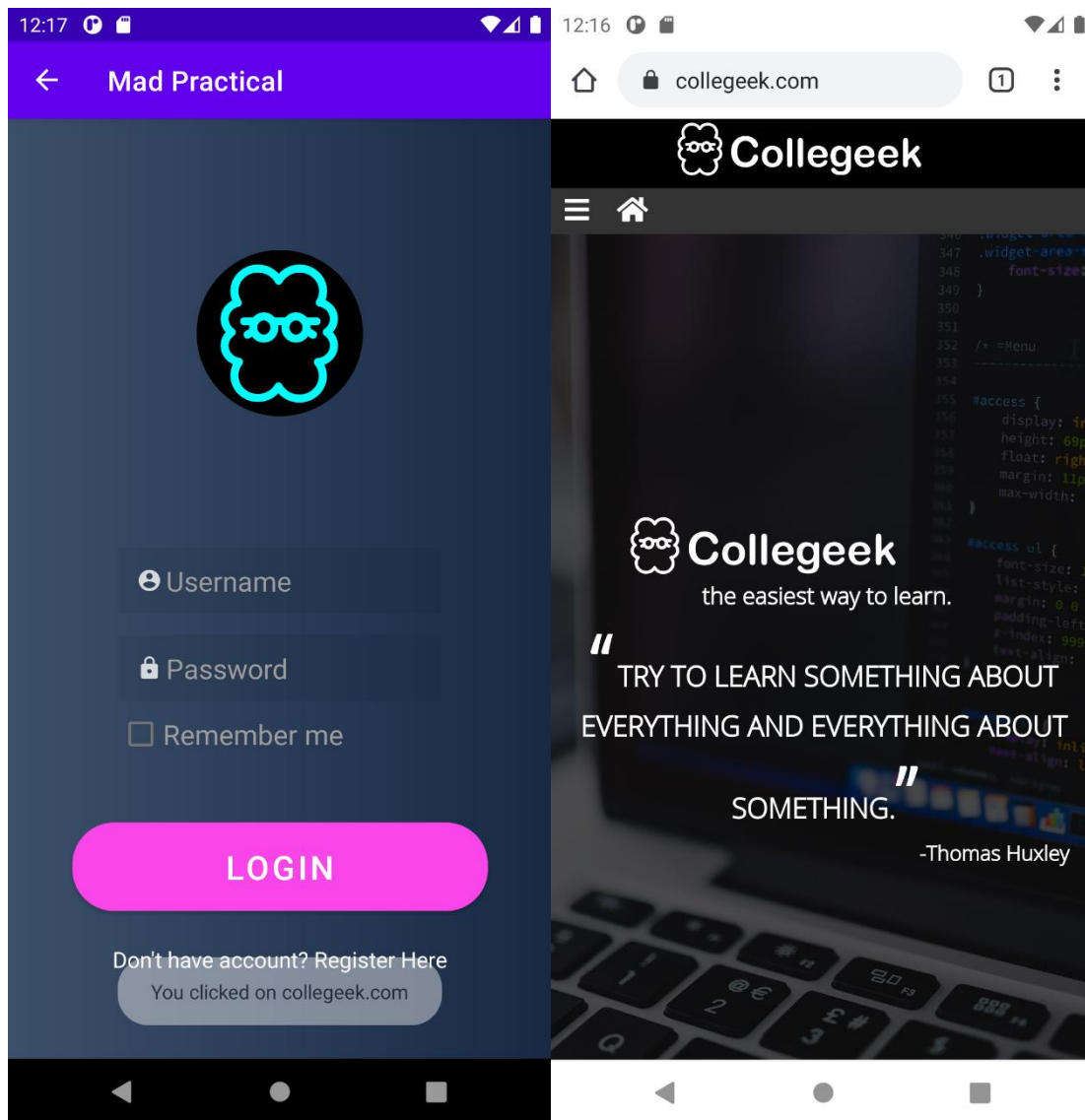

Fig 1.3 Screen compatibility

Fig 1.4 and Fig 1.5 By clicking on image it will open web page using implicit intent

Fig 1.6 Activity life cycle

Practical – 2

AIM: Develop and Mobile Application for following topic

1. Implement Practical 1.1 using following layouts:

      1. Linear Layout

      2. Relative Layout

      3. Table Layout

2. Use an Options Menu

3. Create a Recycler View and list the details of student using following fields:

      1. Name

      2. Address

      3. Photo (Image)

      4. Delete (Button Operation)

Linear Layout.xml

```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:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="@drawable/gradient"
    tools:context=".Practical_2a">

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="120dp"
        android:layout_height="150dp"
        android:layout_marginTop="80dp"
        android:layout_gravity="center"
        android:contentDescription="@string/Co512"
        app:srcCompat="@drawable/co_512" />

    <TextView
        android:id="@+id/errorTxtView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="8dp"
        android:layout_gravity="center"
        android:layout_marginTop="50dp"
        android:text="@string/blank"
        android:textColor="#ff0000"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/editTextTextPersonName"
```

```xml
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:background="#11000000"
        android:drawableStart="@drawable/ic_action_username"
        android:drawableLeft="@drawable/ic_action_username"
        android:ems="10"
        android:hint="@string/username_hint"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
        android:padding="10dp"
        android:textColor="#fff"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/editTextTextPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:layout_gravity="center"
        android:background="#11000000"
        android:drawableStart="@drawable/ic_action_password"
        android:drawableLeft="@drawable/ic_action_password"
        android:ems="10"
        android:hint="@string/password_hint"
        android:importantForAutofill="no"
        android:inputType="textPassword"
        android:padding="10dp"
        android:textColor="#fff"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <CheckBox
        android:id="@+id/checkBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="@string/remember"
        android:textColor="#9e9e9e"
        android:textSize="20sp"
        android:layout_marginStart="-34dp"
        android:layout_marginLeft="-34dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="300dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="48dp"
        android:background="@drawable/button_background"
        android:onClick="ValidInput"
        android:padding="10dp"
        android:text="@string/login"
        android:textColor="#fff"
        android:textSize="24sp"
        app:backgroundTint="#FA46E8" />
```

```xml
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="24dp"
        android:layout_gravity="center"
        android:text="@string/register"
        android:textColor="#fff"
        android:textSize="16sp" />
</LinearLayout>
```

Relative Layout.xml

```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"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:background="@drawable/gradient"
    tools:context=".Practical_2b">

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="120dp"
        android:layout_height="150dp"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="80dp"
        android:contentDescription="@string/Co512"
        app:srcCompat="@drawable/co_512" />

    <TextView
        android:id="@+id/errorTxtView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/imageView"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="50dp"
        android:layout_marginBottom="8dp"
        android:text="@string/blank"
        android:textColor="#ff0000"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/editTextTextPersonName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/errorTxtView"
        android:layout_centerHorizontal="true"
        android:background="#11000000"
        android:drawableStart="@drawable/ic_action_username"
        android:drawableLeft="@drawable/ic_action_username"
        android:ems="10"
        android:hint="@string/username_hint"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
```

```xml
            android:padding="10dp"
            android:textColor="#fff"
            android:textColorHint="#9e9e9e"
            android:textSize="20sp" />

        <EditText
            android:id="@+id/editTextTextPassword"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginTop="16dp"
            android:layout_centerHorizontal="true"
            android:layout_below="@id/editTextTextPersonName"
            android:background="#11000000"
            android:drawableStart="@drawable/ic_action_password"
            android:drawableLeft="@drawable/ic_action_password"
            android:ems="10"
            android:hint="@string/password_hint"
            android:importantForAutofill="no"
            android:inputType="textPassword"
            android:padding="10dp"
            android:textColor="#fff"
            android:textColorHint="#9e9e9e"
            android:textSize="20sp" />

        <CheckBox
            android:id="@+id/checkBox"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@id/editTextTextPassword"
            android:layout_alignStart="@id/editTextTextPassword"
            android:text="@string/remember"
            android:textColor="#9e9e9e"
            android:textSize="20sp"
            android:layout_alignLeft="@id/editTextTextPassword" />

        <Button
            android:id="@+id/button"
            android:layout_width="300dp"
            android:layout_height="wrap_content"
            android:layout_below="@id/checkBox"
            android:layout_centerHorizontal="true"
            android:layout_marginTop="48dp"
            android:background="@drawable/button_background"
            android:onClick="ValidInput"
            android:padding="10dp"
            android:text="@string/login"
            android:textColor="#fff"
            android:textSize="24sp"
            app:backgroundTint="#FA46E8" />

        <TextView
            android:id="@+id/textView2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@id/button"
            android:layout_marginTop="24dp"
            android:layout_centerHorizontal="true"
```

```xml
            android:textColor="#fff"
            android:text="@string/register" />
</RelativeLayout>
```

Table Layout.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<TableLayout 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"
    android:background="@drawable/gradient"
    tools:context=".Practical_2c">

    <TableRow
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center_horizontal"
        android:layout_marginTop="80dp">
        <ImageView
            android:id="@+id/imageView"
            android:layout_width="120dp"
            android:layout_height="150dp"
            android:contentDescription="@string/Co512"
            app:srcCompat="@drawable/co_512" />
    </TableRow>

    <TableRow
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center_horizontal"
        android:layout_marginTop="50dp"
        android:layout_marginBottom="8dp">
        <TextView
            android:id="@+id/errorTxtView"
            android:layout_gravity="center"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/blank"
            android:textColor="#ff0000"
            android:textSize="20sp" />
    </TableRow>

    <TableRow
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center_horizontal">
        <EditText
            android:id="@+id/editTextTextPersonName"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:background="#11000000"
            android:drawableStart="@drawable/ic_action_username"
            android:drawableLeft="@drawable/ic_action_username"
            android:ems="10"
```

```xml
                android:hint="@string/username_hint"
                android:importantForAutofill="no"
                android:inputType="textPersonName"
                android:padding="10dp"
                android:textColor="#fff"
                android:textColorHint="#9e9e9e"
                android:textSize="20sp" />
        </TableRow>

        <TableRow
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:gravity="center_horizontal"
            android:layout_marginTop="16dp">
            <EditText
                android:id="@+id/editTextTextPassword"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_gravity="center"
                android:background="#11000000"
                android:drawableStart="@drawable/ic_action_password"
                android:drawableLeft="@drawable/ic_action_password"
                android:ems="10"
                android:hint="@string/password_hint"
                android:importantForAutofill="no"
                android:inputType="textPassword"
                android:padding="10dp"
                android:textColor="#fff"
                android:textColorHint="#9e9e9e"
                android:textSize="20sp" />
        </TableRow>

        <TableRow
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:gravity="center_horizontal">
            <CheckBox
                android:id="@+id/checkBox"
                android:layout_gravity="center"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="@string/remember"
                android:textColor="#9e9e9e"
                android:textSize="20sp"
                android:layout_marginStart="-70dp"
                android:layout_marginLeft="-70dp"/>
        </TableRow>

        <TableRow
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:gravity="center_horizontal"
            android:layout_marginTop="48dp">

            <Button
                android:id="@+id/button"
                android:layout_width="300dp"
```

```xml
            android:layout_height="wrap_content"
            android:background="@drawable/button_background"
            android:onClick="ValidInput"
            android:padding="10dp"
            android:text="@string/login"
            android:textColor="#fff"
            android:textSize="24sp"
            app:backgroundTint="#FA46E8" />
    </TableRow>

    <TableRow
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center_horizontal"
        android:layout_marginTop="24dp">
        <TextView
            android:id="@+id/textView"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:text="@string/register"
            android:textColor="#fff"
            android:textSize="16sp" />
    </TableRow>

</TableLayout>
```
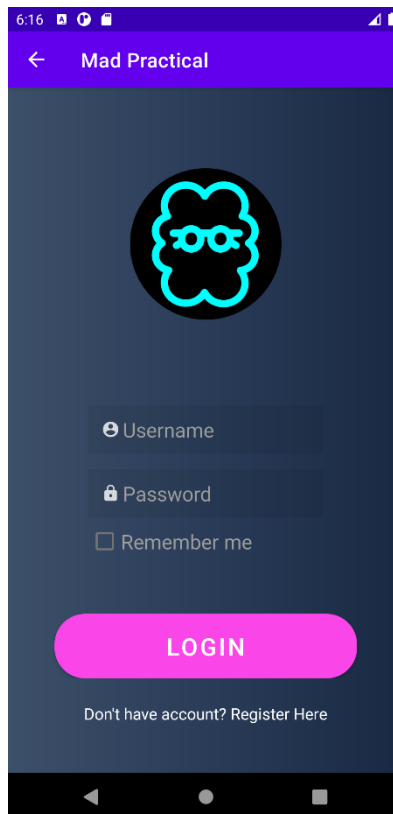

Fig 2.1 – Login Activity

activity_recyclerview.xml

```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=".Practical2d">

    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/recyclerview"
        android:layout_width="match_parent"
        android:layout_height="match_parent">
    </androidx.recyclerview.widget.RecyclerView>
</androidx.constraintlayout.widget.ConstraintLayout>
```

menu_layout.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<menu
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto">
    <item
        android:title=""
        app:showAsAction="always"
        android:icon="@drawable/ic_baseline_white_more_vert"
        android:id="@+id/vec">
        <menu>
            <item
                app:showAsAction="never"
                android:id="@+id/home"
                android:icon="@drawable/ic_baseline_home"
                android:title="@string/home"
                />
            <item
                app:showAsAction="never"
                android:icon="@drawable/ic_baseline_account"
                android:title="@string/profile"
                android:id="@+id/profile"
                />
            <item
                app:showAsAction="never"
                android:icon="@drawable/ic_baseline_exit"
                android:title="@string/exit"
                android:id="@+id/exit"/>
        </menu>
    </item>
</menu>
```

Adapter.java

```java
package com.example.madpractical;

import android.content.Context;
import android.view.LayoutInflater;
```

```java
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.TextView;

import androidx.annotation.NonNull;
import androidx.recyclerview.widget.RecyclerView;

import java.util.List;

public class Adapter extends RecyclerView.Adapter<Adapter.ViewHolder> {

    private List<recyclerModel> studentList;
    private Context context;

    public Adapter(List<recyclerModel> studentList,Context context){
        this.studentList = studentList;
        this.context = context;
    }

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

    @Override
    public void onBindViewHolder(@NonNull Adapter.ViewHolder holder, int
position) {
        int imageview = studentList.get(position).getImageView();
        String name = studentList.get(position).getName();
        String address = studentList.get(position).getAddress();
        holder.delete.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                studentList.remove(position);
                notifyDataSetChanged();
            }
        });
        holder.setData(imageview,name,address);
    }

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

    public class ViewHolder extends RecyclerView.ViewHolder{

        private ImageView imageView;
        private TextView name;
        private TextView address;
```

```java
        private Button delete;


        public ViewHolder(@NonNull View itemView) {
            super(itemView);

            imageView = (ImageView)itemView.findViewById(R.id.imageView);
            name = itemView.findViewById(R.id.name);
            address = itemView.findViewById(R.id.address);
            delete = (Button) itemView.findViewById(R.id.delete);
        }

        public void setData(int imageview, String name, String address) {
            imageView.setImageResource(imageview);
            this.name.setText(name);
            this.address.setText(address);
        }
    }
}
```

recyclerModel.java

```java
package com.example.madpractical;

public class recyclerModel {
    private int imageView;
    private String name;
    private String address;

    public recyclerModel(int imageView, String name, String address) {
        this.imageView = imageView;
        this.name = name;
        this.address = address;
    }

    public int getImageView() {
        return imageView;
    }

    public String getName() {
        return name;
    }

    public String getAddress() {
        return address;
    }
}
```

Practical2d.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;
```

```java
import android.os.Bundle;
import android.view.Menu;
import android.widget.LinearLayout;

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

public class Practical2d extends AppCompatActivity {

    RecyclerView recyclerView;
    LinearLayoutManager layoutManager;
    List<recyclerModel> studentList;
    Adapter adapter;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical3);

        initData();
        initRecyclerView();
    }

    private void initData() {
        studentList = new ArrayList<>();
        studentList.add(new
recyclerModel(R.drawable.sid1,"Siddharth","Gundiyavada, Sayla, Surendranagar,
Gujarat, 363440"));
        studentList.add(new recyclerModel(R.drawable.img3,"Dhruvi","Sun
Plaza, Navrangpura, Ahmedabad, Gujarat 380009"));
        studentList.add(new recyclerModel(R.drawable.img2,"Johny","Jodhpur 4
Rasta, Satellite, Ahmedabad, Gujarat 380015"));
        studentList.add(new recyclerModel(R.drawable.img1,"Apexa","Shefali
House, Ellisbridge, Ahmedabad, Gujarat 380006"));
        studentList.add(new recyclerModel(R.drawable.co_512,"Collegeek","80
Feet Road, Anand Bagh, Surendranagar, Gujarat 363001"));
        studentList.add(new recyclerModel(R.drawable.img4,"Ajay","31nd Floor,
Ghanshyam Chambers, Mithakhali, Ahmedabad, Gujarat 380006"));
    }

    private void initRecyclerView() {
        recyclerView = (RecyclerView) findViewById(R.id.recyclerview);
        layoutManager = new LinearLayoutManager(this);
        layoutManager.setOrientation(RecyclerView.VERTICAL);
        recyclerView.setLayoutManager(layoutManager);
        adapter = new Adapter(studentList,getApplicationContext());
        recyclerView.setAdapter(adapter);
        adapter.notifyDataSetChanged();
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.menu_layout,menu);
        return true;
    }
}
```
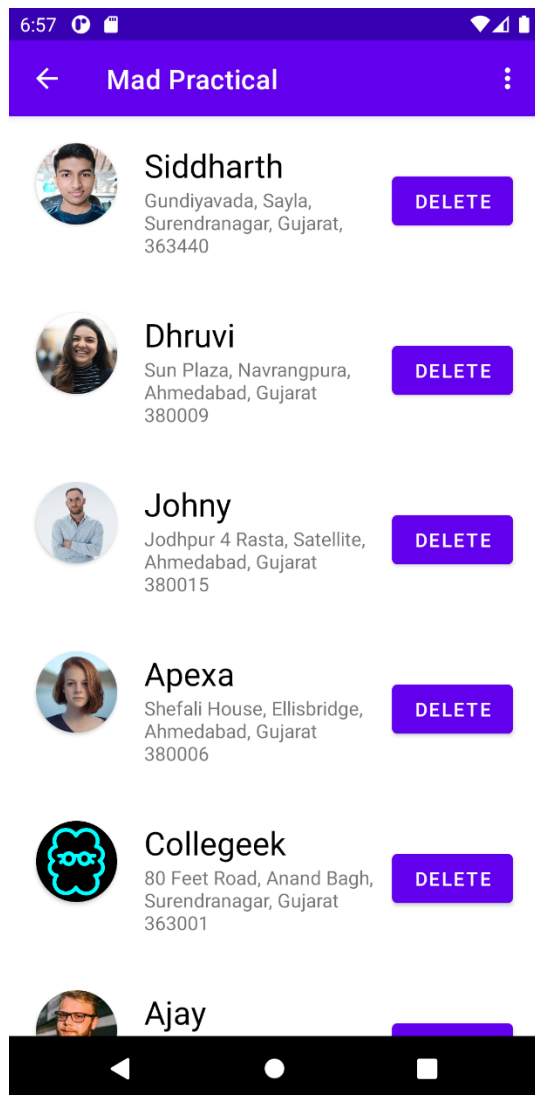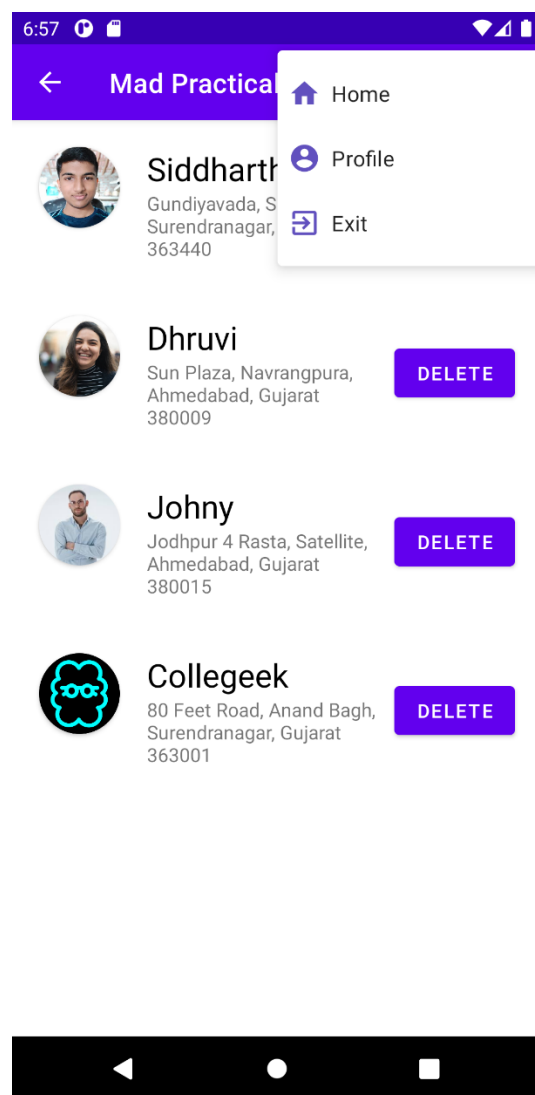
Fig 2.2 Recycler view with Student info   Fig 2.3 Option menu and Delete Operation

Practical – 3

AIM: Develop and Mobile Application for following topic

    1. Theme,

    2. Custom Styles

ThemeActivity.java

```java
public class ThemeActivity extends AppCompatActivity {
    private Spinner spThemes;
    // Here we set the theme for the activity
    // Note `Utils.onActivityCreateSetTheme` must be called before `setContentView`
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        // MUST BE SET BEFORE setContentView
        Utils.onActivityCreateSetTheme(this);
        // AFTER SETTING THEME
        setContentView(R.layout.activity_theme);
        setupSpinnerItemSelection();
    }
    private void setupSpinnerItemSelection() {
        spThemes = (Spinner) findViewById(R.id.spThemes);
        spThemes.setSelection(ThemeApplication.currentPosition);
        ThemeApplication.currentPosition = spThemes.getSelectedItemPosition();
        spThemes.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {

