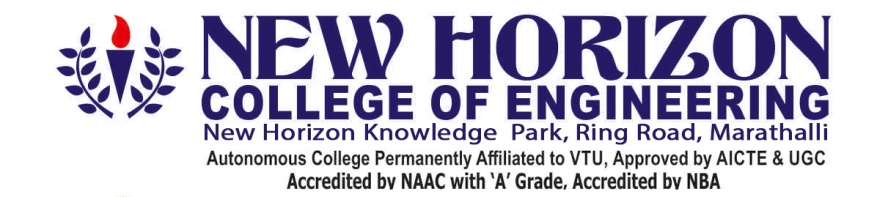
****

**Department of Computer Science & Engineering (Data Science)**

|  |
| --- |
| **Mobile Application Development Lab** |
| Course Code: 22CDS671 |
| Semester: VI AY: 2024-25 |

|  |  |  |
| --- | --- | --- |
| **Prepared By** | **Approved By** | **Authorized By** |
| **Swati Sehgal** | **Dr.B.Swathi** | **Dr.B.Swathi** |

**NEW HORIZON COLLEGE OF ENGINEERING VISION**

To emerge as an institute of eminence in the fields of engineering, technology and

management in serving the industry and the nation by empowering students with a high degree of technical, managerial and practical competence.

**MISSION**

To strengthen the theoretical, practical and ethical dimensions of the learning process by fostering a culture of research and innovation among faculty members and students.

To encourage long-term interaction between the academia and industry through their involvement in the design of curriculum and its hands-on implementation.

To strengthen and mould students in professional, ethical, social and environmental dimensions by encouraging participation in co-curricular and extracurricular activities

**QUALITY POLICY**

To provide educational services of the highest quality both curricular and co-curricular to enable students integrate skills and serve the industry and society equally well at global level.

**VALUES**

* Academic Freedom
* Integrity Inclusiveness
* Innovation
* Professionalism
* Social Responsibility

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (DATA SCIENCE) PROGRAM OUTCOMES (Pos)**

**PO1 Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex Computer Science and Data Science engineering problems.

**PO2 Problem Analysis:** Identify, formulate, review research literature and analyze complex Computer Science and Data Science engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

**PO3 Design / Development of Solutions:** Design solutions for complex Computer Science and Data Science engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

**PO4 Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions

**PO5 Modern tool usage:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex Computer Science and Data Science engineering act invitees with an understanding of the limitations.

**PO6 The engineer and society**: Apply reasoning informed by the contextual knowledge assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice in Computer Science and Data Science Engineering.

**PO7 Environment and sustainability:** Understand the impact of the professional engineering solutions in Computer Science and Data Science engineering in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9 Individual and Team Work:** Function effectively as an individual and as a member or leader to diverse teams, and in multidisciplinary settings.

**PO10 Communication:** Communicate effectively on complex Computer Science and Data Science engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective report and design documentation, make effective presentations, and give and receive clear instructions.

**PO11 Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12** Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAM SPECIFIC** **OUTCOMES (PSOs)**

**PSO1** Apply data analysis techniques, algorithmic expertise, and advanced modelling to effectively solve complex problems across various domains demonstrating their capacity to derive insights and propose innovative solutions in the realm of data-driven technologies.

**PSO2** Collaborate proficiently with experts from diverse fields and actively engage in continuous professional growth in the domain of Computer Science and Engineering, specializing in the field of Data Science.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MOBILE APPLICATION DEVELOPMENT** | | | | | | | | | | | | | | | | | | | | |
| **Course Code** | | **22CDS671** | | | | | | | | | **CIE Marks** | | | | | **50** | | | | |
| **L:T:P:S** | | **0:0:1:0** | | | | | | | | | **SEE Marks** | | | | | **50** | | | | |
| **Hrs / Week** | | **2** | | | | | | | | | **Total Marks** | | | | | **100** | | | | |
| **Credits** | | **1** | | | | | | | | | **Exam Hours** | | | | | **03** | | | | |
| **Course outcomes:** At the end of the course, the student will be able to: | | | | | | | | | | | | | | | | | | | | |
| 22CDS671.1 | | Develop single screen mobile applications by setting up Android development environment | | | | | | | | | | | | | | | | | | |
| 22CDS671.2 | | Use Intents & Services concepts in developing mobile applications. | | | | | | | | | | | | | | | | | | |
| 22CDS671.3 | | Implement mobile applications using files. | | | | | | | | | | | | | | | | | | |
| 22CDS671.4 | | Demonstrate methods of storing and retrieving data using Database | | | | | | | | | | | | | | | | | | |
| **Mapping of Course Outcomes to Program Outcomes and Program Specific Outcomes:** | | | | | | | | | | | | | | | | | | | | |
|  | **PO1** | | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | | **PO10** | **PO11** | **PO12** | | | **PSO1** | | **PSO2** |
| 22CDS671.1 | 3 | | 3 | 3 | 3 | 3 | - | - | - | - | | - | - | 2 | | | 3 | | 3 |
| 22CDS671.2 | 3 | | 3 | 3 | 3 | 3 | - | - | - | - | | - | - | 2 | | | 3 | | 3 |
| 22CDS671.3 | 3 | | 3 | 3 | 3 | 3 | - | - | - | - | | - | - | 2 | | | 3 | | 3 |
| 22CDS671.4 | 3 | | 3 | 3 | 3 | 3 | - | - | - | - | | - | - | 2 | | | 3 | | 3 |
|  | | | | | | | | | | | | | | | | | | | | |
| **Pgm. No.** | **List of Programs** | | | | | | | | | | | | | | **Hours** | | | **COs** | | |
| **Prerequisite Programs** | | | | | | | | | | | | | | | | | | | | |
|  | * Basics of Programming | | | | | | | | | | | | | |  | | | NA | | |
| **PART-A** | | | | | | | | | | | | | | | | | | | | |
| 1 | Develop an Android application that displays information about a small business. Your design must include: Business name Photo of business Contact information and Description of Business | | | | | | | | | | | | | | 2 | | | 22CDS661.1 | | |
| 2 | Develop an Android application to design a Visiting card. The visiting card should have a company logo at the top right corner. The company name should be displayed in capital letters, aligned to the center. Information like Name of the employee, Designation, Phone number, Address, Email, and the Website address is to be displayed | | | | | | | | | | | | | | 2 | | | 22CDS661.1 | | |
| 3 | Develop an Android application using Button, TextView and Edit Text for designing a Calculator having basic functionality like Addition, Subtraction, Multiplication and Division. | | | | | | | | | | | | | | 2 | | | 22CDS661.1 | | |
| 4 | Develop an Android application The Easy Unit Converter using Radio Buttons | | | | | | | | | | | | | | 2 | | | 22CDS661.1 | | |
| 5 | Develop an Android application Currency Converter using Spinners | | | | | | | | | | | | | | 2 | | | 22CDS661.1 | | |
| 6 | Develop an Android application using Explicit intent to display the login page. On giving the wrong credentials it should display the toast message and if credentials are correct it should display Welcome and the username | | | | | | | | | | | | | | 2 | | | 22CDS661.1 | | |
| **PART-B** | | | | | | | | | | | | | | | | | | | | |
| 7 | Develop an Android application using Implicit intent to display the Gallery and Call buttons. On clicking these buttons, it should goto the respective pages | | | | | | | | | | | | | | 2 | | | 22CDS661.2 | | |
| 8 | Develop an Android application Tourist spot with three activities : Welcome page, Display attractions of tourist spot and Webpage of the tourist spot | | | | | | | | | | | | | | 2 | | | 22CDS661.2 | | |

|  |  |  |  |
| --- | --- | --- | --- |
| 9 | Develop an Android application to play music in background | 2 | 22CDS661.2 |
| 10 | Develop an Android Audio Recording Application. | 2 | 22CDS661.3 |
| 11 | Develop an Android application The Expense Manager using Android. The application should store all the expenses in a file | 2 | 22CDS661.3 |
| 12 | Develop an Android application Student Database App using Android. The app should store USN, Student name and Semester of student in SQLite database | 2 | 22CDS661.4 |
| **PART-C**  **Beyond Syllabus Virtual Lab Content**  **(To be done during Lab but not to be included for CIE or SEE)**   1. Develop an Android application Health Monitoring App using Android. The app should store Name, Age, blood pressure, blood group and glucose level of patient in SQLite database 2. Develop an Android application to display Map of your college locality 3. Develop an Android application to alert SMS to one given phone number | | | |
| **CIE Assessment Pattern (50 Marks – Lab)**   |  |  |  |  | | --- | --- | --- | --- | | **RBT Levels** | | **Test (s)** | **Weekly Assessment** | | **20** | **30** | | **L1** | **Remember** | **-** | **-** | | **L2** | **Understand** | - | - | | **L3** | **Apply** | **10** | 10 | | **L4** | **Analyze** | **5** | 10 | | **L5** | **Evaluate** | **5** | 10 | | **L6** | **Create** | - | - | | | | |
| **SEE Assessment Pattern (50 Marks – Lab)**   |  |  |  | | --- | --- | --- | | **RBT Levels** | | **Exam Marks Distribution (50)** | | **L1** | **Remember** | **-** | | **L2** | **Understand** | **-** | | **L3** | **Apply** | **20** | | **L4** | **Analyze** | **20** | | **L5** | **Evaluate** | **10** | | **L6** | **Create** | **-** | | | | |
| **Suggested Learning Resources:**  Text Books:   1. Reto Meier; Professional Android 4 Application Development; Wiley India Pvt.ltd; 1st Edition; 2012; ISBN-13: 9788126525898. 2. Phillips, Stewart, Hardy and Marsicano; Android Programming, 2nd edition - Big Nerd Ranch Guide;2015; ISBN-13 978-0134171494.   Reference Books:   * 1. Mark Murphy; Beginning Android 3; Apress Springer India Pvt Ltd. ;1st Edition; 2011;ISBN-13: 978- 1- 4302- 3297-1   2. Eric Hellman; Android Programming – Pushing the limits by Hellman; Wiley; 2013; ISBN 13: 978- 1118717370   3. [www.developer.android](http://www.developer.android/) | | | |