            @Override
            public void onItemSelected(AdapterView<?> parent, View view,
                        int position, long id) {
                if (ThemeApplication.currentPosition != position) {
                    Utils.changeToTheme(ThemeActivity.this, position);
                }
                ThemeApplication.currentPosition = position;
            }
            @Override
            public void onNothingSelected(AdapterView<?> parent) {
            }
        });
```

```
        }
}
```

Layout.xml

```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"
    style="?pageBackground"
    tools:context=".Practical3a">

    <TextView
        android:id="@+id/tvSelectTheme"
        style="?textLarge"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/settings_text_select_theme" />

    <Spinner
        android:id="@+id/spThemes"
        style="?spinner"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/tvSelectTheme"
        android:layout_alignParentRight="true"
        android:layout_marginLeft="@dimen/spinner_margin_left"
        android:layout_toRightOf="@+id/tvSelectTheme"
        android:entries="@array/theme_array"
        android:spinnerMode="dropdown" />

    <RelativeLayout
        android:id="@+id/rlCredentials"
        style="?whiteBackground"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/tvSelectTheme" >

        <TextView
            android:id="@+id/tvCredentials"
            style="?textSubheader"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/settings_text_credentials" />

        <EditText
            android:id="@+id/tvUsername"
            style="?textRegular"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_below="@+id/tvCredentials"
            android:hint="@string/settings_text_username_hint"
            android:inputType="text"
            android:lines="1" />
```

```xml
        <EditText
            android:id="@+id/tvpassword"
            style="?textRegular"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_below="@+id/tvUsername"
            android:layout_marginTop="@dimen/edittext_margin_top"
            android:hint="@string/settings_text_password_hint"
            android:inputType="textPassword"
            android:lines="1" />
    </RelativeLayout>

    <TextView

        android:id="@+id/tvSync"
        style="?textRegular"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/rlCredentials"
        android:text="@string/settings_text_sync_automatically"
        android:textSize="17sp" />
    <CheckBox
        android:id="@+id/checkbox_sync_automatically"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/tvSync"
        android:layout_alignParentRight="true"
        android:checked="true" />
    <TextView
        android:id="@+id/tvLocation"
        style="?textRegular"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/tvSync"
        android:layout_marginTop="@dimen/view_margin"
        android:text="@string/settings_text_location"
        android:textSize="17sp" />

    <Switch
        android:id="@+id/toggle_google"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/tvLocation"
        android:layout_alignParentRight="true"
        android:layout_toRightOf="@+id/tvLocation"
        android:switchTextAppearance="@style/switch_text_appearance"
        android:textOff="@string/settings_text_state_off"
        android:textOn="@string/settings_text_state_on" />

    <Button
        android:id="@+id/btnClearData"
        style="?button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"
        android:layout_marginBottom="@dimen/view_margin"
```

```xml
            android:text="@string/settings_text_clear_data" />

</RelativeLayout>
```

Style.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:android="http://schemas.android.com/apk/res/android" >
    <!--
        Base application theme, dependent on API level. This theme is
replaced
        by AppBaseTheme from res/values-vXX/styles.xml on newer devices.
    -->
    <style name="AppBaseTheme" parent="Theme.AppCompat.Light">
        <!--
            Theme customizations available in newer API levels can go in
            res/values-vXX/styles.xml, while customizations related to
            backward-compatibility can go here.
        -->
    </style>

    <!-- Application theme. -->
    <style name="AppTheme" parent="AppBaseTheme">
        <!-- All customizations that are NOT specific to a particular API-
level can go here. -->
    </style>

    <style name="switch_text_appearance"
parent="@android:style/TextAppearance.Holo.Small">
        <item name="android:textColor">#FFF</item>
    </style>

    <!-- ================================================================== -->

    <!-- Material-Light styles -->

    <!-- ================================================================== -->

    <style name="page_background_wh">
        <item
name="android:background">@drawable/white_gray_gradient_background</item>
        <item
name="android:paddingLeft">@dimen/activity_horizontal_padding</item>
        <item
name="android:paddingRight">@dimen/activity_horizontal_padding</item>
    </style>

    <style name="text_subheader_wh">
        <item name="android:textColor">#000</item>
        <item name="android:textSize">@dimen/text_subheader_text_size</item>
        <item name="android:shadowDy">1.0</item>
        <item name="android:shadowRadius">1</item>
        <item name="android:shadowColor">#000</item>
    </style>

    <style name="text_large_wh">
```

```xml
            <item name="android:textColor">@android:color/background_dark</item>
            <item name="android:textSize">@dimen/text_large_text_size</item>
            <item name="android:shadowDy">1.0</item>
            <item name="android:shadowRadius">1</item>
            <item name="android:shadowColor">#888</item>
            <item name="android:textStyle">bold</item>
            <item
name="android:layout_marginTop">@dimen/text_large_margin_top</item>
    </style>

    <style name="text_regular_wh">
            <item name="android:textColor">@android:color/background_dark</item>
            <item name="android:textSize">@dimen/text_regular_text_size</item>
    </style>

    <style name="white_background_wh">
            <item
name="android:background">@android:drawable/dialog_holo_light_frame</item>
            <item name="android:layout_marginTop">@dimen/card_margin_top</item>
            <item
name="android:layout_marginBottom">@dimen/card_margin_top</item>
            <item name="android:padding">@dimen/white_background_padding</item>
    </style>

    <style name="button_wh" parent="text_large_wh">
            <item name="android:background">@drawable/button_wh</item>
            <item name="android:layout_marginTop">@dimen/view_margin</item>
    </style>

    <style name="spinner_wh">
            <item
name="android:background">@drawable/spinner_wh_background</item>
    </style>

    <style name="horizontal_line_wh">
            <item name="android:background">#00000000</item>
    </style>
    <color name="actionbar_bg_wh">#AFAFAF</color>

    <style name="action_bar_wh"
parent="@style/Widget.AppCompat.Light.ActionBar.Solid.Inverse">
            <item name="android:background">@color/actionbar_bg_wh</item>
            <item name="background">@color/actionbar_bg_wh</item>
    </style>
    <!-- ================================================================ -->
    <!-- Customize YOUR CUSTOM THEME Styles -->
    <!-- Define your own styles below. -->
    <!-- ================================================================ -->
</resources>
```

Thems.xml

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

    <style name="Theme.Material_Light" parent="Theme.AppCompat.Light">
        <item name="pageBackground">@style/page_background_wh</item>
        <item name="textSubheader">@style/text_subheader_wh</item>
        <item name="textLarge">@style/text_large_wh</item>
        <item name="textRegular">@style/text_regular_wh</item>
        <item name="whiteBackground">@style/white_background_wh</item>
        <item name="button">@style/button_wh</item>
        <item name="spinner">@style/spinner_wh</item>
        <item name="actionBarStyle">@style/action_bar_wh</item>
    </style>

    <style name="Theme.YOUR_CUSTOM_THEME" parent="Theme.AppCompat.Light">
        <!-- Define styles for YOUR_CUSTOM_THEME here. -->
    </style>
</resources>
```
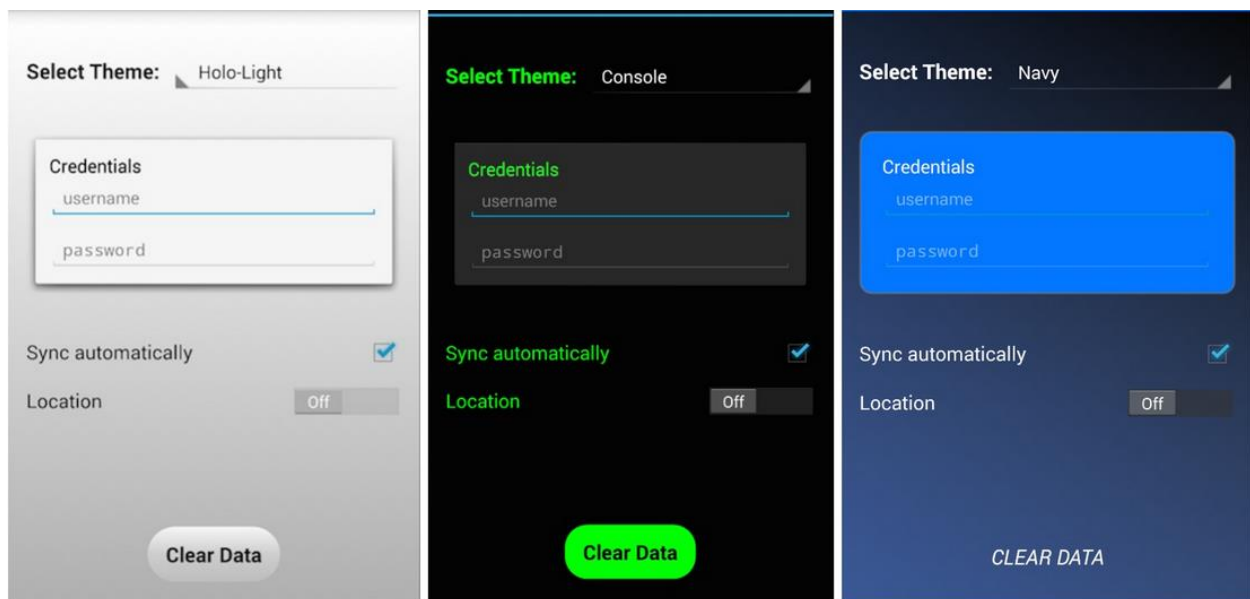

Fig 3.1 Custom style with themes

Practical – 4

AIM: Develop and Mobile Application for storing Data and Retrieve and
Manipulate data Using SQLite database.

Activity_practical4.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Practical4">

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="80dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:text="@string/add_info"
        android:textColor="@color/white"
        android:textSize="32sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/contact_id"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="48dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/contact"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView3" />

    <EditText
```

```xml
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/name"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/contact_id" />

    <EditText
        android:id="@+id/email"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/email"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/name" />

    <EditText
        android:id="@+id/city"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/city"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
```

```xml
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/email" />

    <Button
        android:id="@+id/save_btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:background="@drawable/button_background"
        android:padding="10dp"
        android:text="@string/save"
        android:textColor="#fff"
        android:textSize="24sp"
        app:backgroundTint="#FA46E8"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/city" />

    <Button
        android:id="@+id/view_btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:text="@string/view"
        android:textSize="24sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/save_btn" />

    <Button
        android:id="@+id/delete_btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="24dp"
        android:layout_marginLeft="24dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="24dp"
        android:layout_marginRight="24dp"
        android:text="@string/delete"
        android:textSize="24sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/view_btn" />
```

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

Activity_practical4a.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Practical4a">

    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="@drawable/gradient"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <androidx.constraintlayout.widget.ConstraintLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content">

            <TextView
                android:id="@+id/view_head_text"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginStart="24dp"
                android:layout_marginLeft="24dp"
                android:layout_marginTop="40dp"
                android:layout_marginEnd="24dp"
                android:layout_marginRight="24dp"
                android:text="@string/view_head"
                android:textColor="#fff"
                android:textSize="32sp"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toTopOf="parent" />

            <TextView
                android:id="@+id/data_text"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginStart="32dp"
                android:layout_marginLeft="32dp"
                android:layout_marginTop="32dp"
                android:layout_marginEnd="32dp"
                android:layout_marginRight="32dp"
                android:layout_marginBottom="32dp"
                android:text="@string/nothing"
                android:textColor="#fff"
                android:textSize="20sp"
```

```
                    app:layout_constraintBottom_toBottomOf="parent"
                    app:layout_constraintEnd_toEndOf="parent"
                    app:layout_constraintHorizontal_bias="0.501"
                    app:layout_constraintStart_toStartOf="parent"
                    app:layout_constraintTop_toBottomOf="@+id/view_head_text" />

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

Practical4a.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;

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

public class Practical4a extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical4a);

        Intent intent = getIntent();
        String data = intent.getStringExtra("Data");
        TextView textview = findViewById(R.id.data_text);
        if (!data.isEmpty()) textview.setText(data);
    }
}
```

StudentInfo.java

```java
package com.example.madpractical;

public final class Studentinfo {
    private Studentinfo() {
    }

    public static final String TABLE_NAME = "student_info";
    public static final String NAME = "name";
    public static final String EMAIL = "email";
    public static final String CITY = "city";
    public static final String CONTACT = "contact";
}
```

Practical4.java

```java
package com.example.madpractical;

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

```java
import android.app.AlertDialog;
import android.content.Intent;
import android.database.Cursor;
import android.database.SQLException;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class Practical4 extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical4);

        EditText contact, name, email, city;
        contact = findViewById(R.id.contact_id);
        name = findViewById(R.id.name);
        email = findViewById(R.id.email);
        city = findViewById(R.id.city);

        // save button to insert data
        Button save_btn = findViewById(R.id.save_btn);

        save_btn.setOnClickListener(v -> {
            String Name = name.getText().toString();
            String Contact = contact.getText().toString();
            String City = city.getText().toString();
            String Email = email.getText().toString();

            if (Name.isEmpty() || Contact.isEmpty() || City.isEmpty() ||
Email.isEmpty()) {
                Toast.makeText(Practical4.this, "Every field is required!",
Toast.LENGTH_LONG).show();
            } else {
                StudentDbHelper helper = new
StudentDbHelper(getApplicationContext());
                SQLiteDatabase db = helper.getWritableDatabase();
                helper.addInfo(Contact, Name, Email, City, db);
                helper.close();
                name.setText("");
                contact.setText("");
                email.setText("");
                city.setText("");
                Toast.makeText(Practical4.this, "Student Info saved
Successfully", Toast.LENGTH_LONG).show();
            }
        });

        // view button to read data
        Button view_btn = findViewById(R.id.view_btn);

        view_btn.setOnClickListener(v -> {
```

```java
            StudentDbHelper helper = new
StudentDbHelper(getApplicationContext());
            SQLiteDatabase db = helper.getReadableDatabase();
            Cursor cursor = helper.readInfo(db);

            String info = "";

            while (cursor.moveToNext()) {
                String id =
cursor.getString(cursor.getColumnIndex(Studentinfo.CONTACT));
                String name1 =
cursor.getString(cursor.getColumnIndex(Studentinfo.NAME));
                String City =
cursor.getString(cursor.getColumnIndex(Studentinfo.CITY));
                String Email =
cursor.getString(cursor.getColumnIndex(Studentinfo.EMAIL));
                info = info + "\n\nID: " + id + "\nName: " + name1 +
"\nEmail: " + Email + "\nCity: " + City;
            }

            Intent intent = new Intent(Practical4.this, Practical4a.class);
            intent.putExtra("Data", info);
            startActivity(intent);
        });

        // delete data by id
        Button delete_btn = findViewById(R.id.delete_btn);

        delete_btn.setOnClickListener(this::btn_showMessage);

    }

    public void btn_showMessage(View view) {
        final AlertDialog.Builder alert = new
AlertDialog.Builder(Practical4.this);

        // get layout
        View dialog_layout_view =
getLayoutInflater().inflate(R.layout.dilog_layout, null);

        EditText txt_inputText = (EditText)
dialog_layout_view.findViewById(R.id.txt_input);
        Button btn_cancel = (Button)
dialog_layout_view.findViewById(R.id.btn_cancel);
        Button btn_okay = (Button)
dialog_layout_view.findViewById(R.id.btn_okay);

        // insert layout into dialog box
        alert.setView(dialog_layout_view);
        // create dialog box
        final AlertDialog alertDialog = alert.create();
        // around area : false
        alertDialog.setCanceledOnTouchOutside(false);

        // on cancel
        btn_cancel.setOnClickListener(v -> alertDialog.dismiss());
```

```java
        // on okay
        btn_okay.setOnClickListener(v -> {
            StudentDbHelper helper = new
StudentDbHelper(getApplicationContext());
            SQLiteDatabase db = helper.getWritableDatabase();
            String Id = txt_inputText.getText().toString();
            if (!Id.isEmpty()) {
                helper.deleteInfo(Id, db);
                helper.close();
                txt_inputText.setText("");
                Toast.makeText(Practical4.this, "Student Info Deleted
Successfully", Toast.LENGTH_LONG).show();
            } else {
                Toast.makeText(Practical4.this, "Student ID is required!",
Toast.LENGTH_LONG).show();
            }
            alertDialog.dismiss();
        });

        alertDialog.show();
    }

}
```

StudentDbHelper.java

```java
package com.example.madpractical;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import android.util.Log;

public class StudentDbHelper extends SQLiteOpenHelper {

    public static final String DATABASE_NAME = "student_db";
    public static final int DATABASE_VERSION = 1;


    // create table query
    public static final String CREATE_TABLE = "create table " +
Studentinfo.TABLE_NAME + "(" +
            Studentinfo.CONTACT + " text," +
            Studentinfo.NAME + " text," +
            Studentinfo.EMAIL + " text," +
            Studentinfo.CITY + " text)";

    public static final String DROP_TABLE = "drop table if exists " +
Studentinfo.TABLE_NAME;

    public StudentDbHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
        Log.d("Database Operation", "Database Created...");
    }
```

```java
    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL(CREATE_TABLE);
        Log.d("Database Operation", "Table Created...");
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion)
{
        db.execSQL(DROP_TABLE);
        onCreate(db);
    }

    // insert data into table
    public void addInfo(String id, String name, String email, String city,
SQLiteDatabase db) {
        // to store key value pair
        ContentValues contentValues = new ContentValues();
        // column name => value
        contentValues.put(Studentinfo.CONTACT, id);
        contentValues.put(Studentinfo.NAME, name);
        contentValues.put(Studentinfo.EMAIL, email);
        contentValues.put(Studentinfo.CITY, city);

        db.insert(Studentinfo.TABLE_NAME, null, contentValues);
        Log.d("Database Operation", "row(s) inserted...");
    }

    // read from table
    public Cursor readInfo(SQLiteDatabase db) {
        String[] projections = {Studentinfo.CONTACT, Studentinfo.NAME,
Studentinfo.EMAIL, Studentinfo.CITY};
        Cursor cursor = db.query(Studentinfo.TABLE_NAME, projections, null,
null, null, null, null);
        return cursor;
    }

    // delete
    public void deleteInfo(String id, SQLiteDatabase db) {
        String selection = Studentinfo.CONTACT + " = " + id;
        db.delete(Studentinfo.TABLE_NAME, selection, null);
        Log.d("Database Operation", "row(s) deleted...");
    }

}
```

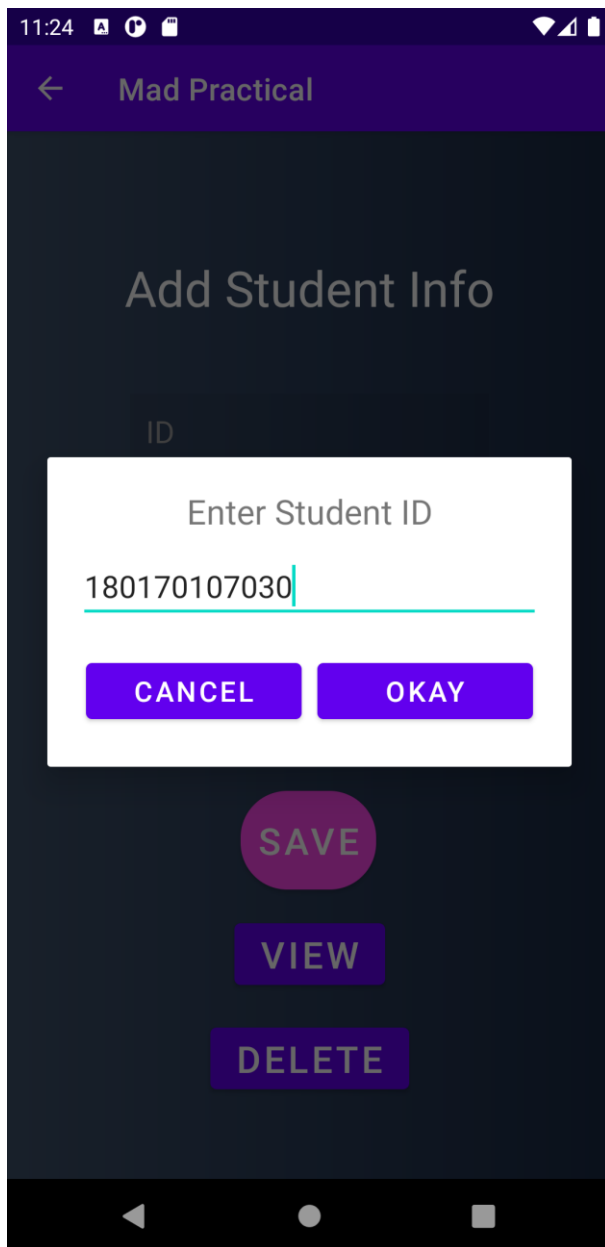Fig 4.1 Add student data to database   Fig 4.2 view student data
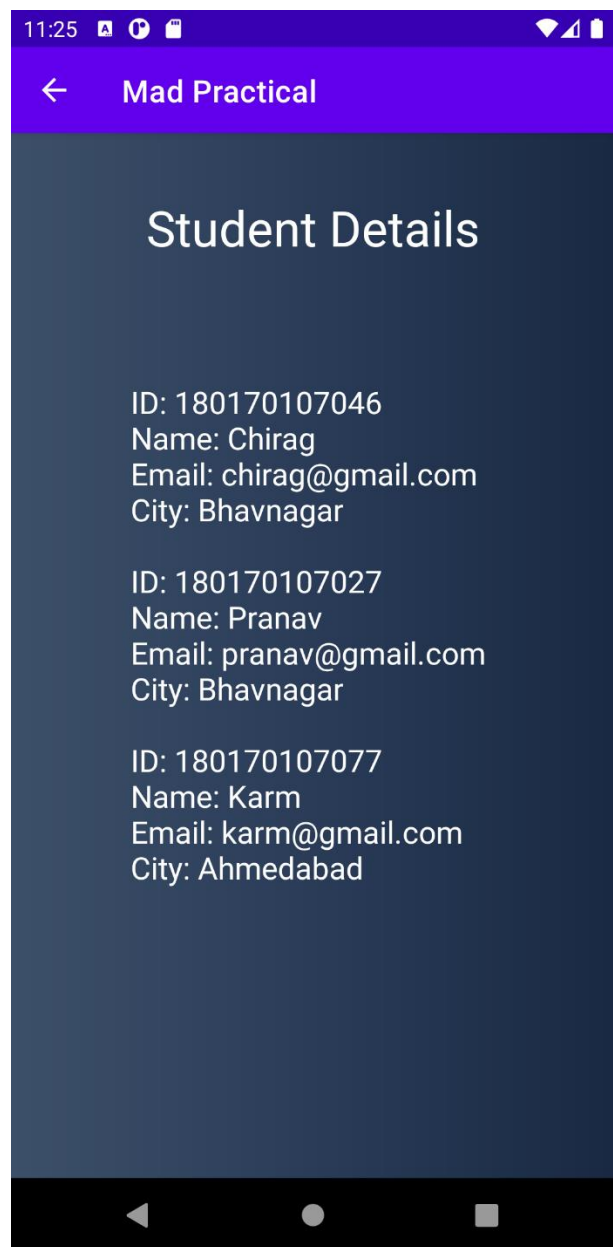
Fig 4.3 Delete Operation

Fig 4.4 After Delete Operation

Practical – 5

AIM: Develop and Mobile Application for following topic

1. Use an AsyncTask to access remote database (make a use of simple PhP Web service)
2. Use Retrofit to access remote database (make a use of simple PhP Web service)

activity_Practical5a.xml

```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:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="@drawable/gradient"
    tools:context=".Practical5a">

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

        <TextView
            android:id="@+id/view_head_text"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textColor="#fff"
            android:textSize="24sp"
            android:text="@string/view_head" />

        <ImageView
            android:id="@+id/reload_icon"
            android:layout_width="42dp"
            android:src="@drawable/ic_reload"
            android:layout_height="42dp"/>

    </LinearLayout>

    <ListView
        android:id="@+id/list_view"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:textColor="#fff"
        android:padding="20dp"
        android:textSize="24sp" />

</LinearLayout>
```

Practical5a.java

```java
package com.example.madpractical;

import android.app.ProgressDialog;
import android.os.AsyncTask;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.ImageView;
import android.widget.ListView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

import org.json.JSONArray;
import org.json.JSONObject;

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.UnsupportedEncodingException;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.ArrayList;

public class Practical5a extends AppCompatActivity implements
View.OnClickListener {

    ListView listStudent;
    ImageView refresh;
    ArrayList<String> list_student;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical5a);
        refresh = findViewById(R.id.reload_icon);
        listStudent = findViewById(R.id.list_view);
        refresh.setOnClickListener(this);
    }

    @Override
    public void onClick(View v) {
        ReadData readData = new ReadData();
        //readData.execute(new String[]{"https://collegeek.com/"});
        readData.execute(new
String[]{"http://192.168.43.217/MAD/readjson.php"});
    }

    private class ReadData extends AsyncTask<String, Void, Boolean> {

        ProgressDialog dialog = new ProgressDialog(Practical5a.this);

        @Override
```

```java
        protected void onPreExecute() {
            dialog.setMessage("Reading Data...");
            dialog.show();
        }

        @Override
        protected Boolean doInBackground(String... data) {
            InputStream stream;
            for (String data1 : data) {
                try {
                    URL url = new URL(data1);
                    HttpURLConnection con = (HttpURLConnection)
url.openConnection();
                    con.setRequestMethod("GET");
                    con.connect();

                    stream = con.getInputStream();

                    BufferedReader reader;
                    String text = "";

                    reader = new BufferedReader(new InputStreamReader(stream,
"iso-8859-1"), 8);
                    String line;
                    while ((line = reader.readLine()) != null) {
                        text += line + "\n";
                    }
                    //Log.d("Data",text);
                    stream.close();

                    list_student = new ArrayList<>();
                    JSONArray jsonArray = new JSONArray(text);
                    for (int i = 0; i < jsonArray.length(); ++i) {
                        JSONObject jsonObject = jsonArray.getJSONObject(i);
                        list_student.add(jsonObject.getString("en_no"));
                        list_student.add(jsonObject.getString("firstname"));
                        list_student.add(jsonObject.getString("email"));
                        list_student.add(jsonObject.getString("city"));
                        list_student.add(" ");
                    }

                } catch (Exception e) {
                    Log.d("Error", e.toString());
                    return false;
                }
            }
            return true;
        }

        @Override
        protected void onPostExecute(Boolean result) {
            if (result) {
                Toast.makeText(Practical5a.this, "Read Data Success",
Toast.LENGTH_LONG).show();
                ArrayAdapter<String> arrayAdapter = new
ArrayAdapter<String>(Practical5a.this, R.layout.simple_list, list_student);
```

```java
                listStudent.setAdapter(arrayAdapter);
            } else {
                Log.d("Error", "Error");
            }
            dialog.dismiss();
        }
    }
}
```

simple_list.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/sample_text"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Medium Text"
    android:textStyle="bold"
    android:textAppearance="?android:attr/textAppearanceMedium"
    android:layout_marginTop="5dp"
    android:padding="2dp"
    android:textColor="#fff"
    />
```

Connection.php

```php
<?php

    $server_name = "localhost";
    $user_name = "root";
    $password = "";

    $con = mysqli_connect($server_name,$user_name,$password) or die('Server
Error: '.mysqli_error());

    $database_name = "madman";
    mysqli_select_db($con,$database_name) or die("DB Error:
".mysqli_error());
    mysqli_query($con,"SET NAMES 'utf8'");
?>
```

Readjson.php

```php
<?php

    include_once("connection.php");

    $query = "SELECT en_no,firstname,email,city from studentinfo";
    $result = mysqli_query($con,$query) or die("Error in query: $query
".mysqli_error());

    while($row=mysqli_fetch_assoc($result)){
        $output[] = $row;
    }
    print(json_encode($output));
?>
```
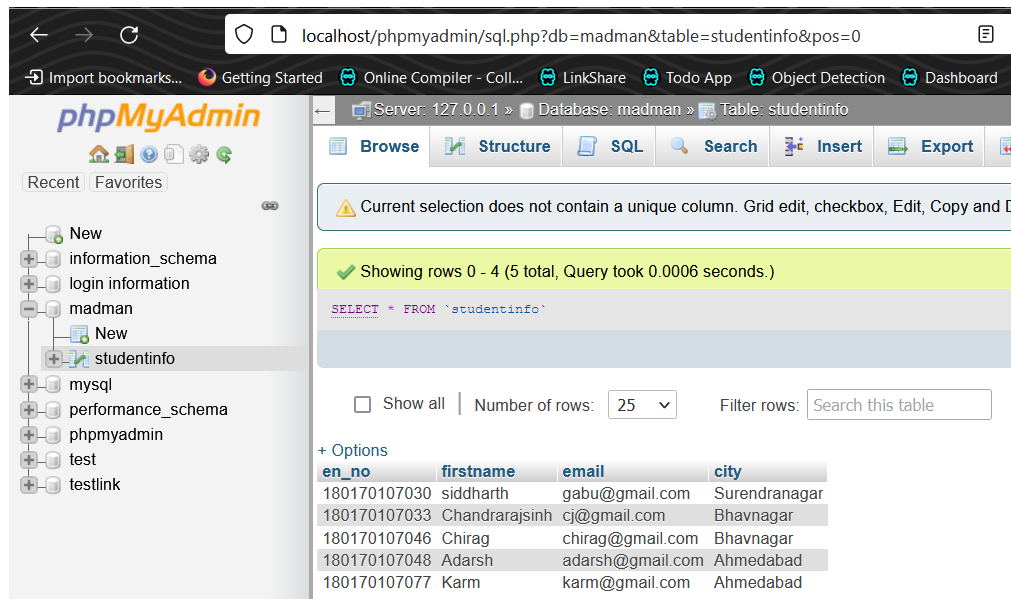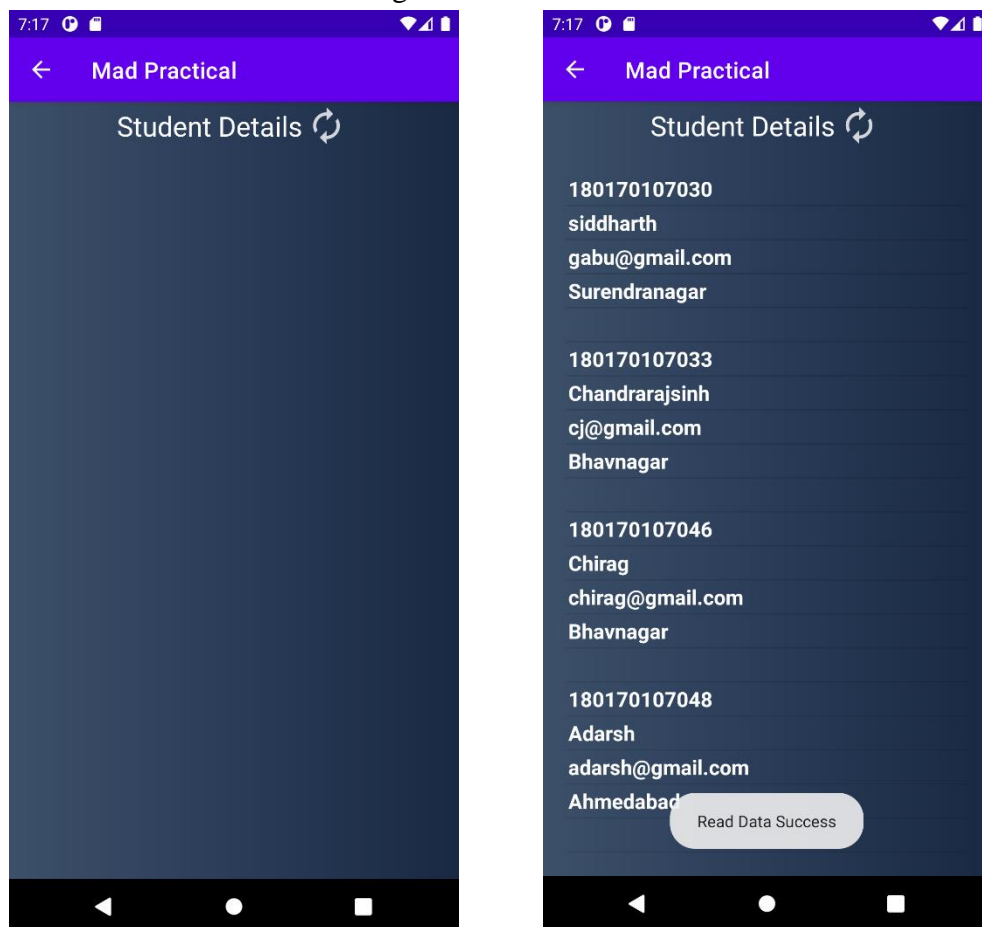
Fig 5a.1 – remote database

Fig5a.2 & 5a.3 - Use of Simple PHP web service to access remote database

activity_Practical5b.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Practical5b">

    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

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

            <TextView
                android:id="@+id/textView5"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_marginTop="10dp"
                android:gravity="center_horizontal"
                android:text="Data From Web Service"
                android:textAlignment="center"
                android:textColor="#fff"
                android:textSize="24sp" />

            <TextView
                android:id="@+id/text_retrofit"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_margin="20dp"
                android:text="@string/blank"
                android:textColor="#fff"
                android:textSize="20sp" />

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

JsonPlaceHolderApi.java

```java
package com.example.madpractical;

import java.util.List;

import retrofit2.Call;
```

```java
import retrofit2.http.GET;

public interface JsonPlaceHolderApi {
    // posts is relative url of https://jsonplaceholder.typicode.com/posts
    // to guide retrofit we have to annotate
    @GET("posts")
    Call<List<Post>> getPosts();
    // retrofit will autogenerate all code
    // to get result
}
```

Post.java

```java
package com.example.madpractical;

import com.google.gson.annotations.SerializedName;

public class Post {

    private int userId;
    private int id;
    private String title;
    // this will bind body variable of json result to text variable
    @SerializedName("body")
    private String text;

    public int getUserId() {
        return userId;
    }

    public int getId() {
        return id;
    }

    public String getTitle() {
        return title;
    }

    public String getText() {
        return text;
    }
}
```

Practical5b.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;

import android.app.ProgressDialog;
import android.os.Bundle;
import android.widget.TextView;

import java.util.List;

import retrofit2.Call;
import retrofit2.Callback;
```

```java
import retrofit2.Response;
import retrofit2.Retrofit;
import retrofit2.converter.gson.GsonConverterFactory;

public class Practical5b extends AppCompatActivity {

    private TextView textResult;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical5b);

        textResult = findViewById(R.id.text_retrofit);
        Retrofit retrofit = new Retrofit.Builder()
                .baseUrl("https://jsonplaceholder.typicode.com/")
                .addConverterFactory(GsonConverterFactory.create())
                .build();

        JsonPlaceHolderApi jsonPlaceHolderApi =
retrofit.create(JsonPlaceHolderApi.class);//getposts() method body created
        ProgressDialog dialog = new ProgressDialog(Practical5b.this);
        dialog.setMessage("Reading Data...");
        dialog.show();
        Call<List<Post>> call = jsonPlaceHolderApi.getPosts();
        // execute will run on main thread causing app to stop for second(s)
        // enqueue will run on separate thread
        call.enqueue(new Callback<List<Post>>() {
            @Override
            public void onResponse(Call<List<Post>> call,
Response<List<Post>> response) {
                if(!response.isSuccessful()){
                    textResult.setText("Code: "+response.code());
                    return;
                }
                List<Post> posts = response.body();
                for(Post post: posts){
                    String content="";
                    content += "ID: "+ post.getId() + "\n";
                    content += "User ID: "+ post.getUserId() + "\n";
                    content += "Title: "+ post.getTitle() + "\n";
                    content += "Text: "+ post.getText() + "\n\n";

                    textResult.append(content);
                }
                dialog.dismiss();
            }

            @Override
            public void onFailure(Call<List<Post>> call, Throwable t) {
                textResult.setText(t.getMessage());
            }
        });
    }
}
```
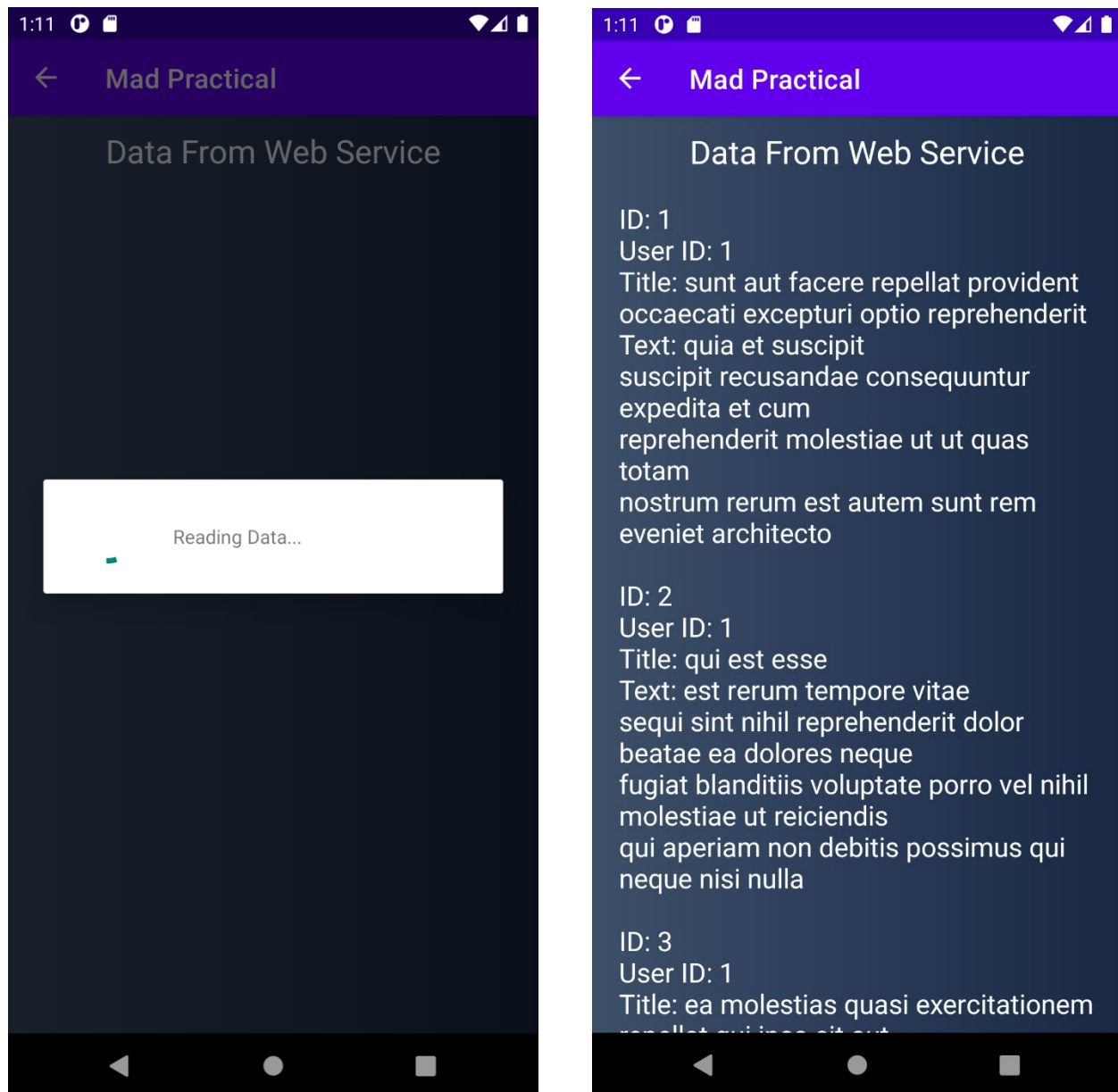
Fig 5b.1 & Fig 5b.2 Reading Data from Web Service using Retrofit

Practical – 6

AIM: Develop and Mobile Application for following topic

1. Get and Save User Preferences
2. Use Firebase to perform CRUID

activity_practical6.xml

```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:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@drawable/gradient"
    android:orientation="vertical"
    tools:context=".Practical6">

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="120dp"
        android:layout_height="150dp"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="80dp"
        android:contentDescription="@string/Co512"
        app:srcCompat="@drawable/co_512" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="48dp"
        android:text="@string/add_info"
        android:textColor="@color/white"
        android:textSize="32sp" />

    <EditText
        android:id="@+id/contact_id"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="48dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/contact"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView3" />
```

```xml
    <EditText
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="16dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/name"
        android:importantForAutofill="no"
        android:inputType="textPersonName"
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/email"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="16dp"
        android:background="#11000000"
        android:ems="10"
        android:hint="@string/email"
        android:importantForAutofill="no"
        android:inputType="textEmailAddress"
        android:padding="10dp"
        android:textColor="#9e9e9e"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="20dp"
        android:orientation="horizontal">

        <Button
            android:id="@+id/save_btn"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginRight="10dp"
            android:padding="10dp"
            android:text="@string/save"
            android:textColor="#fff"
            android:textSize="24sp" />

        <Button
            android:id="@+id/view_btn"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginLeft="10dp"
            android:padding="10dp"
            android:text="@string/view"
```

```xml
            android:textColor="#fff"
            android:textSize="24sp" />

    </LinearLayout>

</LinearLayout>
```

recycler_firebase.xml

```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"
    android:layout_width="match_parent"
    android:layout_height="125dp">

    <TextView
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:text="@string/siddharth"
        android:textColor="@color/white"
        android:textSize="24sp" />

    <TextView
        android:id="@+id/contact_id"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/name"
        android:layout_marginLeft="20dp"
        android:text="180170107030"
        android:textColor="#9e9e9e"
        android:textSize="20sp" />

    <TextView
        android:id="@+id/email"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/contact_id"
        android:layout_marginLeft="20dp"
        android:text="gabu@gmail.com"
        android:textColor="#9e9e9e"
        android:textSize="20sp" />

    <Button
        android:id="@+id/update"
        android:layout_width="95dp"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_alignParentRight="true"
        android:layout_marginTop="15dp"
        android:layout_marginRight="20dp"
        android:text="@string/update" />

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

```xml
            android:layout_width="95dp"
            android:layout_height="wrap_content"
            android:layout_alignParentRight="true"
            android:layout_alignParentBottom="true"
            android:layout_marginRight="20dp"
            android:layout_marginBottom="15dp"
            android:text="@string/delete" />

</RelativeLayout>
```

activity_practical6a.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Practical6a">

    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/recyclerview_fire"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

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

Practical6.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;

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

public class Practical6 extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical6);

        EditText id = findViewById(R.id.contact_id);
        EditText name = findViewById(R.id.name);
        EditText email = findViewById(R.id.email);
        Button save_btn = findViewById(R.id.save_btn);
        Button view_btn = findViewById(R.id.view_btn);
        DAOstudent dao = new DAOstudent();

        save_btn.setOnClickListener(v -> {
```

```java
            String Id = id.getText().toString();
            String Name = name.getText().toString();
            String Email = email.getText().toString();
            if (Id.isEmpty() || Name.isEmpty() || Email.isEmpty()) {
                Toast.makeText(this, "All Fields required!",
Toast.LENGTH_LONG).show();
            } else {
                Student student = new Student(Id, Name, Email);
                // save user details in SharedPreferences
                SharedPreferences preferences =
getSharedPreferences("student_info", MODE_PRIVATE);
                SharedPreferences.Editor editor = preferences.edit();
                editor.putString("id", Id);
                editor.putString("name", Name);
                editor.putString("email", Email);
                editor.apply();
                dao.add(student).addOnSuccessListener(suc -> {
                    Toast.makeText(this, "Record is inserted",
Toast.LENGTH_LONG).show();
                    id.setText("");
                    name.setText("");
                    email.setText("");
                }).addOnFailureListener(er -> {
                    Toast.makeText(this, er.getMessage(),
Toast.LENGTH_LONG).show();
                });
            }
        });

        // get data from preferences
        SharedPreferences preferences = getSharedPreferences("student_info",
MODE_PRIVATE);
        String Id = preferences.getString("id", "");
        String Name = preferences.getString("name", "");
        String Email = preferences.getString("email", "");
        id.setText(Id);
        name.setText(Name);
        email.setText(Email);

        view_btn.setOnClickListener(v -> {
            Intent intent = new Intent(this, Practical6a.class);
            startActivity(intent);
        });
    }
}
```