|  |  |  |
| --- | --- | --- |
| **S.No** | **List of Experiments** | **Page No** |
| 1 | Develop an Android application that displays information about a small business. Your design must include:   * Business name, * Photo of business, * Contact information * Description of Business. | **8** |
| 2 | Develop an Android application to design a Visiting card. The visiting card should have a company logo at the top right corner. The company name should be displayed in capital letters, aligned to the center. Information like Name of the employee, Designation, Phone number, Address, Email, and the Website address is to be displayed | **11** |
| 3 | Develop an Android application using Button, TextView and Edit Text for designing a Calculator having basic functionality like Addition, Subtraction, Multiplication and Division. | **16** |
| 4 | Develop an Android application The Easy Unit Converter using Radio Buttons | **20** |
| 5 | Develop an Android application Currency Converter using Spinners | **24** |
| 6 | Develop an Android application using Explicit intent to display the login page. On giving the wrong credentials it should display the toast message and if credentials are correct it should display Welcome and the username | **28** |
| 7 | Develop an Android application using Implicit intent to display the Gallery and Call buttons. On clicking these buttons, it should goto the respective pages | **35** |
| 8 | Develop an Android application Tourist spot with three activities : Welcome page, Display attractions of tourist spot and Webpage of the tourist spot | **37** |
| 9 | Develop an Android application to play music in background | **40** |
| 10 | Develop an Android Audio Recording Application | **43** |
| 11 | Develop an Android application The Expense Manager using Android. The application should store all the expenses in a file | **48** |
| 12 | Develop an Android application Student Database App using Android. The app should store USN, Student name and Semester of student in SQLite database | **53** |

**1.Develop an Android application that displays information about a small business. Your design must include: Business name Photo of business Contact information and Description of Business**.

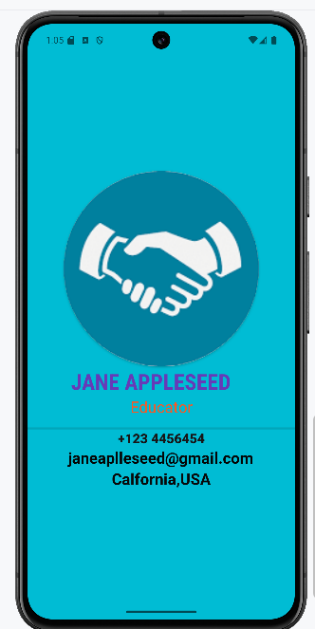
**XML FILE**

*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:background="#00BCD4"  
 android:gravity="center"  
 android:orientation="vertical"  
 tools:context=".MainActivity">  
  
 <androidx.cardview.widget.CardView  
 android:layout\_width="300dp"  
 android:layout\_height="300dp"  
 android:background="#03A9F4"  
 android:backgroundTint="#CDDC39"  
 app:cardCornerRadius="150dp">  
  
 <ImageView  
 android:id="@+id/imageView5"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:background="#00BCD4"  
 android:scaleType="centerCrop"  
 app:srcCompat="@drawable/images"  
 tools:ignore="ContentDescription,ImageContrastCheck" />  
  
 </androidx.cardview.widget.CardView>  
  
 <TextView  
 android:id="@+id/textView2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginEnd="16dp"  
 android:fontFamily="sans-serif-condensed"  
 android:text="JANE APPLESEED"  
 android:textAlignment="center"  
 android:textColor="#673AB7"  
 android:textSize="34sp"  
 android:textStyle="bold"  
 tools:ignore="HardcodedText,TextContrastCheck,VisualLintBounds" />  
  
 <TextView  
 android:id="@+id/textView3"  
 android:layout\_width="match\_parent"  
 android:layout\_height="48dp"  
 android:text="Educator"  
 android:textAlignment="center"  
 android:textColor="#FF5722"  
 android:textSize="24sp"  
 tools:ignore="HardcodedText,TextContrastCheck" />  
  
 <View  
 android:id="@+id/divider"  
 android:layout\_width="match\_parent"  
 android:layout\_height="3dp"  
 android:background="?android:attr/listDivider"  
 android:backgroundTint="#070909"  
 android:visibility="visible" />  
  
 <TextView  
 android:id="@+id/textView4"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:fontFamily="sans-serif-black"  
 android:text="+123 4456454"  
 android:textAlignment="center"  
 android:textAllCaps="true"  
 android:textColor="#F2190D0D"  
 android:textSize="20sp"  
 android:textStyle="bold"  
 tools:ignore="HardcodedText" />  
  
 <TextView  
 android:id="@+id/textView5"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:fontFamily="sans-serif"  
 android:text="janeaplleseed@gmail.com"  
 android:textAlignment="center"  
 android:textColor="#050505"  
 android:textSize="24sp"  
 android:textStyle="bold"  
 tools:ignore="HardcodedText" />  
  
 <TextView  
 android:id="@+id/textView6"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Calfornia,USA"  
 android:textAlignment="center"  
 android:textColor="#090909"  
 android:textSize="24sp"  
 android:textStyle="bold"  
 tools:ignore="HardcodedText" />  
  
</LinearLayout>

**JAVA FILE**

package com.example.bussinesscard;  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
 }  
}

**OUTPUT-BUSINESS CARD**



**2.Develop an Android application to design a Visiting card. The visiting card should have a company logo at the top right corner. The company name should be displayed in capital letters, aligned to the center. Information like Name of the employee, Designation, Phone number, Address, Email, and the Website address is to be displayed.**

**XML FILE**

<?xml version="1.0" encoding="utf-8"?>  
 <RelativeLayoutxmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="horizontal"  
 android:textAlignment="center"  
 tools:context=".MainActivity">  
  
   
 <ImageView  
 android:id="@+id/imageView"  
 android:layout\_width="123dp"  
 android:layout\_height="119dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginTop="17dp"  
 android:layout\_marginEnd="10dp"  
 android:layout\_marginBottom="613dp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="1.0"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.0"  
 app:srcCompat="@drawable/logo2"  
 tools:ignore="ContentDescription,VisualLintBounds" />  
  
 <TextView  
 android:id="@+id/textView1"  
 android:layout\_width="227dp"  
 android:layout\_height="148dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginStart="10dp"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginEnd="154dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_marginBottom="602dp"  
 android:background="#AAE4B0F8"  
 android:fontFamily="sans-serif-black"  
 android:padding="10dp"  
 android:text="LOTUSFLOWERWORKS"  
 android:textAlignment="center"  
 android:textAllCaps="true"  
 android:textColor="#9C27B0"  
 android:textSize="30sp"  
 android:textStyle="italic"  
 android:visibility="visible"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.219"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.049"  
 tools:ignore="HardcodedText,TextSizeCheck,VisualLintBounds,VisualLintOverlap" />  
  
 <View  
 android:id="@+id/divider"  
 android:layout\_width="match\_parent"  
 android:layout\_height="2dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginTop="24dp"  
 android:layout\_marginEnd="-2dp"  
 android:layout\_marginBottom="563dp"  
 android:background="#9C27B0"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.0"  
 tools:ignore="VisualLintBounds"  
 tools:visibility="visible" />  
  
 <TextView  
 android:id="@+id/tvname"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="135dp"  
 android:layout\_marginRight="135dp"  
 android:layout\_marginBottom="492dp"  
 android:text="@string/name\_karidas"  
 android:textColor="#9C27B0"  
 android:textSize="24sp"  
 tools:ignore="MissingConstraints,RelativeOverlap,RtlHardcoded,TextSizeCheck,VisualLintOverlap" />