Practical6a.java

```java
package com.example.madpractical;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;


import android.app.ProgressDialog;
```

```java
import android.os.AsyncTask;
import android.os.Bundle;
import android.util.Log;
import android.view.Menu;
import android.widget.ArrayAdapter;
import android.widget.Toast;


import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.ValueEventListener;

import org.json.JSONArray;
import org.json.JSONObject;

import java.io.BufferedReader;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.ArrayList;
import java.util.List;

public class Practical6a extends AppCompatActivity {

    RecyclerView recyclerView;
    LinearLayoutManager layoutManager;
    List<Student> studentList = new ArrayList<>();
    Adapter_fire adapter;
    ProgressDialog dialog;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical6a);
        initRecyclerView();
        dialog = new ProgressDialog(Practical6a.this);
        ReadData readData = new ReadData();
        readData.execute(new
String[]{"http://192.168.43.217/MAD/readjson.php"});
    }

    private class ReadData extends AsyncTask<String, Void, Boolean> {

        @Override
        protected void onPreExecute() {
            dialog.setMessage("Reading Data...");
            dialog.show();
        }

        @Override
        protected Boolean doInBackground(String... data) {
            FirebaseDatabase db = FirebaseDatabase.getInstance();
            DatabaseReference databaseReference =
db.getReference(Student.class.getSimpleName());
```

```java
        databaseReference.addValueEventListener(new ValueEventListener()
{
                @Override
                public void onDataChange(@NonNull DataSnapshot snapshot) {
                    for (DataSnapshot snap : snapshot.getChildren()) {
                        Student student = snap.getValue(Student.class);
                        studentList.add(student);
                        //Log.d("FireBase",student.getName());

//Log.d("FireBase",Integer.toString(studentList.size()));
                    }
                    adapter.notifyDataSetChanged();
                }

                @Override
                public void onCancelled(@NonNull DatabaseError error) {
                    Log.d("FireBase", error.toString());
                }
            });

            return true;
        }

        @Override
        protected void onPostExecute(Boolean result) {
            if (result) {
                Toast.makeText(Practical6a.this, "Read Data Success",
Toast.LENGTH_LONG).show();
                Log.d("Post FireBase", Integer.toString(studentList.size()));
            } else {
                Log.d("Error", "Error");
            }
            dialog.dismiss();
        }
    }

    private void initRecyclerView() {
        recyclerView = findViewById(R.id.recyclerview_fire);
        layoutManager = new LinearLayoutManager(this);
        layoutManager.setOrientation(RecyclerView.VERTICAL);
        recyclerView.setLayoutManager(layoutManager);
        adapter = new Adapter_fire(studentList, Practical6a.this);
        recyclerView.setAdapter(adapter);
    }

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

}
```

Adapter_fire.java

```java
package com.example.madpractical;

import android.app.AlertDialog;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import androidx.annotation.NonNull;
import androidx.recyclerview.widget.RecyclerView;

import com.google.firebase.database.DataSnapshot;

import java.util.HashMap;
import java.util.List;

public class Adapter_fire extends
RecyclerView.Adapter<Adapter_fire.ViewHolder> {

    private List<Student> studentList;
    private Context context;

    public Adapter_fire(List<Student> studentList, Context context) {
        this.studentList = studentList;
        this.context = context;
    }

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

    @Override
    public void onBindViewHolder(@NonNull Adapter_fire.ViewHolder holder, int
position) {
        String id = studentList.get(position).getId();
        String name = studentList.get(position).getName();
        String email = studentList.get(position).getEmail();
        holder.delete.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String id = studentList.get(position).getId();
                DAOstudent dao = new DAOstudent();
                dao.delete(id).addOnSuccessListener(suc -> {
                    Toast.makeText(context, "Record is Deleted",
Toast.LENGTH_LONG).show();
                }).addOnFailureListener(er -> {
```

```java
                        Toast.makeText(context, er.getMessage(),
Toast.LENGTH_LONG).show();
                });
                // due to addValueEventListener it will add all value again
in list
                // to remove duplicate we clear list first than notify change
                studentList.clear();
                notifyDataSetChanged();
            }
        });
        holder.update.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                final AlertDialog.Builder alert = new
AlertDialog.Builder(context);

                // get context : pain in ass
                LayoutInflater inflater = LayoutInflater.from(context);
                // get layout from inflater
                View dialog_layout_view =
inflater.inflate(R.layout.dialog_layout_fire, null);
                // to recognize student by click on recycler view
                String id = studentList.get(position).getId();

                EditText name = (EditText)
dialog_layout_view.findViewById(R.id.name);
                EditText email = (EditText)
dialog_layout_view.findViewById(R.id.email);

                Button btn_cancel = (Button)
dialog_layout_view.findViewById(R.id.btn_cancel);
                Button btn_okay = (Button)
dialog_layout_view.findViewById(R.id.btn_okay);

                // insert layout into dialog box
                alert.setView(dialog_layout_view);
                // create dialog box
                final AlertDialog alertDialog = alert.create();
                // around area : false
                alertDialog.setCanceledOnTouchOutside(false);

                // on cancel
                btn_cancel.setOnClickListener(v1 -> alertDialog.dismiss());
                // on okay
                btn_okay.setOnClickListener(v1 -> {
                    String Name = name.getText().toString();
                    String Email = email.getText().toString();

                    if (Name.isEmpty() || Email.isEmpty()) {
                        Toast.makeText(context, "Student ALL info is
required!", Toast.LENGTH_LONG).show();
                    } else {
                        DAOstudent daOstudent = new DAOstudent();

                        HashMap<String, Object> hashMap = new HashMap<>();
                        hashMap.put("name", Name);
```

```java
                        hashMap.put("email", Email);
                        daOstudent.update(id,
hashMap).addOnSuccessListener(suc -> {
                            Toast.makeText(context, "Student Info Updated
Successfully", Toast.LENGTH_LONG).show();
                        }).addOnFailureListener(er -> {
                            Toast.makeText(context, er.getMessage(),
Toast.LENGTH_LONG).show();
                        });
                        // due to addValueEventListener it will add all value
again in list
                        // to remove duplicate we clear list first than
notify change
                        studentList.clear();
                        notifyDataSetChanged();
                    }
                    alertDialog.dismiss();
                });

                alertDialog.show();

                //studentList.remove(position);
                //notifyDataSetChanged();
            }
        });
        holder.setData(id, name, email);
    }

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

    public class ViewHolder extends RecyclerView.ViewHolder {

        private TextView id;
        private TextView name;
        private TextView email;
        private Button delete;
        private Button update;


        public ViewHolder(@NonNull View itemView) {
            super(itemView);

            id = itemView.findViewById(R.id.contact_id);
            name = itemView.findViewById(R.id.name);
            email = itemView.findViewById(R.id.email);
            delete = (Button) itemView.findViewById(R.id.delete);
            update = (Button) itemView.findViewById(R.id.update);
        }

        public void setData(String id, String name, String email) {
            this.id.setText(id);
            this.name.setText(name);
            this.email.setText(email);
        }
```

```
    }
}
```

DAOstudent.java

```java
package com.example.madpractical;

import android.util.Log;

import androidx.annotation.NonNull;

import com.google.android.gms.tasks.Task;
import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.ValueEventListener;

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

public class DAOstudent {
    private DatabaseReference databaseReference;

    public DAOstudent() {
        FirebaseDatabase db = FirebaseDatabase.getInstance();
        databaseReference = db.getReference(Student.class.getSimpleName());
    }

    public Task<Void> add(Student student) {
        return databaseReference.child(student.getId()).setValue(student);
    }

    public Task<Void> update(String key, HashMap<String, Object> hashMap) {
        return databaseReference.child(key).updateChildren(hashMap);
    }
    // we can use read operation from here also but somehow it's not working
    // due to main thread, we have run it using AsyncTask in separate thread


    /*public void read(List<Student> studentList){
        databaseReference.addValueEventListener(new ValueEventListener() {
            @Override
            public void onDataChange(@NonNull DataSnapshot snapshot) {
                for(DataSnapshot snap:snapshot.getChildren()){
                    Student student = snap.getValue(Student.class);
                    studentList.add(new
Student(student.getId(),student.getName(),student.getEmail()));
                    Log.d("FireBase",student.getName());
                    Log.d("FireBase",Integer.toString(studentList.size()));
                }
            }
            @Override
            public void onCancelled(@NonNull DatabaseError error) {
                Log.d("FireBase",error.toString());
            }
```

```
        });
        //Log.d("FireBase",studentList.get(0).getName());
    }*/
    public Task<Void> delete(String key) {
        return databaseReference.child(key).removeValue();
    }
}

}
```
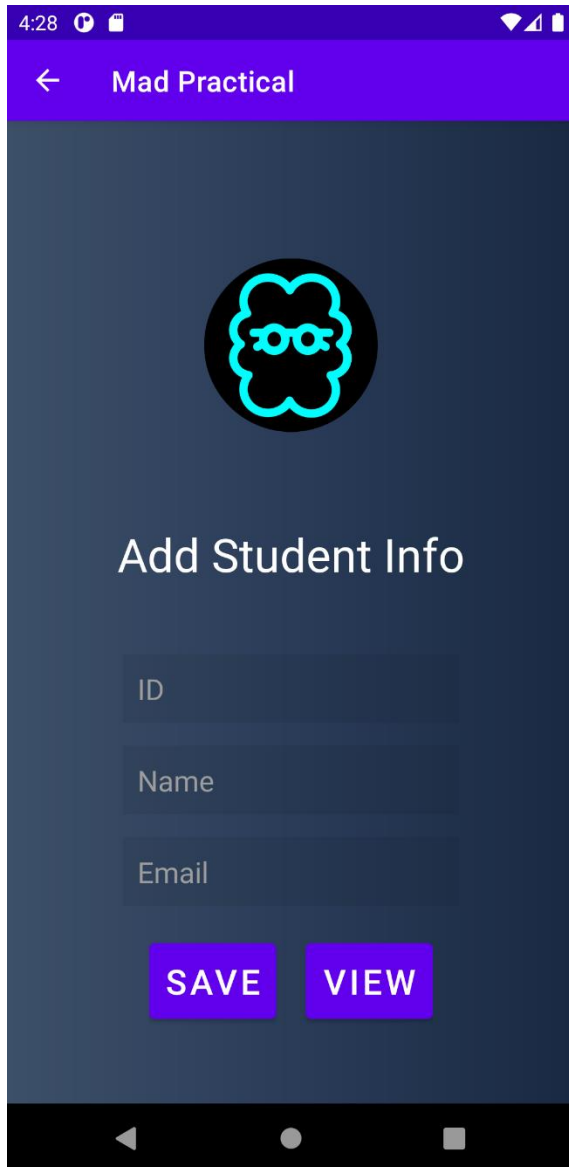

Fig 6.1 – Add to Firebase
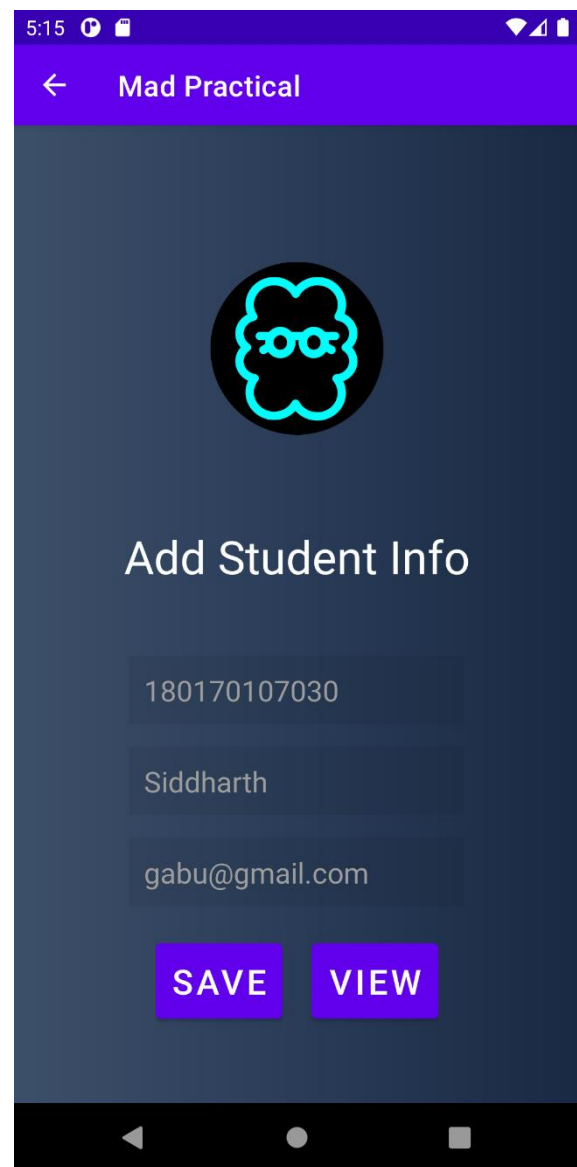
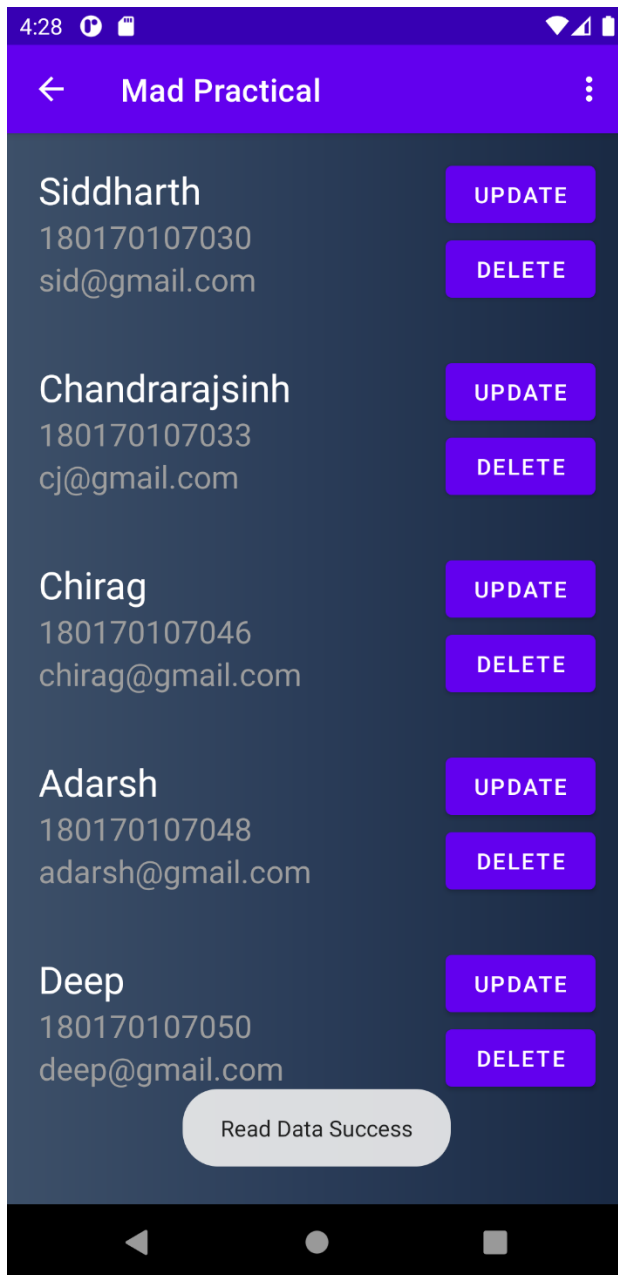Fig 6.2 – User Preferences after user
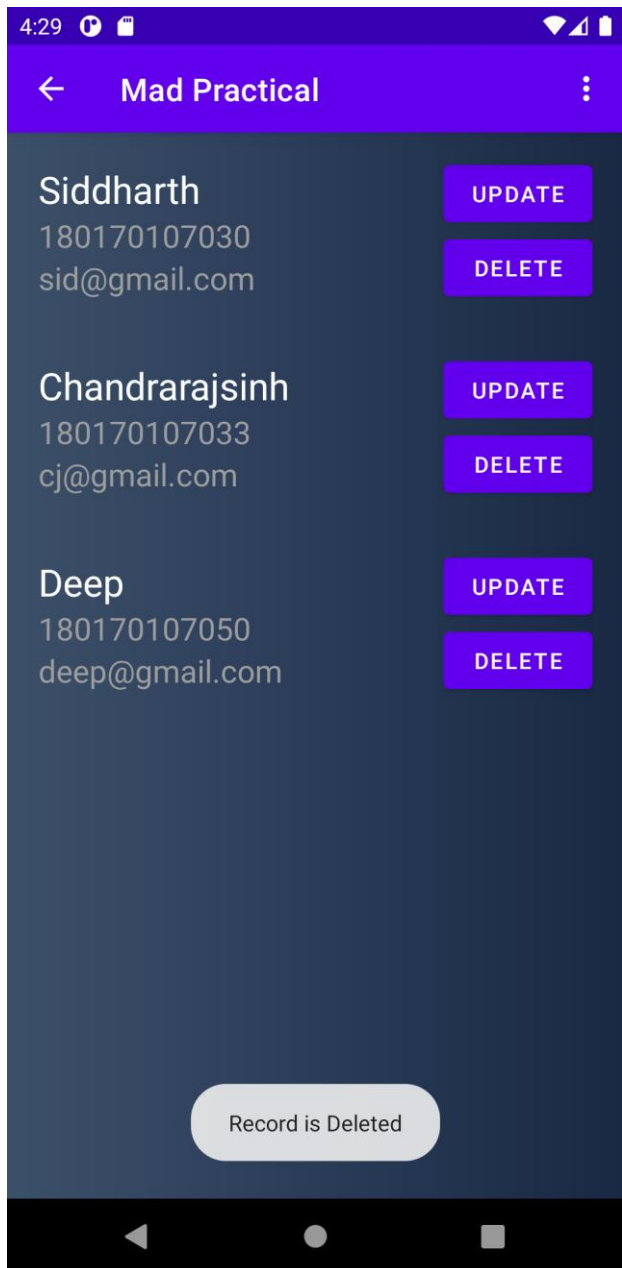Open app again

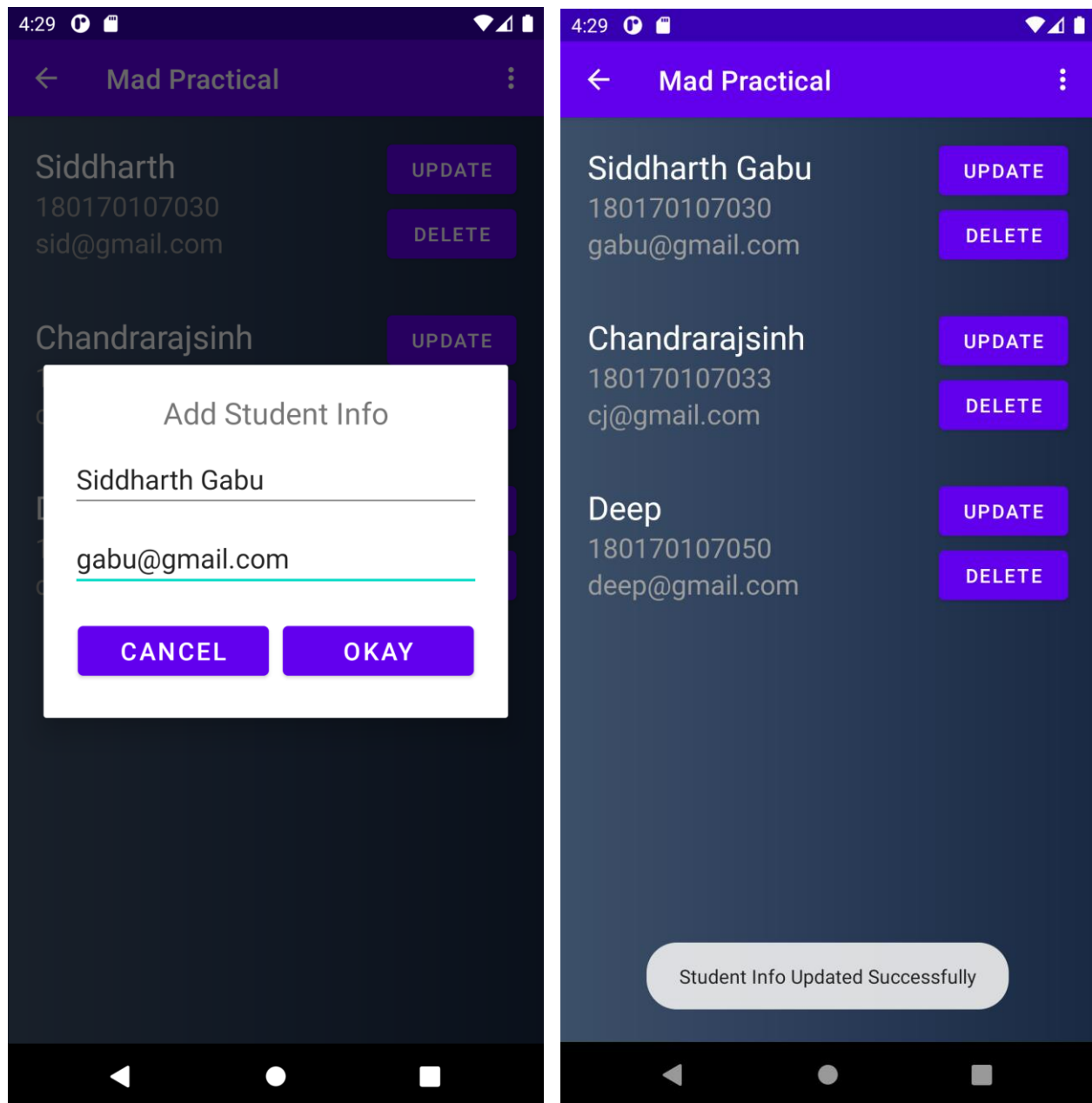Fig 6.3 – Read Data from Firebase   Fig 6.4 – Delete Data from firebase