<TextView  
android:id="@+id/tvjob"  
 android:layout\_width="match\_parent"  
 android:layout\_height="40dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="-4dp"  
 android:layout\_marginBottom="418dp"  
 android:padding="2dp"  
 android:text="@string/job\_title\_salesman"  
 android:textAlignment="center"  
 android:textAllCaps="true"  
 android:textColor="#9C27B0"  
 android:textDirection="firstStrongRtl"  
 android:textSize="24sp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 tools:ignore="MissingConstraints,TextSizeCheck,VisualLintBounds" />  
  
 <TextView  
 android:id="@+id/tvadrees"  
 android:layout\_width="match\_parent"  
 android:layout\_height="40dp"  
 android:layout\_alignParentEnd="false"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="1dp"  
 android:layout\_marginBottom="340dp"  
 android:padding="2dp"  
 android:text="@string/address\_belagavi\_karnataka"  
 android:textAlignment="center"  
 android:textAllCaps="true"  
 android:textColor="#9C27B0"  
 android:textDirection="firstStrongLtr"  
 android:textSize="20sp"  
 app:layout\_constraintBottom\_toBottomOf="@id/tvEmail"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="@id/tvjob"  
 app:layout\_constraintTop\_toTopOf="@id/tvjob"  
 tools:ignore="TextSizeCheck,VisualLintOverlap" />  
  
 <TextView  
 android:id="@+id/tvWebsite"  
 android:layout\_width="match\_parent"  
 android:layout\_height="57dp"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginBottom="250dp"  
 android:padding="2dp"  
 android:text="www.lotusflowerworks.com"  
 android:textAlignment="center"  
 android:textColor="#9C27B0"  
 android:textSize="24sp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.0"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.768"  
 tools:ignore="HardcodedText,TextSizeCheck,VisualLintOverlap" />  
  
 <TextView  
 android:id="@+id/tvMobileNumber"  
 android:layout\_width="227dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="89dp"  
 android:layout\_marginBottom="188dp"  
 android:text="789451213"  
 android:textAlignment="center"  
 android:textColor="#9C27B0"  
 android:textSize="24sp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 tools:ignore="HardcodedText,MissingConstraints,TextSizeCheck" />  
  
 <TextView  
 android:id="@+id/tvEmail"  
 android:layout\_width="match\_parent"  
 android:layout\_height="39dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="-6dp"  
 android:layout\_marginBottom="108dp"  
 android:padding="2dp"  
 android:text="Email\_abc@gmail.com"  
 android:textAlignment="center"  
 android:textColor="#9C27B0"  
 android:textSize="24sp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 tools:ignore="HardcodedText,TextSizeCheck,VisualLintBounds" />  
  
</RelativeLayout>

**JAVA FILE**

package com.example.visitingcard;  
  
import android.os.Bundle;  
  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.enable(this);  
 setContentView(R.layout.activity\_main);  
 ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
 }  
}

**OUTPUT:**

****

**3.Develop an Android application using Button, TextView and Edit Text for designing a Calculator having basic functionality like Addition, Subtraction, Multiplication and Division**.

**XML FILE**

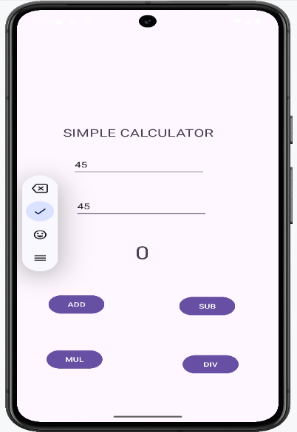
<RelativeLayoutxmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="102dp"  
 android:layout\_marginBottom="626dp"  
 android:text="SIMPLE CALCULATOR"  
 android:textSize="24sp"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.498"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.042"  
 tools:ignore="SpUsage" />  
  
 <EditText  
 android:id="@+id/editText1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="115dp"  
 android:layout\_marginBottom="547dp"  
 android:ems="10"  
 android:hint="Enter the First Number"  
 android:inputType="textPersonName"  
 android:minHeight="48dp"  
 android:text=""  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill" />  
  
 <EditText  
 android:id="@+id/editText2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="111dp"  
 android:layout\_marginBottom="455dp"  
 android:ems="10"  
 android:hint="@string/enter\_the\_second\_number"  
 android:inputType="textPersonName"  
 android:minHeight="48dp"  
 android:text=""  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill" />  
  
 <TextView  
 android:id="@+id/textView1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="203dp"  
 android:layout\_marginBottom="350dp"  
 android:text="0"  
 android:textSize="40sp"  
 tools:ignore="HardcodedText" />  
 <Button  
 android:id="@+id/button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="274dp"  
 android:layout\_marginBottom="237dp"  
 android:onClick="doAdd"  
 android:text="ADD" />  
 <Button  
 android:id="@+id/button2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="68dp"  
 android:layout\_marginBottom="233dp"  
 android:onClick="doSub"  
 android:text="SUB" />  
 <Button  
 android:id="@+id/button3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="277dp"  
 android:layout\_marginBottom="115dp"  
 android:onClick="doMul"  
 android:text="MUL" />  
 <Button  
 android:id="@+id/button4"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="63dp"  
 android:layout\_marginBottom="104dp"  
 android:onClick="doDiv"  
 android:text="DIV" />  
</RelativeLayout>

**JAVA FILE**

package com.example.calculator1;

import android.annotation.SuppressLint;  
import androidx.appcompat.app.AppCompatActivity;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.EditText;  
import android.widget.TextView;  
public class MainActivity extends AppCompatActivity {  
 EditText e1,e2;  
 TextView tv1;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 e1 = findViewById(R.id.*editText1*);  
 e2 = findViewById(R.id.*editText2*);  
 tv1 = findViewById(R.id.*textView1*);  
 }  
 @SuppressLint("SetTextI18n")  
 public void doAdd(View V){  
 int a1 = Integer.*parseInt*(e1.getText().toString());  
 int a2 = Integer.*parseInt*(e2.getText().toString());  
 int result= a1+a2;  
 tv1.setText(""+result);  
 }  
 @SuppressLint("SetTextI18n")  
 public void doSub(View V){  
 int a1 = Integer.*parseInt*(e1.getText().toString());  
 int a2 = Integer.*parseInt*(e2.getText().toString());  
 int result= a1-a2;  
 tv1.setText(""+result);  
 }  
 @SuppressLint("SetTextI18n")  
 public void doMul(View V){  
 int a1 = Integer.*parseInt*(e1.getText().toString());  
 int a2 = Integer.*parseInt*(e2.getText().toString());  
 int result= a1\*a2;  
 tv1.setText(""+result);  
 }   
 @SuppressLint("SetTextI18n")   
 public void doDiv(View V){   
 int a1 = Integer.*parseInt*(e1.getText().toString());  
 int a2 = Integer.*parseInt*(e2.getText().toString());  
 float result= (float) a1 /a2;  
 tv1.setText(""+result);   
 }  
}

**OUTPUT**



**4.Develop an Android application The Easy Unit Converter using Radio Buttons**

**XML FILE**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:background="#03A9F4"  
 android:orientation="vertical"  
 android:padding="16dp"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/textView"  
 android:layout\_width="383dp"  
 android:layout\_height="85dp"  
 android:background="#673AB7"  
 android:text="UNIT CONVERTER"  
 android:textAlignment="center"  
 android:textSize="34sp" />  
  
 <EditText  
 android:id="@+id/inputValue"  
 android:layout\_width="378dp"  
 android:layout\_height="91dp"  
 android:hint="Enter value"  
 android:inputType="numberDecimal"  
 tools:ignore="Autofill,VisualLintTextFieldSize" />  
  
 <RadioGroup  
 android:id="@+id/radioGroup"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical">  
  
 <RadioButton  
 android:id="@+id/kmToM"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Km to M"  
 android:textColor="@color/radio\_button\_color"  
 android:textSize="16sp" />  
  
 <RadioButton  
 android:id="@+id/mToKm"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="M to Km"  
 android:textColor="@color/radio\_button\_color"  
 android:textSize="16sp" />  
  
 <RadioButton  
 android:id="@+id/cmToM"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Cm to M"  
 android:textColor="@color/radio\_button\_color"  
 android:textSize="16sp" />  
  
 <RadioButton  
 android:id="@+id/mToCm"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="M to Cm"  
 android:textColor="@color/radio\_button\_color"  
 android:textSize="16sp"  
 tools:ignore="TextContrastCheck" />  
  
 <Button  
 android:id="@+id/convertButton"  
 android:layout\_width="264dp"  
 android:layout\_height="wrap\_content"  
 android:insetLeft="4dp"  
 android:insetRight="4dp"  
 android:text="Convert"  
 android:textAlignment="center" />  
  
 <TextView  
 android:id="@+id/resultView"  
 android:layout\_width="387dp"  
 android:layout\_height="61dp"  
 android:layout\_marginTop="16dp"  
 android:background="#F4ECA8"  
 android:textSize="18sp"  
 tools:ignore="VisualLintBounds" />  
 </RadioGroup>  
</LinearLayout>