Fig 6.5 & Fig 6.6 Updating Student Info into firebase Database

Practical – 7

AIM: Develop and Mobile Application for following topic
       1. BroadcastReceiver
       2. Notifications

activity_practical7.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Practical7">

    <TextView
        android:id="@+id/brod_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="TextView"
        android:textSize="24sp"
        android:textColor="@color/white"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/notify"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Notify"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.496"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/brod_text"
        app:layout_constraintVertical_bias="0.135" />

    <TextView
        android:id="@+id/textView6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/broad_cast_text"
        android:textSize="20sp"
        android:textColor="@color/white"
        app:layout_constraintBottom_toTopOf="@+id/brod_text"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
```

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

Practical7.java

```java
package com.example.madpractical;

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

import android.app.Notification;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.content.Intent;
import android.content.IntentFilter;
import android.net.ConnectivityManager;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class Practical7 extends AppCompatActivity {
    BroadcastReceiverExample broad;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical7);

        // BroadcastReceiver
        TextView brod_text = findViewById(R.id.brod_text);
        broad = new BroadcastReceiverExample(brod_text);
        // if we register this BroadcastReceiver by putting it in manifest
file then it's statically register.
        // but here we have done dynamically
        registerReceiver(broad,new
IntentFilter(Intent.ACTION_BATTERY_CHANGED));
        registerReceiver(broad,new
IntentFilter(Intent.ACTION_BOOT_COMPLETED));
        registerReceiver(broad,new
IntentFilter(Intent.ACTION_POWER_CONNECTED));
        registerReceiver(broad,new
IntentFilter(Intent.ACTION_AIRPLANE_MODE_CHANGED));
        registerReceiver(broad,new
IntentFilter(ConnectivityManager.CONNECTIVITY_ACTION));
        // Notification
        if(Build.VERSION.SDK_INT >= Build.VERSION_CODES.O){
            NotificationChannel channel = new NotificationChannel("Mad
Practical","Mad Practical", NotificationManager.IMPORTANCE_DEFAULT);
            NotificationManager manager =
getSystemService(NotificationManager.class);
            manager.createNotificationChannel(channel);
        }

        Button notify = findViewById(R.id.notify);
        notify.setOnClickListener(new View.OnClickListener() {
```

```
            @Override
            public void onClick(View v) {
                // create notification
                NotificationCompat.Builder builder = new
NotificationCompat.Builder(Practical7.this,"Mad Practical");
                builder.setContentTitle("MAD Practical");
                builder.setContentText("Alert: You are viewing Practical
7!");
                builder.setSmallIcon(R.drawable.ic_stat_name);
                builder.setAutoCancel(true);

                // notify user
                NotificationManagerCompat managerCompat =
NotificationManagerCompat.from(Practical7.this);
                managerCompat.notify(1,builder.build());
            }
        });

    }

    @Override
    protected void onStop() {
        super.onStop();
        unregisterReceiver(broad);
    }
}
```

BroadcastReceiverExample.java

```
package com.example.madpractical;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.net.ConnectivityManager;
import android.widget.TextView;
import android.widget.Toast;
/*
Broadcast in android is the system-wide events that can occur when the device
starts,
when a message is received on the device or when incoming calls are received,
or when a
device goes to airplane mode, etc. Broadcast Receivers are used to respond to
these
system-wide events. Broadcast Receivers allow us to register for the system
and application
events, and when that event happens, then the register receivers get
notified.
There are mainly two types of Broadcast Receivers:
Static Broadcast Receivers: These types of Receivers are declared in the
manifest file and works even if the app is closed.
Dynamic Broadcast Receivers: These types of receivers work only if the app is
active or minimized.
*/
// if we register this BroadcastReceiver by putting it in manifest file then
it's statically register.
// here we have done dynamically and statically also.
```

```java
public class BroadcastReceiverExample extends BroadcastReceiver {

    TextView brod_text;

    BroadcastReceiverExample(){}

    BroadcastReceiverExample(TextView txt){
        brod_text = txt;
    }

    @Override
    public void onReceive(Context context, Intent intent) {
        if (Intent.ACTION_BOOT_COMPLETED.equals(intent.getAction())) {
            Toast.makeText(context, "Boot completed",
Toast.LENGTH_SHORT).show();
        }
        if
(ConnectivityManager.CONNECTIVITY_ACTION.equals(intent.getAction())) {
            Toast.makeText(context, "Internet Connectivity changed",
Toast.LENGTH_SHORT).show();
        }
        if(Intent.ACTION_BATTERY_CHANGED.equals(intent.getAction())){
            //Toast.makeText(context, "Battery Changed",
Toast.LENGTH_SHORT).show();
            int percentage = intent.getIntExtra("level",0);
            if(percentage!=0){
                brod_text.setText("Battery Level: "+percentage+"%");
            }
        }
        if(Intent.ACTION_POWER_CONNECTED.equals(intent.getAction())){
            Toast.makeText(context, "Power Connected",
Toast.LENGTH_SHORT).show();
        }
        if(Intent.ACTION_AIRPLANE_MODE_CHANGED.equals(intent.getAction())){
            Toast.makeText(context, "Airplane Mode Changed",
Toast.LENGTH_SHORT).show();
        }
    }
}
```
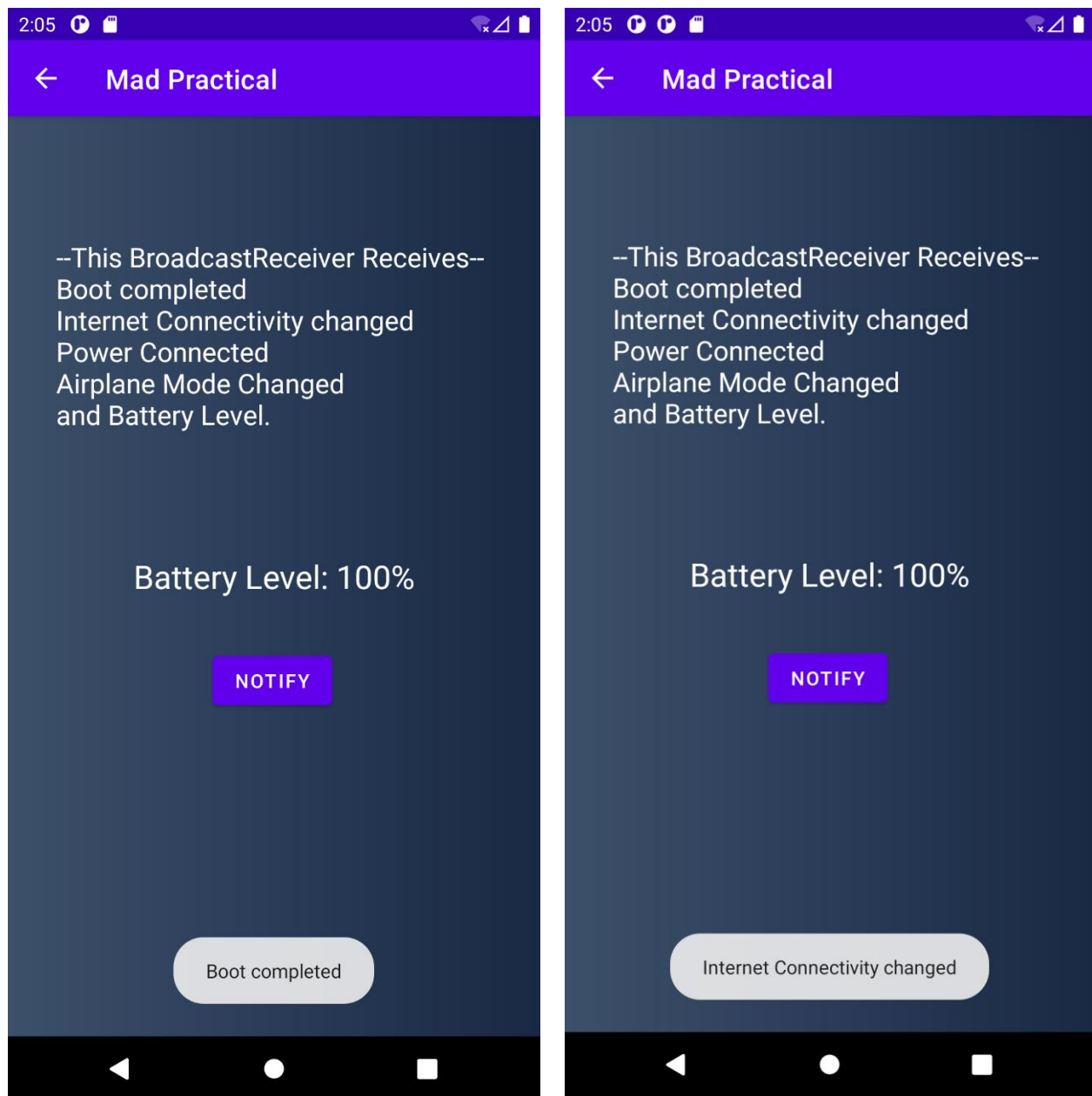
Fig 7.1 & Fig 7.2 Broadcast receiver
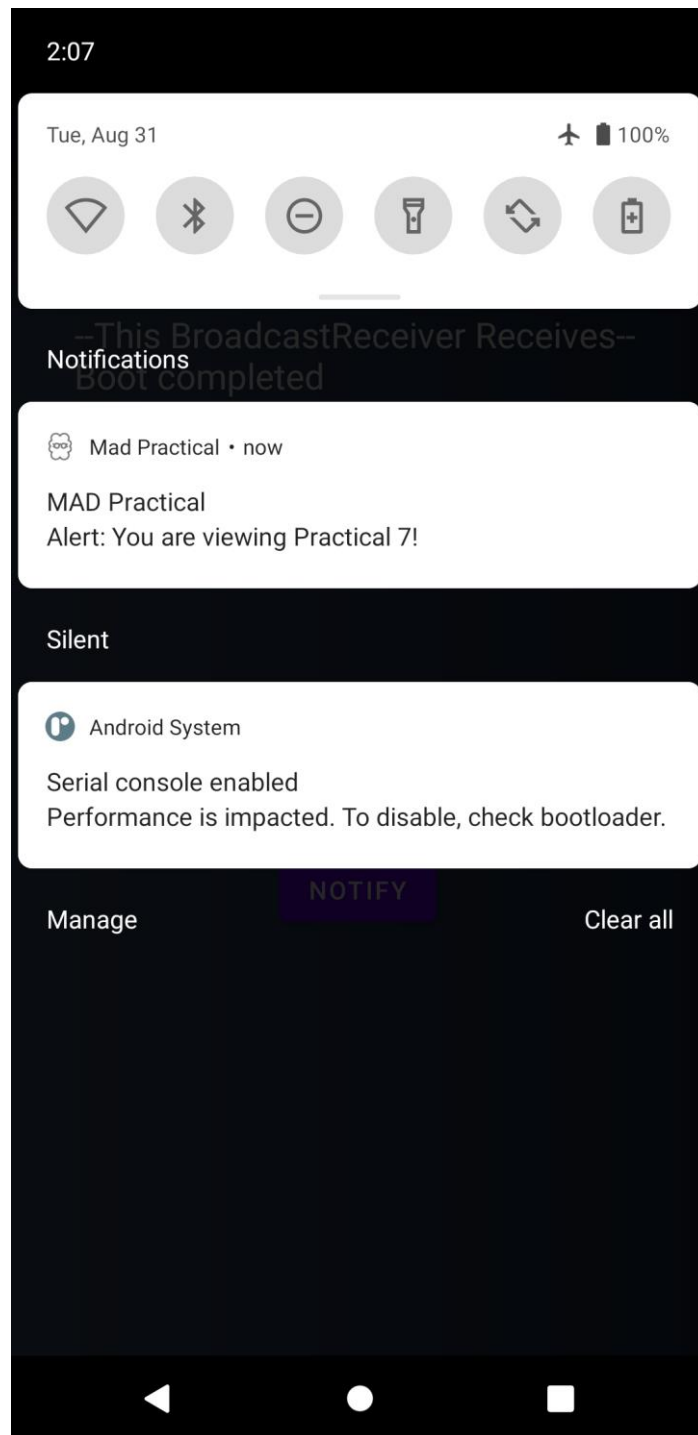
Fig7.3 - Notification

Practical – 8

AIM: Develop and Mobile Application for following topic
1. Make a use of android system like play audio, Video, Send SMS, Email.
2. Using location service get the current location
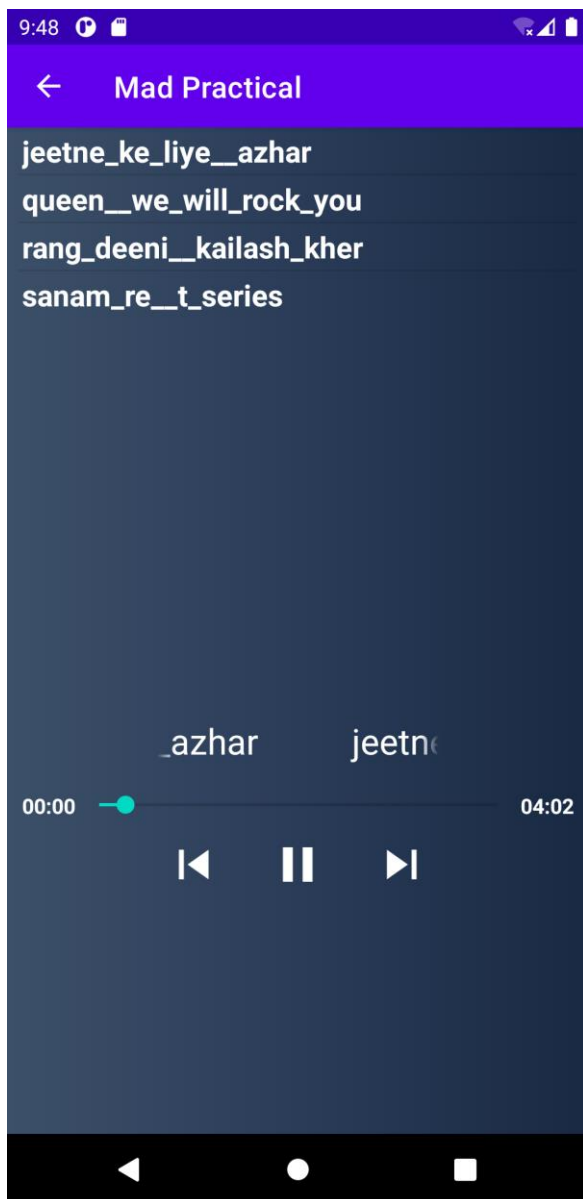3. Display the use of animations
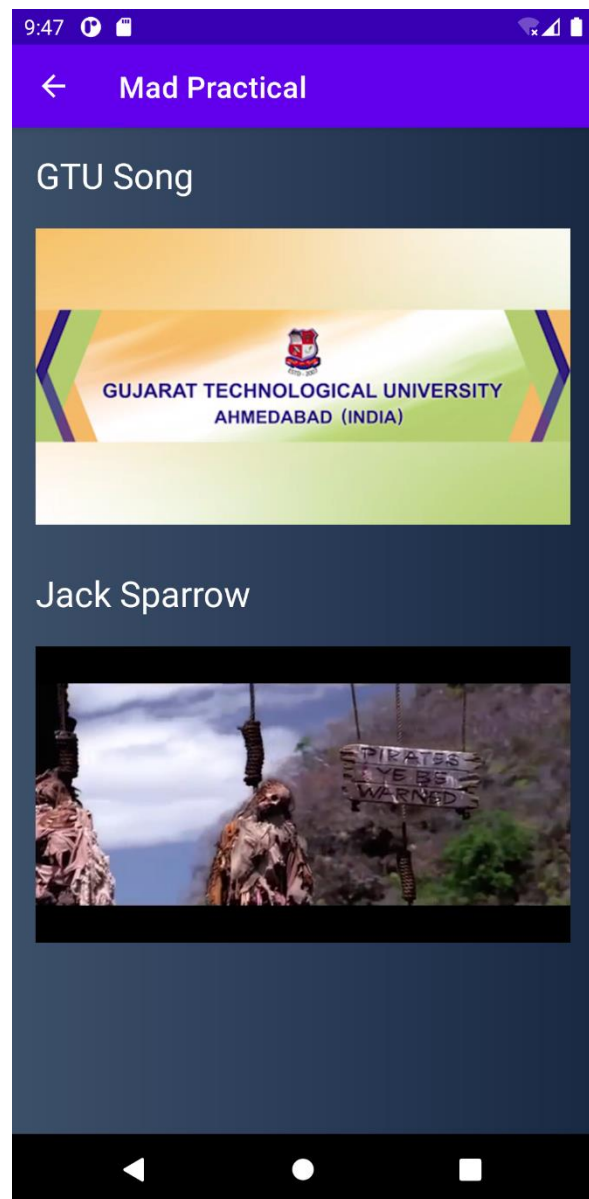

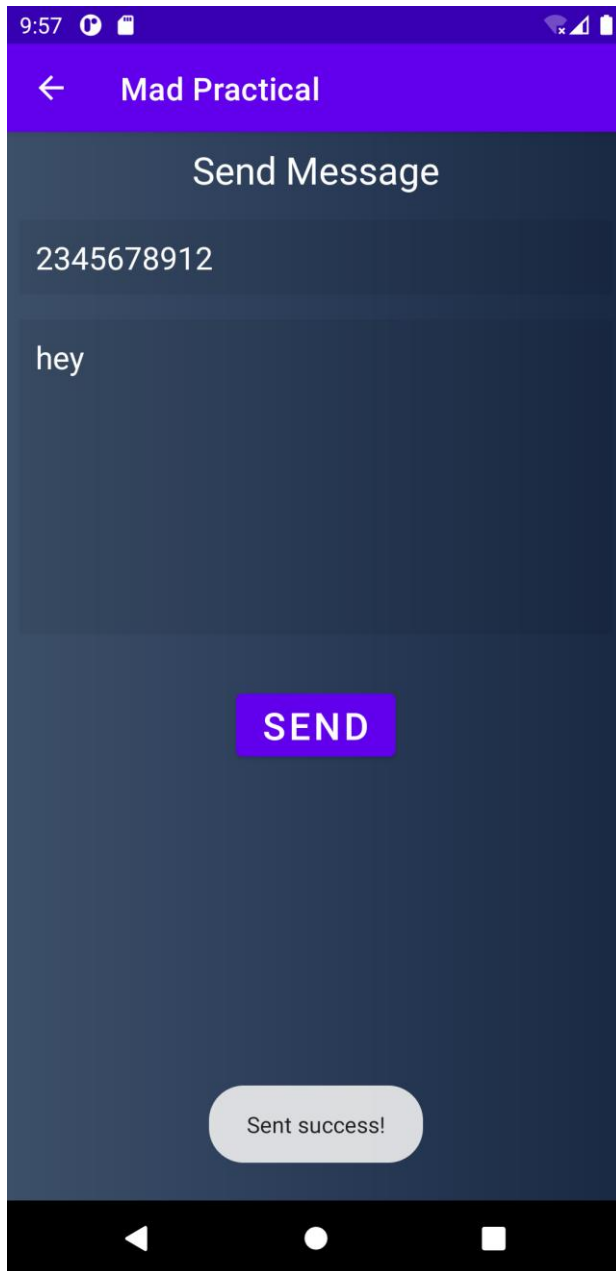Fig 8.1a Audio Player with controls

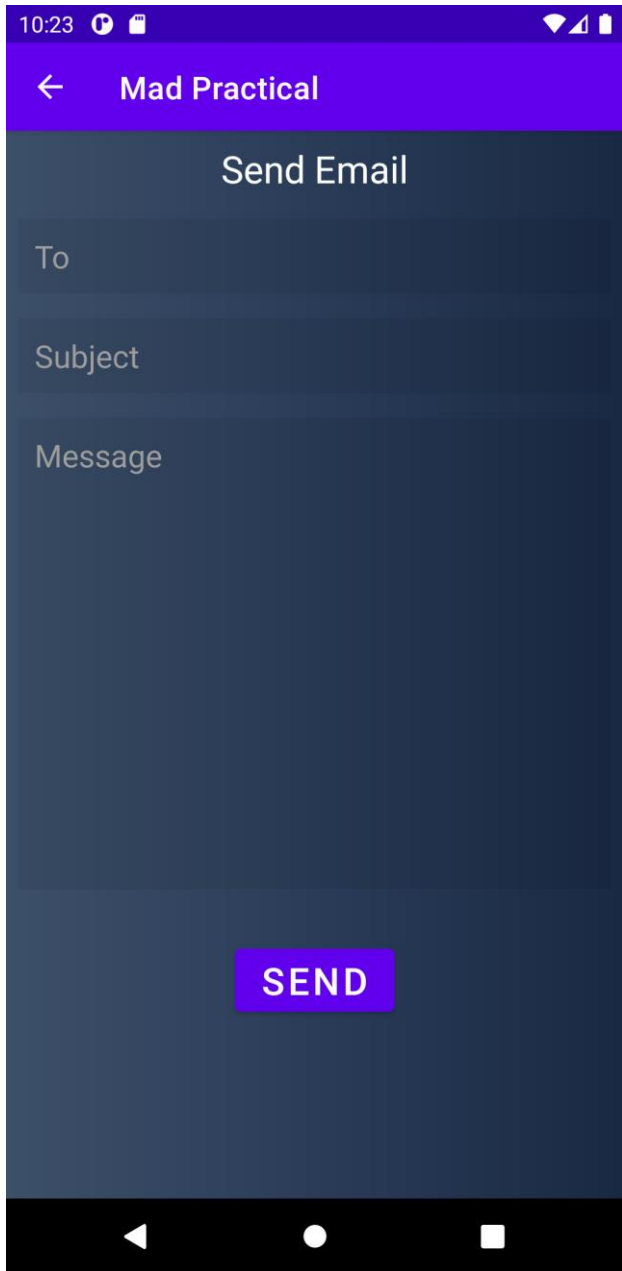Fig 8.1b Video Player with controls

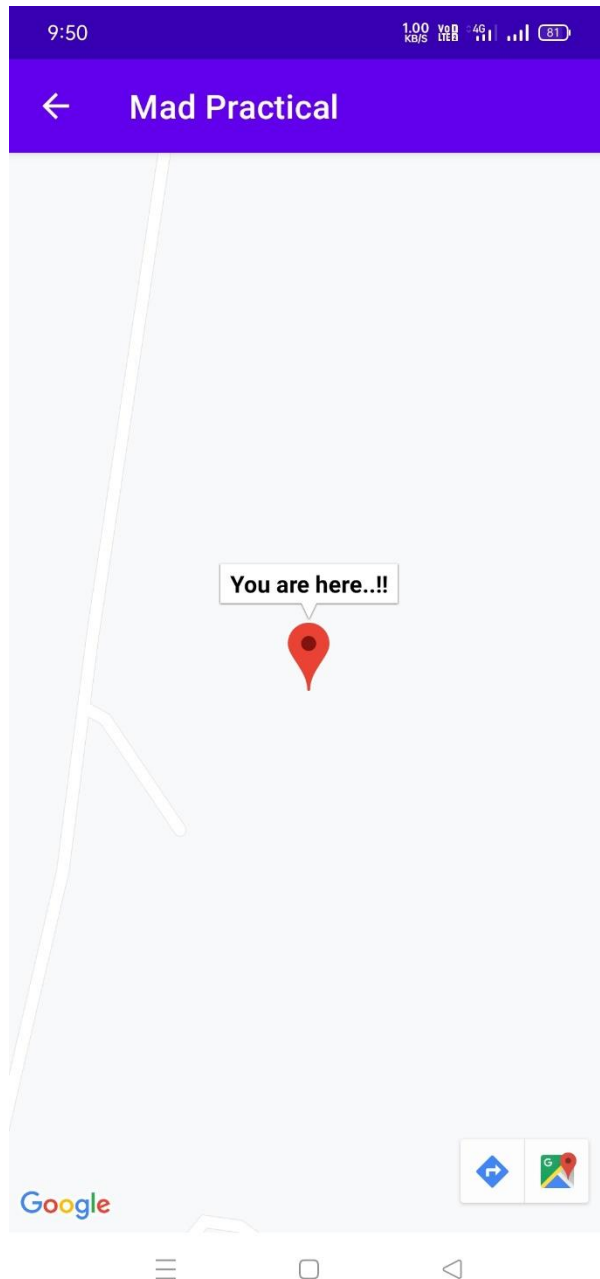Fig 8.1c Send SMS   Fig 8.1d Send Email (Gmail)

Fig 8.2 Get current location with zoom
Animation
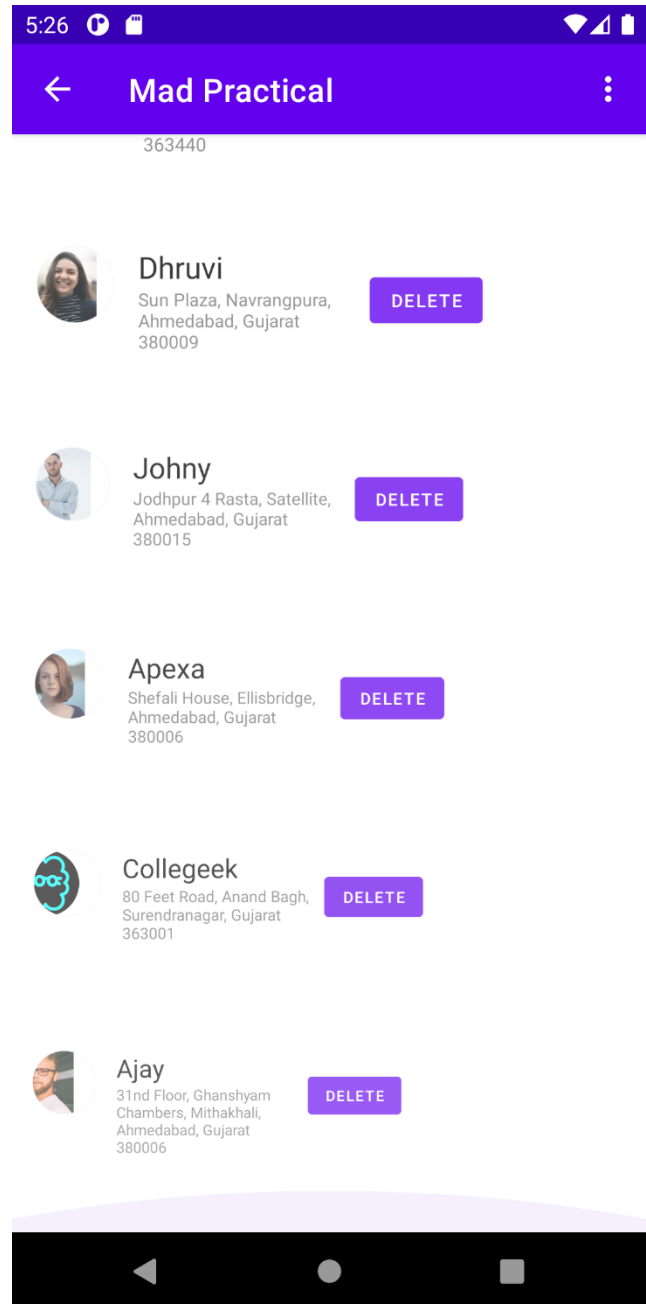
Fig 8.3 Scroll Animation

activity_play_audio.xml