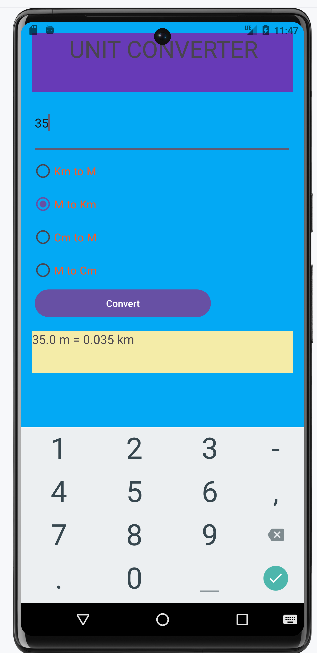
**STRING.XML**

<resources>  
 <string name="app\_name">Interconvertibilities</string>  
 <string name="hint\_enter\_value">Enter value</string>  
 <string name="radio\_km\_to\_m">Km to M</string>  
 <string name="radio\_m\_to\_km">M to Km</string>  
 <string name="radio\_cm\_to\_m">Cm to M</string>  
 <string name="radio\_m\_to\_cm">M to Cm</string>  
 <string name="button\_convert">Convert</string>  
 <string name="error\_enter\_value">Please enter a value.</string>  
 <string name="error\_select\_conversion">Please select a conversion type.</string>  
</resources>

**JAVA FILE**

package com.example.distanceunitconverter;   
import android.annotation.SuppressLint;  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.RadioButton;  
import android.widget.RadioGroup;  
import android.widget.TextView;  
  
public class MainActivity extends AppCompatActivity {  
 EditText inputValue;  
 RadioGroup radioGroup;  
 RadioButton kmToM;  
 RadioButton mToKm;  
 RadioButton cmToM;  
 RadioButton MToCm;  
 Button convertButton;  
 TextView resultView;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 inputValue = findViewById(R.id.*inputValue*);  
 radioGroup = findViewById(R.id.*radioGroup*);  
 kmToM = findViewById(R.id.*kmToM*);  
 mToKm = findViewById(R.id.*mToKm*);  
 MToCm = findViewById(R.id.*mToCm*);  
 cmToM = findViewById(R.id.*cmToM*);  
 convertButton =findViewById(R.id.*convertButton*);  
 resultView =findViewById(R.id.*resultView*);  
 convertButton.setOnClickListener(v -> convert());  
 }  
 @SuppressLint("SetTextI18n")  
 private void convert() {  
 String input = inputValue.getText().toString();  
 if (input.isEmpty()) {  
 resultView.setText("Please enter a value ");  return;  
 }  
  
 double value = Double.*parseDouble*(input);  
 double result;  
  
 if (kmToM.isChecked()) {  
 result = value \* 1000;  
 resultView.setText(value + " km = " + result + " m");  
 } else if (mToKm.isChecked()) {  
 result = value / 1000;  
 resultView.setText(value + " m = " + result + " km");  
  
 }else if (cmToM.isChecked()){  
 result = value /100 ;  
 resultView .setText(value + "cm = " + result + "m ");  
 } else if (MToCm.isChecked()) {  
 result = value \* 100 ;  
 resultView.setText(value + "m = " + result + "cm ");  
 }else {  
 resultView.setText("Please select a conversion type.");  
 }  
 }}

**OUTPUT**



**5.Develop an android application for currency convertor using Spinner** .

String.XML

<resources>  
 <string name="app\_name">CurrencyConverter</string>  
 <string name="currency\_converter">Currency Converter</string>  
 <string name="enter\_amount">Enter Amount</string>  
  
 <string name="converted\_amount">Converted Amount: %1$s %2$s</string>  
</resources>

**Create a Material Design UI with:**

* TextInputLayout for amount entry
* Spinner for selecting currencies
* MaterialButton for conversion
* CardView for displaying results

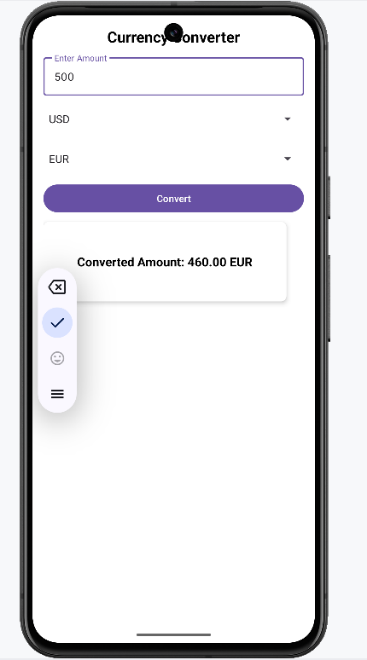
**XML FILE**

<?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"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 android:orientation="vertical"  
 android:padding="16dp"  
 android:background="@color/white">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/currency\_converter"  
 android:textSize="22sp"  
 android:textStyle="bold"  
 android:textColor="@color/black"  
 android:layout\_gravity="center"  
 android:paddingBottom="10dp"/>  
  