```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"
    android:background="@drawable/gradient"
    tools:context=".Play_audio">

    <ListView
        android:id="@+id/song_list"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginLeft="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginRight="8dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

    </ListView>

    <LinearLayout
        android:id="@+id/scroll_text"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:gravity="center_horizontal"
        android:orientation="horizontal"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/song_list">

        <TextView
            android:id="@+id/scrollTxt"
            android:layout_width="200dp"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:ellipsize="marquee"
            android:focusable="true"
            android:focusableInTouchMode="true"
            android:freezesText="true"
            android:gravity="center"
            android:marqueeRepeatLimit="marquee_forever"
            android:paddingLeft="5dp"
            android:paddingRight="5dp"
            android:scrollHorizontally="true"
            android:singleLine="true"
```

```xml
            android:text="@string/blank"
            android:textColor="@color/white"
            android:textSize="24dp" />

    </LinearLayout>


    <LinearLayout
        android:id="@+id/linearLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:layout_marginTop="20dp"
        android:orientation="horizontal"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/scroll_text">

        <TextView
            android:id="@+id/player_position"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="00:00"
            android:textColor="@color/white"
            android:textStyle="bold" />

        <SeekBar
            android:id="@+id/seek_bar"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1" />

        <TextView
            android:id="@+id/player_duration"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="00:00"
            android:textColor="@color/white"
            android:textStyle="bold" />

    </LinearLayout>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:layout_marginTop="20dp"
        android:gravity="center_horizontal"
        android:orientation="horizontal"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/linearLayout">

        <ImageView
            android:id="@+id/prev"
            android:layout_width="60dp"
            android:layout_height="40dp"
```

```xml
        android:src="@drawable/ic_baseline_skip_previous_24" />

    <ImageView
        android:id="@+id/play"
        android:layout_width="60dp"
        android:layout_height="40dp"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:src="@drawable/ic_baseline_play_arrow_24" />

    <ImageView
        android:id="@+id/pause"
        android:layout_width="60dp"
        android:layout_height="40dp"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:src="@drawable/ic_baseline_pause_24"
        android:visibility="gone" />

    <ImageView
        android:id="@+id/next"
        android:layout_width="60dp"
        android:layout_height="40dp"
        android:src="@drawable/ic_baseline_skip_next_24" />

</LinearLayout>


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

Play_audio.java

```java
package com.example.madpractical;

import android.annotation.SuppressLint;
import android.media.MediaPlayer;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ImageView;
import android.widget.ListView;
import android.widget.SeekBar;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

import java.lang.reflect.Field;
import java.util.ArrayList;
import java.util.concurrent.TimeUnit;

public class Play_audio extends AppCompatActivity {

    ListView listView;
    ArrayList<String> arrayList;
    ArrayAdapter arrayAdapter;
```

```java
    MediaPlayer mediaPlayer;
    SeekBar seekBar;
    ImageView play, pause, next, prev;
    TextView playerPosition, playerDuration, scroll_text;

    Handler handler = new Handler();
    Runnable runnable;
    int Pid = -1;

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

        // Assign variable
        play = findViewById(R.id.play);
        pause = findViewById(R.id.pause);
        next = findViewById(R.id.next);
        prev = findViewById(R.id.prev);
        scroll_text = findViewById(R.id.scrollTxt);
        seekBar = findViewById(R.id.seek_bar);
        playerPosition = findViewById(R.id.player_position);
        playerDuration = findViewById(R.id.player_duration);
        listView = findViewById(R.id.song_list);
        arrayList = new ArrayList<>();

        // get song names
        Field[] fields = R.raw.class.getFields();
        // add name to list
        for (int i = 2; i < fields.length; ++i) {
            arrayList.add(fields[i].getName());
        }

        arrayAdapter = new ArrayAdapter(this, R.layout.simple_list,
arrayList);
        listView.setAdapter(arrayAdapter);

        // on click to song name
        listView.setOnItemClickListener(new AdapterView.OnItemClickListener()
{
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int
position, long id) {
                Pid = position;
                start_MediaPlayer(Pid);
                play.setVisibility(View.GONE);
                pause.setVisibility(View.VISIBLE);
            }
        });
        // on play
        play.setOnClickListener(v -> {
            if (Pid == -1) {
                Pid = 0;
                start_MediaPlayer(Pid);
            }
            play.setVisibility(View.GONE);
            pause.setVisibility(View.VISIBLE);
```

```java
            mediaPlayer.start();
        });
        // on pause
        pause.setOnClickListener(v -> {
            pause.setVisibility(View.GONE);
            play.setVisibility(View.VISIBLE);
            mediaPlayer.pause();
        });
        // on next
        next.setOnClickListener(v -> {
            if (Pid == -1) {
                Pid = 1;
                start_MediaPlayer(Pid);
            } else {
                Pid = Math.abs(Pid + 1) % arrayList.size();
                start_MediaPlayer(Pid);
            }
            play.setVisibility(View.GONE);
            pause.setVisibility(View.VISIBLE);
        });
        // on prev
        prev.setOnClickListener(v -> {
            if (Pid == -1) {
                Pid = arrayList.size() - 1;
                start_MediaPlayer(Pid);
            } else {
                Pid = (Pid - 1) > -1 ? (Pid - 1) : (arrayList.size() - 1);
                start_MediaPlayer(Pid);
            }
            play.setVisibility(View.GONE);
            pause.setVisibility(View.VISIBLE);
        });
    }

    // media player
    private void start_MediaPlayer(int position) {
        // free player
        if (mediaPlayer != null) mediaPlayer.release();
        // get id of song
        int Id = getResources().getIdentifier(arrayList.get(position), "raw",
getPackageName());
        // set Text
        scroll_text.setText(arrayList.get(position));
        scroll_text.setSelected(true);
        // Initialize media player
        mediaPlayer = MediaPlayer.create(Play_audio.this, Id);

        // Initialize runnable
        runnable = new Runnable() {
            @Override
            public void run() {
                // set progress on seek bar
                seekBar.setProgress(mediaPlayer.getCurrentPosition());
                // Handler post delay for 0.5 second
                handler.postDelayed(this, 500);
            }
        };
```

```java
        // Get duration of media player
        int duration = mediaPlayer.getDuration();
        // Convert millisecond to minute and second
        String Duration = convertFormat(duration);
        // set duration text
        playerDuration.setText(Duration);
        // Start media player
        mediaPlayer.start();
        // Set max on seek bar
        seekBar.setMax(mediaPlayer.getDuration());
        // control using seekbar
        seekBar.setOnSeekBarChangeListener(new
SeekBar.OnSeekBarChangeListener() {
            @Override
            public void onProgressChanged(SeekBar seekBar, int progress,
boolean fromUser) {
                if (fromUser) mediaPlayer.seekTo(progress);
            }

            @Override
            public void onStartTrackingTouch(SeekBar seekBar) {

            }

            @Override
            public void onStopTrackingTouch(SeekBar seekBar) {

            }
        });
        // Start handler
        handler.postDelayed(runnable, 0);
    }

    @SuppressLint("DefaultLocale")
    private String convertFormat(int duration) {
        return String.format("%02d:%02d",
                TimeUnit.MILLISECONDS.toMinutes(duration),
                TimeUnit.MILLISECONDS.toSeconds(duration) -

TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS.toMinutes(duration)));
    }
}
```

activity_playvideo.xml

```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"
    android:background="@drawable/gradient"
    android:padding="16dp"
    tools:context=".Playvideo">

    <ScrollView
```

```xml
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="GTU Song"
            android:textSize="24sp"
            android:textColor="@color/white"
            android:layout_marginBottom="20dp"/>
            <FrameLayout
                android:layout_width="match_parent"
                android:layout_height="200dp">

                <VideoView
                    android:id="@+id/video_view1"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content" />
            </FrameLayout>
            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Jack Sparrow"
                android:textSize="24sp"
                android:textColor="@color/white"
                android:layout_marginTop="30dp"
                android:layout_marginBottom="20dp"/>
            <FrameLayout
                android:layout_width="match_parent"
                android:layout_height="200dp">

                <VideoView
                    android:id="@+id/video_view2"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content" />
            </FrameLayout>
        </LinearLayout>
    </ScrollView>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Playvideo.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.MediaController;
import android.widget.VideoView;
```

```java
public class Playvideo extends AppCompatActivity {

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

        VideoView videoView1 = findViewById(R.id.video_view1);

videoView1.setVideoPath("android.resource://"+getPackageName()+"/"+R.raw.gtu_
song);
        MediaController mediaController1 = new MediaController(this);
        mediaController1.setAnchorView(videoView1);
        videoView1.setMediaController(mediaController1);

        VideoView videoView2 = findViewById(R.id.video_view2);

videoView2.setVideoPath("android.resource://"+getPackageName()+"/"+R.raw.jack
_sparrow);
        MediaController mediaController2 = new MediaController(this);
        mediaController2.setAnchorView(videoView2);
        videoView2.setMediaController(mediaController2);

    }
}
```

activity_send_message.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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"
    android:background="@drawable/gradient"
    android:orientation="vertical"
    tools:context=".Send_message">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_margin="8dp"
        android:text="Send Message"
        android:textColor="@color/white"
        android:textSize="24sp" />

    <EditText
        android:id="@+id/phone"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="8dp"
        android:background="#11000000"
        android:hint="Phone Number"
        android:importantForAutofill="no"
        android:inputType="phone"
        android:padding="10dp"
```

```xml
            android:textColor="#fff"
            android:textColorHint="#9e9e9e"
            android:textSize="20sp" />

        <EditText
            android:id="@+id/phone_message"
            android:layout_width="match_parent"
            android:layout_height="200dp"
            android:layout_margin="8dp"
            android:background="#11000000"
            android:gravity="top"
            android:hint="Type Message"
            android:importantForAutofill="no"
            android:inputType="textLongMessage"
            android:padding="10dp"
            android:textColor="#fff"
            android:textColorHint="#9e9e9e"
            android:textSize="20sp" />

        <Button
            android:id="@+id/send_btn"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center_horizontal"
            android:layout_margin="24dp"
            android:text="Send"
            android:textSize="24sp" />

</LinearLayout>
```

Send_message.java

```java
package com.example.madpractical;

import android.Manifest;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

public class Send_message extends AppCompatActivity {

    private EditText message, phone;
    private Button send_sms;

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

```java
        message = findViewById(R.id.phone_message);
        phone = findViewById(R.id.phone);
        send_sms = findViewById(R.id.send_btn);

        send_sms.setOnClickListener(v -> {

            if (ContextCompat.checkSelfPermission(Send_message.this,
Manifest.permission.SEND_SMS) == PackageManager.PERMISSION_GRANTED) {
                sendMessage();
            } else {
                ActivityCompat.requestPermissions(Send_message.this, new
String[]{Manifest.permission.SEND_SMS}, 100);
            }
        });

    }

    private void sendMessage() {
        String sms_text = message.getText().toString().trim();
        String phone_no = phone.getText().toString().trim();
        if (sms_text.isEmpty() || phone_no.isEmpty()) {
            Toast.makeText(Send_message.this, "All Fields required!",
Toast.LENGTH_LONG).show();
        } else {
            try {
                SmsManager smsManager = SmsManager.getDefault();
                smsManager.sendTextMessage(phone_no, null, sms_text, null,
null);
                Toast.makeText(Send_message.this, "Sent success!",
Toast.LENGTH_LONG).show();
            } catch (Exception e) {
                Toast.makeText(Send_message.this, "Error!",
Toast.LENGTH_LONG).show();
                Log.d("Sms Error", e.toString());
            }
        }
    }
}
```

activity_send_email.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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"
    android:background="@drawable/gradient"
    android:orientation="vertical"
    tools:context=".Send_email">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_margin="8dp"
        android:text="Send Email"
        android:textColor="@color/white"
```

```xml
        android:textSize="24sp" />

    <EditText
        android:id="@+id/email"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="8dp"
        android:background="#11000000"
        android:hint="To"
        android:importantForAutofill="no"
        android:inputType="textEmailAddress"
        android:padding="10dp"
        android:textColor="#fff"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/subject"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="8dp"
        android:background="#11000000"
        android:hint="Subject"
        android:importantForAutofill="no"
        android:inputType="text"
        android:padding="10dp"
        android:textColor="#fff"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/email_message"
        android:layout_width="match_parent"
        android:layout_height="300dp"
        android:layout_margin="8dp"
        android:background="#11000000"
        android:gravity="top"
        android:hint="Message"
        android:importantForAutofill="no"
        android:inputType="textLongMessage"
        android:padding="10dp"
        android:textColor="#fff"
        android:textColorHint="#9e9e9e"
        android:textSize="20sp" />

    <Button
        android:id="@+id/send_btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_margin="24dp"
        android:text="Send"
        android:textSize="24sp" />

</LinearLayout>
```

Send_email.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class Send_email extends AppCompatActivity {
    EditText email, subject, message;

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

        email = findViewById(R.id.email);
        subject = findViewById(R.id.subject);
        message = findViewById(R.id.email_message);
        Button send_sms = findViewById(R.id.send_btn);

        send_sms.setOnClickListener(v -> {
            String email_text = message.getText().toString().trim();
            String subject_text = subject.getText().toString().trim();
            String Email = email.getText().toString().trim();
            if (email_text.isEmpty() || subject_text.isEmpty() ||
Email.isEmpty()) {
                Toast.makeText(Send_email.this, "All Fields required!",
Toast.LENGTH_LONG).show();
            } else {
                try {
                    Intent intent = new Intent(Intent.ACTION_VIEW,
Uri.parse("mailto:" + Email));
                    intent.putExtra(Intent.EXTRA_SUBJECT, subject_text);
                    intent.putExtra(Intent.EXTRA_TEXT, email_text);
                    startActivity(intent);
                } catch (Exception e) {
                    Toast.makeText(Send_email.this, "Error!",
Toast.LENGTH_LONG).show();
                    Log.d("Sms Error", e.toString());
                }
            }
        });
    }

}
```

activity_practical8a.xml

```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=".Practical8a">

    <fragment
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/google_map"
        android:name="com.google.android.gms.maps.SupportMapFragment" />

</RelativeLayout>
```

Practical8a.java

```java
package com.example.madpractical;

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

import android.Manifest;
import android.content.SharedPreferences;
import android.content.pm.PackageManager;
import android.location.Location;
import android.os.Bundle;
import android.util.Log;

import com.google.android.gms.location.FusedLocationProviderClient;
import com.google.android.gms.location.LocationServices;
import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;
import com.google.android.gms.tasks.OnSuccessListener;
import com.google.android.gms.tasks.Task;
import com.karumi.dexter.Dexter;
import com.karumi.dexter.PermissionToken;
import com.karumi.dexter.listener.PermissionDeniedResponse;
import com.karumi.dexter.listener.PermissionGrantedResponse;
import com.karumi.dexter.listener.PermissionRequest;
import com.karumi.dexter.listener.single.PermissionListener;

public class Practical8a extends AppCompatActivity {

    SupportMapFragment mapFragment;
    FusedLocationProviderClient client;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

```java
        setContentView(R.layout.activity_practical8a);


        mapFragment = (SupportMapFragment)
getSupportFragmentManager().findFragmentById(R.id.google_map);
        client = LocationServices.getFusedLocationProviderClient(this);
        // get location permission using dexter library

Dexter.withContext(getApplicationContext()).withPermission(Manifest.permissio
n.ACCESS_FINE_LOCATION)
                .withListener(new PermissionListener() {
                    @Override
                    public void onPermissionGranted(PermissionGrantedResponse
permissionGrantedResponse) {
                        getLocation();
                    }

                    @Override
                    public void onPermissionDenied(PermissionDeniedResponse
permissionDeniedResponse) {

                    }

                    @Override
                    public void
onPermissionRationaleShouldBeShown(PermissionRequest permissionRequest,
PermissionToken permissionToken) {
                        // if user denied permission, ask again when user
uses service again
                        permissionToken.continuePermissionRequest();
                    }
                }).check();
    }

    public void getLocation() {
        if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED && ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
            // TODO: Consider calling
            //    ActivityCompat#requestPermissions
            // here to request the missing permissions, and then overriding
            //   public void onRequestPermissionsResult(int requestCode,
String[] permissions,
            //                                          int[] grantResults)
            // to handle the case where the user grants the permission. See
the documentation
            // for ActivityCompat#requestPermissions for more details.
            return;
        }
        Task<Location> task = client.getLastLocation();
        task.addOnSuccessListener(new OnSuccessListener<Location>() {
            @Override
            public void onSuccess(Location location) {
                mapFragment.getMapAsync(new OnMapReadyCallback() {
                    @Override
                    public void onMapReady(GoogleMap googleMap) {
```

```java
                            if (location != null) {
                                LatLng latLng = new
LatLng(location.getLatitude(), location.getLongitude());
                                //Log.d("location"," "+location.getLatitude());
                                MarkerOptions markerOptions = new
MarkerOptions().position(latLng).title("You are here..!!");

                                googleMap.addMarker(markerOptions);

googleMap.animateCamera(CameraUpdateFactory.newLatLngZoom(latLng, 17));//10
                                // save user details in SharedPreferences
                                SharedPreferences preferences =
getSharedPreferences("last_location_info", MODE_PRIVATE);
                                SharedPreferences.Editor editor =
preferences.edit();
                                editor.putLong("lat",
Double.doubleToRawLongBits(location.getLatitude()));
                                editor.putLong("long",
Double.doubleToRawLongBits(location.getLongitude()));
                                editor.putBoolean("check", true);
                                editor.apply();
                            } else {
                                // get data from preferences
                                SharedPreferences preferences =
getSharedPreferences("student_info", MODE_PRIVATE);
                                Boolean check = preferences.getBoolean("check",
false);

                                if (check == true) {
                                    LatLng latLng = new
LatLng(Double.longBitsToDouble(preferences.getLong("lat",
Double.doubleToLongBits(23))),
Double.longBitsToDouble(preferences.getLong("long",
Double.doubleToLongBits(23))));
                                    //Log.d("location","
"+location.getLatitude());
                                    MarkerOptions markerOptions = new
MarkerOptions().position(latLng).title("You are here..!!");

                                    googleMap.addMarker(markerOptions);

googleMap.animateCamera(CameraUpdateFactory.newLatLngZoom(latLng, 17));//10
                                }

                            }
                        }
                    });
                }
            });
        }
}
```

fade_scale.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<set xmlns:android="http://schemas.android.com/apk/res/android">
    <alpha
        android:duration="700"
        android:fromAlpha="0.0"
```

```xml
            android:toAlpha="1.0" />
    <scale
        android:duration="700"
        android:fillBefore="false"
        android:fromXScale="0.0"
        android:fromYScale="0.0"
        android:toXScale="1.0"
        android:toYScale="1.0" />
</set>
```

slide_in_row.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<set xmlns:android="http://schemas.android.com/apk/res/android">
    <alpha
        android:duration="500"
        android:fromAlpha="0.0"
        android:toAlpha="1.0" />
    <translate
        android:duration="700"
        android:fromXDelta="-100%"
        android:toXDelta="0%" />
</set>
```

Practical_2d.java

```java
package com.example.madpractical;

import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import android.os.Bundle;
import android.view.Menu;
import android.widget.LinearLayout;

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

public class Practical2d extends AppCompatActivity {

    RecyclerView recyclerView;
    LinearLayoutManager layoutManager;
    List<recyclerModel> studentList;
    Adapter adapter;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_practical3);

        initData();
        initRecyclerView();
    }

    private void initData() {
        studentList = new ArrayList<>();
```

```java
        studentList.add(new
recyclerModel(R.drawable.sid1,"Siddharth","Gundiyavada, Sayla, Surendranagar,
Gujarat, 363440"));
        studentList.add(new recyclerModel(R.drawable.img3,"Dhruvi","Sun
Plaza, Navrangpura, Ahmedabad, Gujarat 380009"));
        studentList.add(new recyclerModel(R.drawable.img2,"Johny","Jodhpur 4
Rasta, Satellite, Ahmedabad, Gujarat 380015"));
        studentList.add(new recyclerModel(R.drawable.img1,"Apexa","Shefali
House, Ellisbridge, Ahmedabad, Gujarat 380006"));
        studentList.add(new recyclerModel(R.drawable.co_512,"Collegeek","80
Feet Road, Anand Bagh, Surendranagar, Gujarat 363001"));
        studentList.add(new recyclerModel(R.drawable.img4,"Ajay","31nd Floor,
Ghanshyam Chambers, Mithakhali, Ahmedabad, Gujarat 380006"));

        // only for animation
        studentList.add(new
recyclerModel(R.drawable.sid1,"Siddharth","Gundiyavada, Sayla, Surendranagar,
Gujarat, 363440"));
        studentList.add(new recyclerModel(R.drawable.img3,"Dhruvi","Sun
Plaza, Navrangpura, Ahmedabad, Gujarat 380009"));
        studentList.add(new recyclerModel(R.drawable.img2,"Johny","Jodhpur 4
Rasta, Satellite, Ahmedabad, Gujarat 380015"));
        studentList.add(new recyclerModel(R.drawable.img1,"Apexa","Shefali
House, Ellisbridge, Ahmedabad, Gujarat 380006"));
        studentList.add(new recyclerModel(R.drawable.co_512,"Collegeek","80
Feet Road, Anand Bagh, Surendranagar, Gujarat 363001"));
        studentList.add(new recyclerModel(R.drawable.img4,"Ajay","31nd Floor,
Ghanshyam Chambers, Mithakhali, Ahmedabad, Gujarat 380006"));
        studentList.add(new
recyclerModel(R.drawable.sid1,"Siddharth","Gundiyavada, Sayla, Surendranagar,
Gujarat, 363440"));
        studentList.add(new recyclerModel(R.drawable.img3,"Dhruvi","Sun
Plaza, Navrangpura, Ahmedabad, Gujarat 380009"));
        studentList.add(new recyclerModel(R.drawable.img2,"Johny","Jodhpur 4
Rasta, Satellite, Ahmedabad, Gujarat 380015"));
        studentList.add(new recyclerModel(R.drawable.img1,"Apexa","Shefali
House, Ellisbridge, Ahmedabad, Gujarat 380006"));
        studentList.add(new recyclerModel(R.drawable.co_512,"Collegeek","80
Feet Road, Anand Bagh, Surendranagar, Gujarat 363001"));
        studentList.add(new recyclerModel(R.drawable.img4,"Ajay","31nd Floor,
Ghanshyam Chambers, Mithakhali, Ahmedabad, Gujarat 380006"));
        studentList.add(new
recyclerModel(R.drawable.sid1,"Siddharth","Gundiyavada, Sayla, Surendranagar,
Gujarat, 363440"));
        studentList.add(new recyclerModel(R.drawable.img3,"Dhruvi","Sun
Plaza, Navrangpura, Ahmedabad, Gujarat 380009"));
        studentList.add(new recyclerModel(R.drawable.img2,"Johny","Jodhpur 4
Rasta, Satellite, Ahmedabad, Gujarat 380015"));
        studentList.add(new recyclerModel(R.drawable.img1,"Apexa","Shefali
House, Ellisbridge, Ahmedabad, Gujarat 380006"));
        studentList.add(new recyclerModel(R.drawable.co_512,"Collegeek","80
Feet Road, Anand Bagh, Surendranagar, Gujarat 363001"));
        studentList.add(new recyclerModel(R.drawable.img4,"Ajay","31nd Floor,
Ghanshyam Chambers, Mithakhali, Ahmedabad, Gujarat 380006"));
    }

    private void initRecyclerView() {
```

```java
        recyclerView = (RecyclerView) findViewById(R.id.recyclerview);
        layoutManager = new LinearLayoutManager(this);
        layoutManager.setOrientation(RecyclerView.VERTICAL);
        recyclerView.setLayoutManager(layoutManager);
        adapter = new Adapter(studentList,getApplicationContext());
        recyclerView.setAdapter(adapter);
        adapter.notifyDataSetChanged();
    }

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

Adapter.java

```java
package com.example.madpractical;

import android.content.Context;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.TextView;

import androidx.annotation.NonNull;
import androidx.recyclerview.widget.RecyclerView;

import java.util.List;

public class Adapter extends RecyclerView.Adapter<Adapter.ViewHolder> {

    private List<recyclerModel> studentList;
    private Context context;
    public Adapter(List<recyclerModel> studentList,Context context){
        this.studentList = studentList;
        this.context = context;
    }

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

    @Override
    public void onBindViewHolder(@NonNull Adapter.ViewHolder holder, int
position) {
```

```java
        int imageview = studentList.get(position).getImageView();
        String name = studentList.get(position).getName();
        String address = studentList.get(position).getAddress();
        holder.delete.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                studentList.remove(position);
                notifyDataSetChanged();
            }
        });
        // for animation
        Animation animation =
AnimationUtils.loadAnimation(context,R.anim.slide_in_row);
        Animation animation_fade =
AnimationUtils.loadAnimation(context,R.anim.fade_scale);
        holder.imageView.startAnimation(animation);
        holder.itemView.startAnimation(animation_fade);
        // animation over

        holder.setData(imageview,name,address);
    }

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

    public class ViewHolder extends RecyclerView.ViewHolder{

        private ImageView imageView;
        private TextView name;
        private TextView address;
        private Button delete;


        public ViewHolder(@NonNull View itemView) {
            super(itemView);

            imageView = (ImageView)itemView.findViewById(R.id.imageView);
            name = itemView.findViewById(R.id.name);
            address = itemView.findViewById(R.id.address);
            delete = (Button) itemView.findViewById(R.id.delete);
        }

        public void setData(int imageview, String name, String address) {
            imageView.setImageResource(imageview);
            this.name.setText(name);
            this.address.setText(address);
        }
    }
}
```

Practical – 9

AIM: Develop a Mobile application for any topic (Mini Project).

ConvertO is developed by,

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Android Project ConvertO is PDF tool Project that enables you to edit, compress, merge, save PDF as well as extract images etc. our aim was to provide free pdf editor tool with ease of use.
Main Features:

- Add Watermark to PDF: add water mark with option of font size, font family, angle and color.
- PDFs Merge: merge multiple pdfs in single pdf.
- PDF Compression: compress pdf up to 34% of original size
- PDF invert: add dark mode in your pdf for ease of reading
- Images to PDF: everyone's favorite images to pdf
- Extract images from PDF: extract essential images from your pdf

Download APK file from here https://github.com/sidpro-hash/PDF-tools

Let's see some glimpse of ConvertO
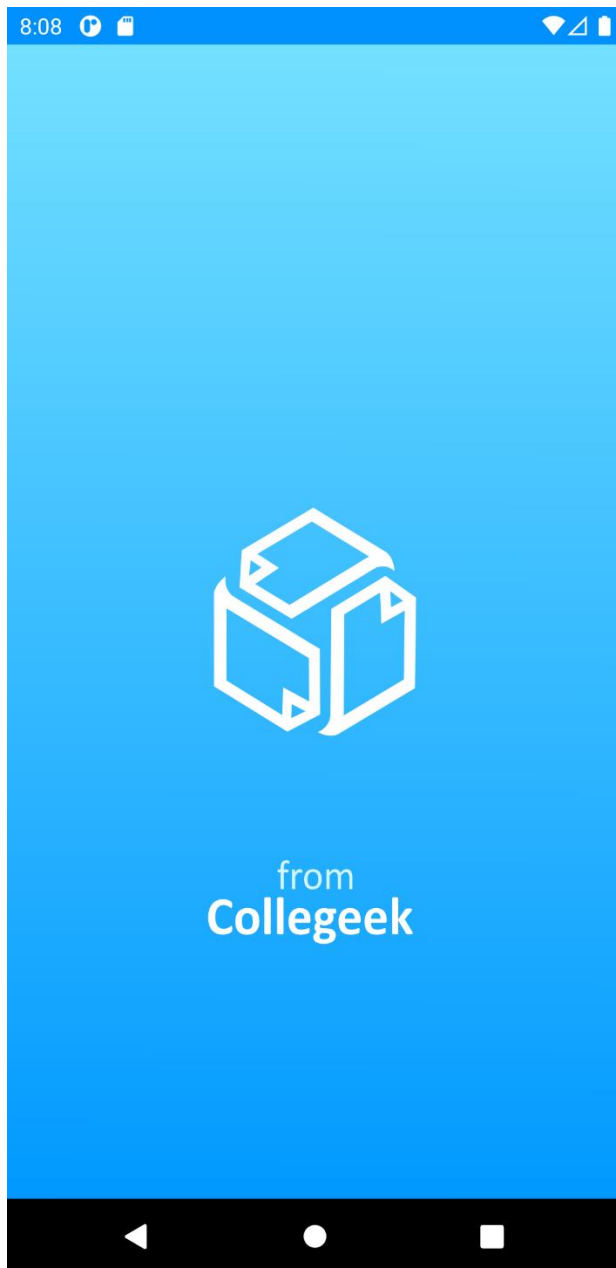
Fig 9.1 – splash screen   Fig 9.2 – All features
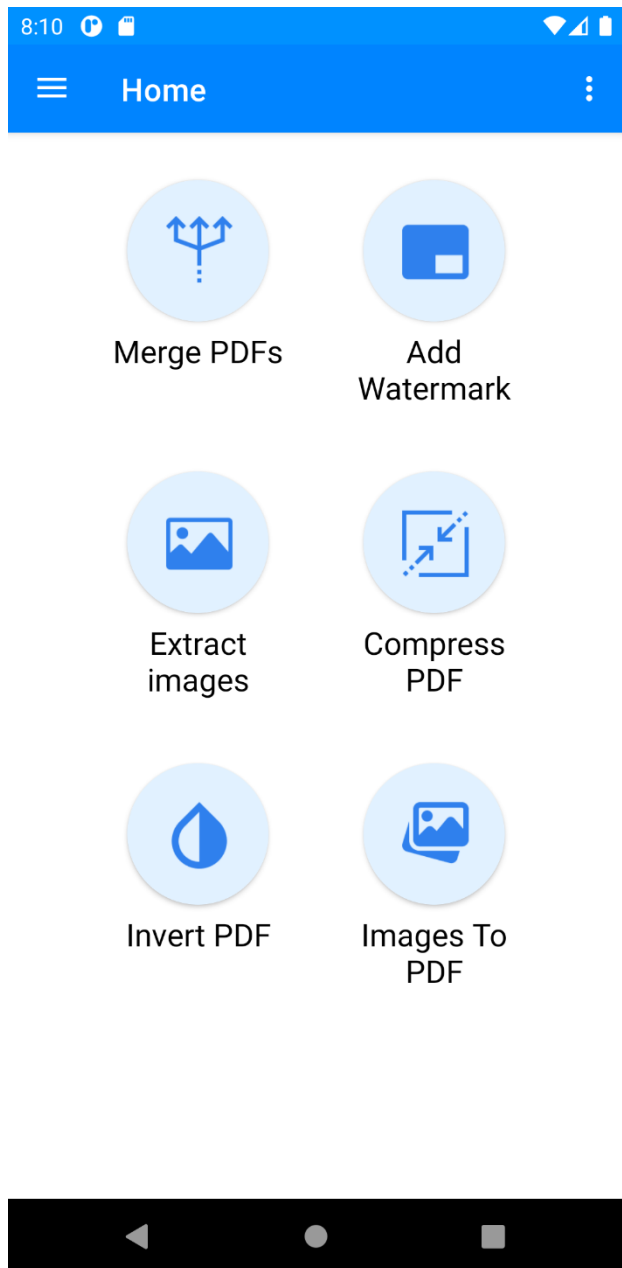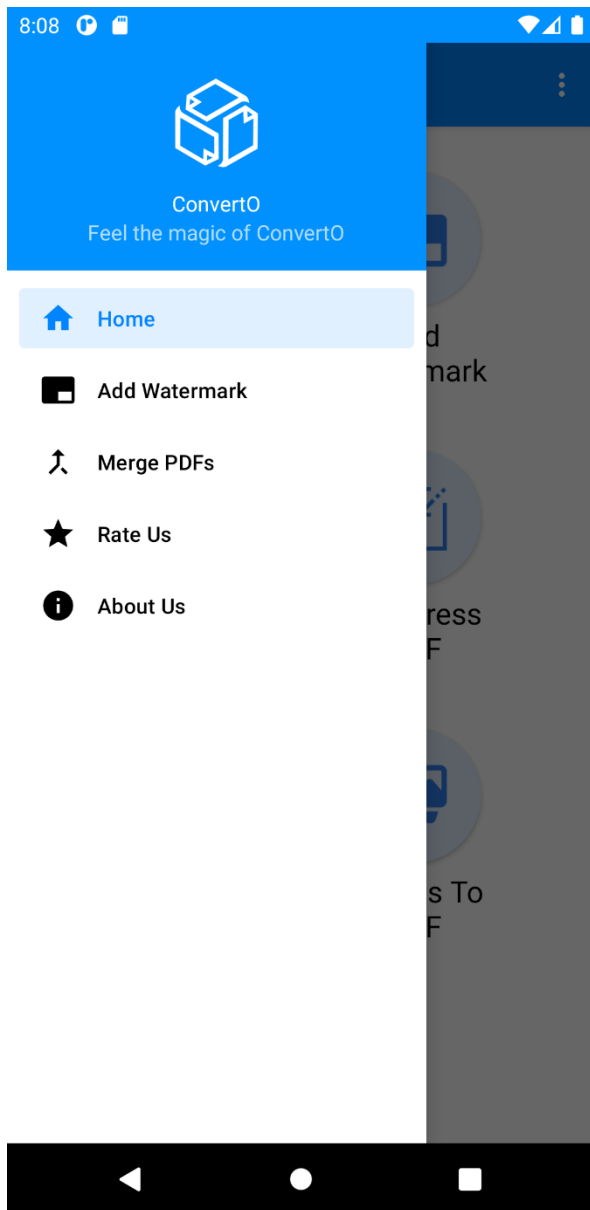
Fig 9.3 – side navigation

Fig 9.4 – Let's add watermark
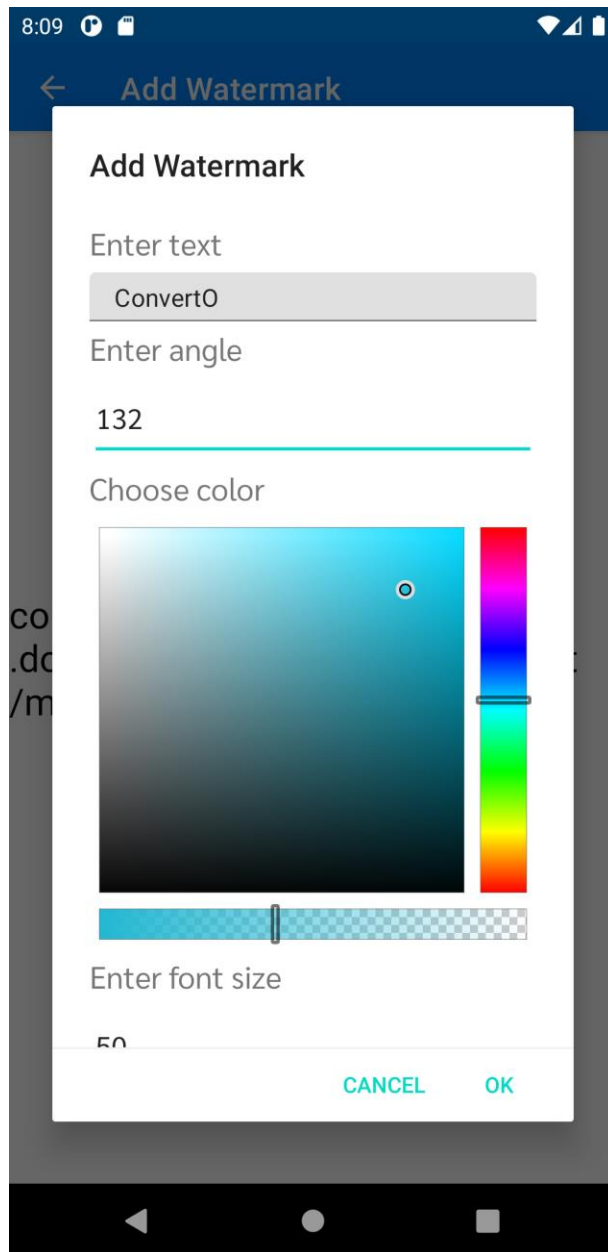
Fig 9.6 – Add watermark
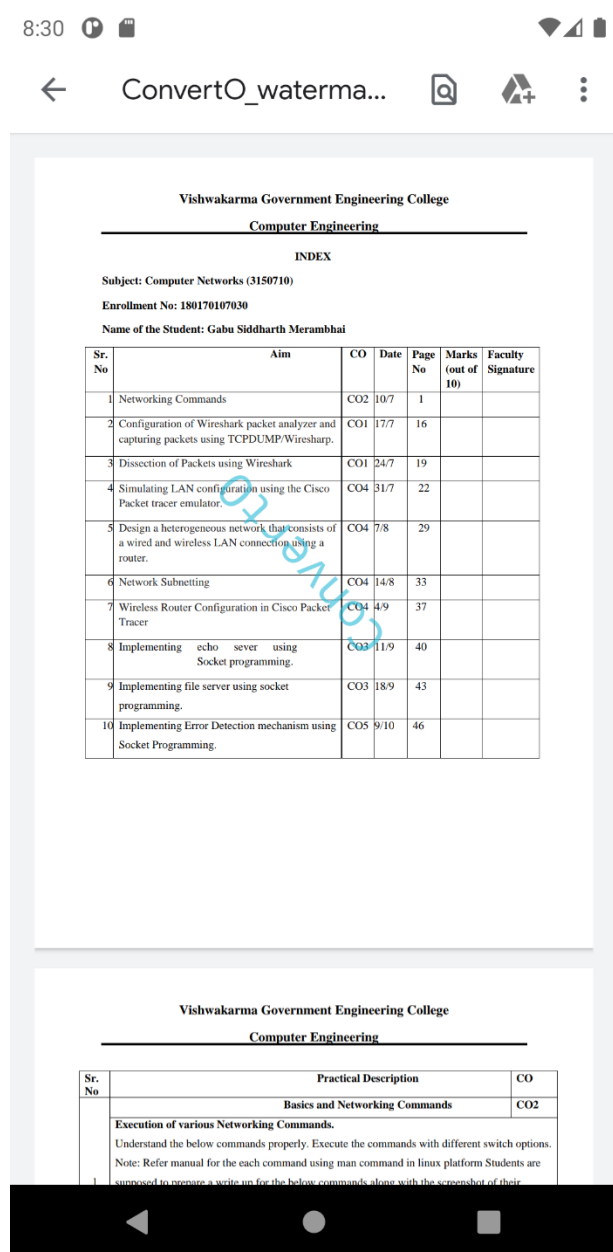
Fig 9.7 – Watermark add success
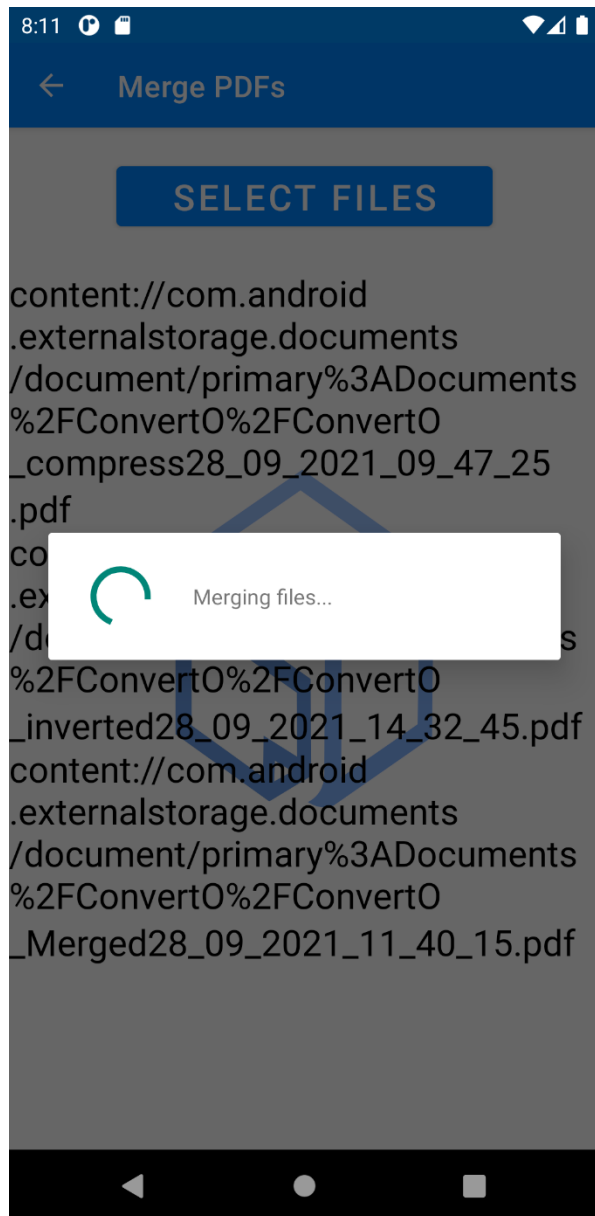
Fig 9.8 – Merging files
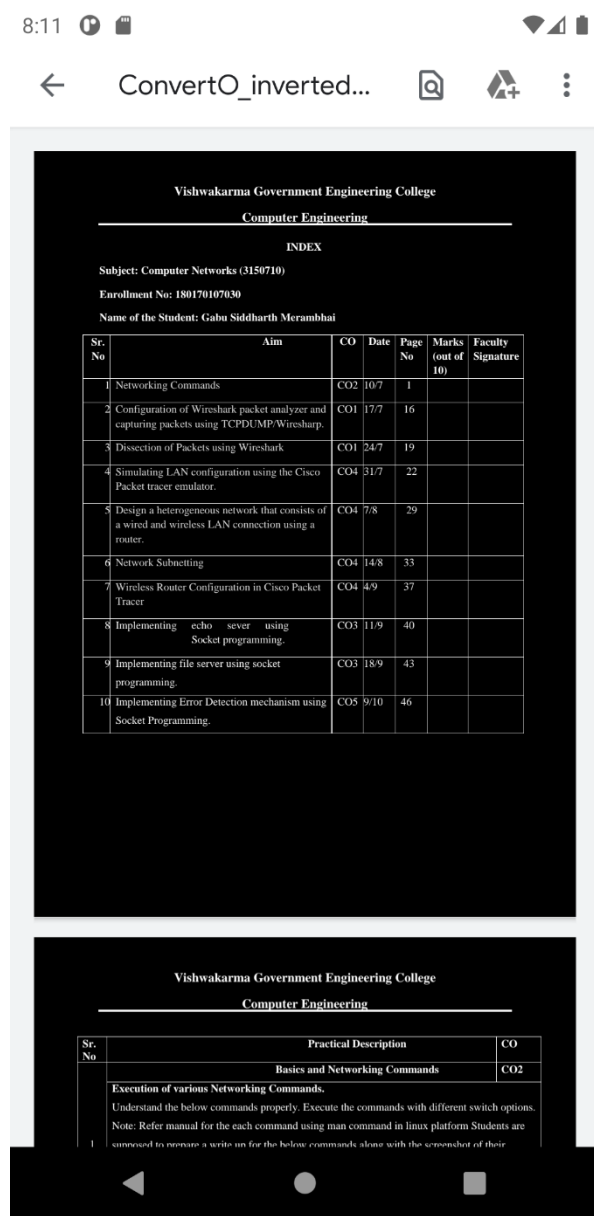
Fig 9.9 – inverted pdf

Practical – 10

AIM: Write Steps to generate an APK File of Mini Project and publish the Application.

Generate an APK

Step 1: Go to **Build → Generate Signed Bundle or APK.** Select APK.
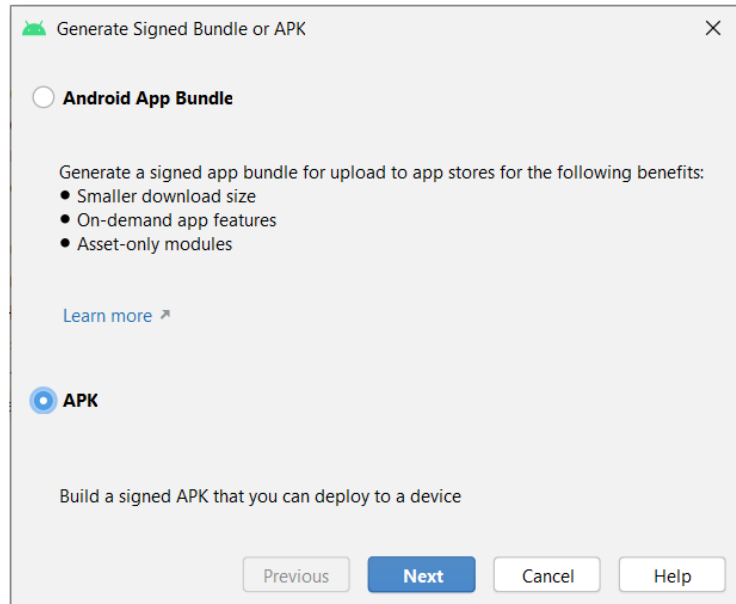
Fig 10.1 – Generate APK
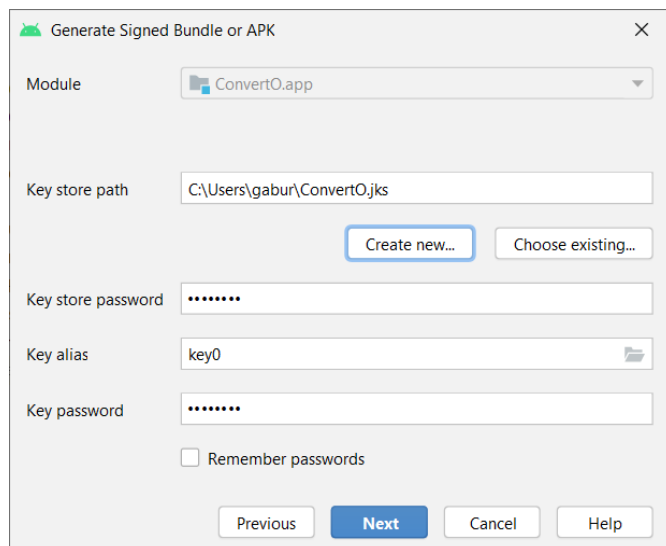
Fig 10.2 Click **Create New** key store
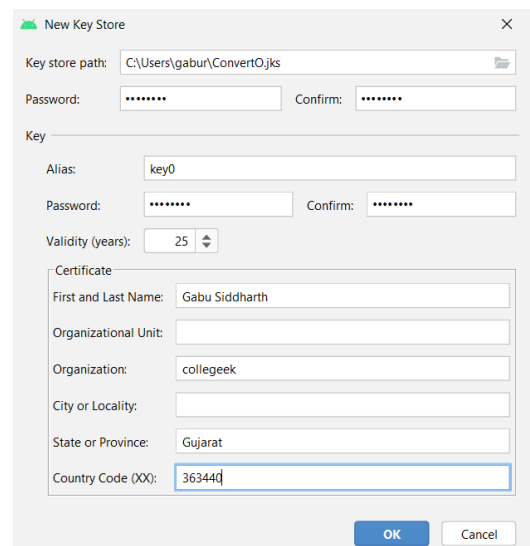
Fig 10.3 Create key store

Step 2: Create new release
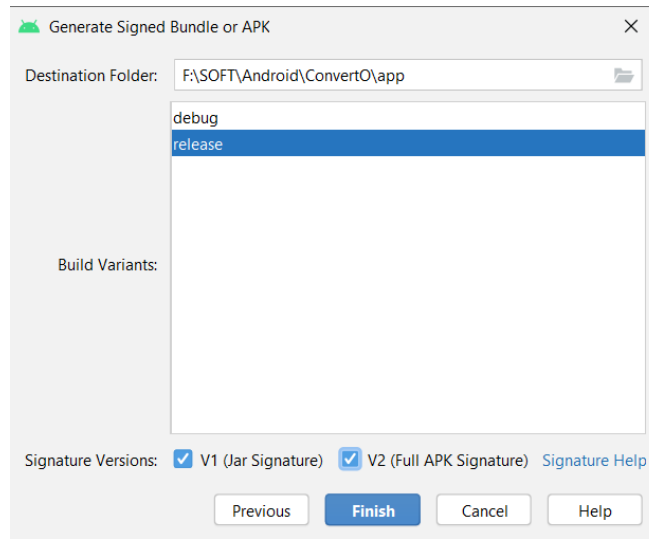
Fig 10.4 create release

Step 3: create new app on Google Play Console
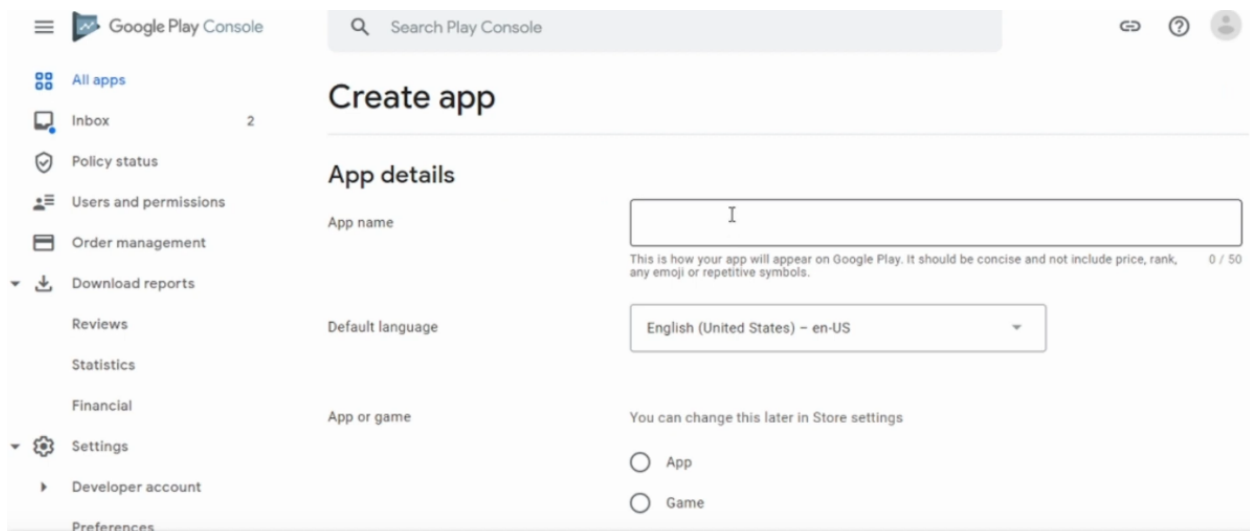
Fig 10.5 create new app on google play store

Step 4: fill every detail in set up your app
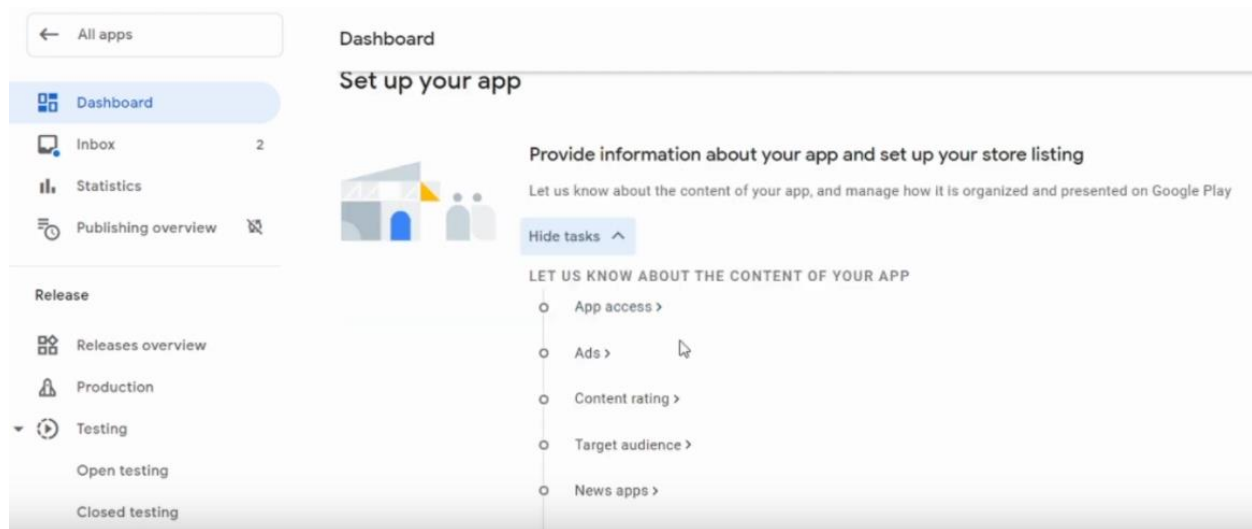
Fig 10.6 – set up app
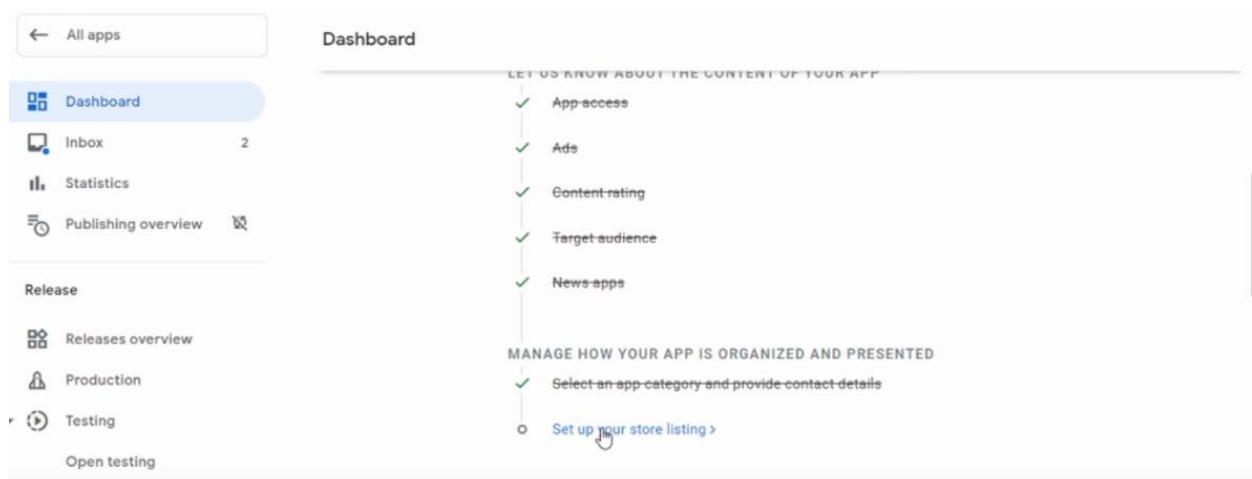
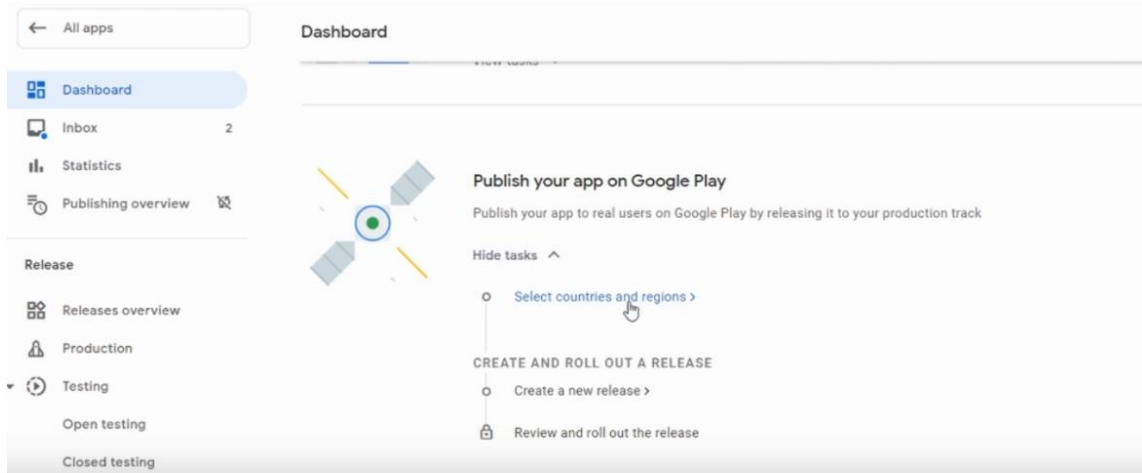Fig 10.7 – set up app

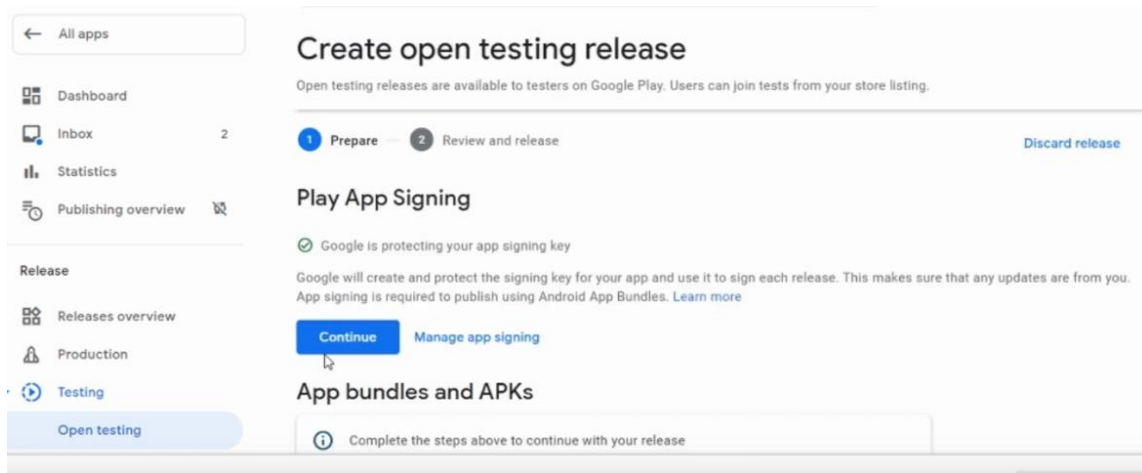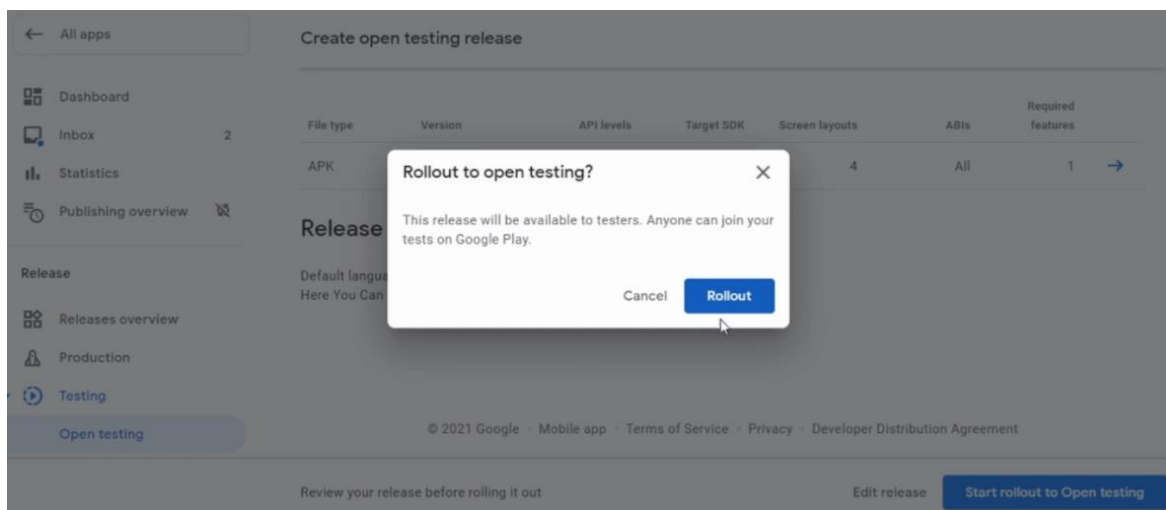Step 5: Publish app on google play

Fig 10.8 – publish app

Fig 10.9 – upload signed apk

Fig 10.10 – Finally Rollout app