 <com.google.android.material.textfield.TextInputLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/enter\_amount">  
  
 <com.google.android.material.textfield.TextInputEditText  
 android:id="@+id/editAmount"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:inputType="numberDecimal"  
 tools:ignore="VisualLintTextFieldSize,SpeakableTextPresentCheck,TouchTargetSizeCheck" />  
 </com.google.android.material.textfield.TextInputLayout>  
  
 <Spinner  
 android:id="@+id/spinnerFrom"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="10dp"  
 android:minHeight="48dp" />  
  
 <Spinner  
 android:id="@+id/spinnerTo"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="10dp"  
 android:minHeight="48dp" />  
  
 <com.google.android.material.button.MaterialButton  
 android:id="@+id/btnConvert"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Convert"  
 android:layout\_marginTop="10dp"  
 tools:ignore="HardcodedText,VisualLintButtonSize" />  
  
 <androidx.cardview.widget.CardView  
 android:layout\_width="354dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="10dp"  
 app:cardCornerRadius="8dp"  
 app:cardElevation="4dp"  
 tools:ignore="TextSizeCheck">  
  
 <TextView  
 android:id="@+id/textResult"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_margin="30dp"  
 android:padding="16dp"  
 android:text="@string/converted\_amount"  
 android:textAlignment="center"  
 android:textColor="@color/black"  
 android:textSize="18sp"  
 android:textStyle="bold" />  
 </androidx.cardview.widget.CardView>  
  
</LinearLayout>

**2.MainActivity.java to: ✔️ Initialize UI components  
✔️ Use hardcoded exchange rates  
✔️ Convert currency based on selection**

**JAVA FILE**

package com.example.currencyconverter;  
  
import android.os.Bundle;  
import android.widget.ArrayAdapter;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.Spinner;  
import android.widget.TextView;  
import android.widget.Toast;  
import androidx.appcompat.app.AppCompatActivity;  
import java.util.HashMap;  
import java.util.Locale;  
import java.util.Map;  
  
public class MainActivity extends AppCompatActivity {  
  
 private Spinner spinnerFrom, spinnerTo;  
 private EditText editAmount;  
 private TextView textResult;  
  
 // Hardcoded exchange rates (Base: USD)  
 private final Map<String, Double> exchangeRates = new HashMap<>();  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.activity\_main);  
  
 // Initialize Views  
 spinnerFrom = findViewById(R.id.spinnerFrom);  
 spinnerTo = findViewById(R.id.spinnerTo);  
 editAmount = findViewById(R.id.editAmount);  
 textResult = findViewById(R.id.textResult);  
 Button btnConvert = findViewById(R.id.btnConvert);  
  
 // Initialize Exchange Rates  
 setupExchangeRates();  
  
 // Set up Spinners with Currency Options  
 String[] currencies = {"USD", "EUR", "GBP", "INR", "JPY"};  
 ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.simple\_spinner\_dropdown\_item, currencies);  
 spinnerFrom.setAdapter(adapter);  
 spinnerTo.setAdapter(adapter);  
  
 // Handle Convert Button Click  
 btnConvert.setOnClickListener(v -> convertCurrency());  
 }  
  
 private void setupExchangeRates() {  
 exchangeRates.put("USD", 1.0);  
 exchangeRates.put("EUR", 0.92);  
 exchangeRates.put("GBP", 0.78);  
 exchangeRates.put("INR", 82.5);  
 exchangeRates.put("JPY", 132.0);  
 }  
 private void convertCurrency() {  
 String fromCurrency = spinnerFrom.getSelectedItem().toString();  
 String toCurrency = spinnerTo.getSelectedItem().toString();  
 String amountStr = editAmount.getText().toString();  
  
 if (amountStr.isEmpty()) {  
 Toast.makeText(this, getString(R.string.enter\_amount), Toast.LENGTH\_SHORT).show();  
 return;  
 }  
  
 double amount = Double.parseDouble(amountStr);  
  
 // Safely get exchange rates to avoid NullPointerException  
 double fromRate = exchangeRates.getOrDefault(fromCurrency, 1.0);  
 double toRate = exchangeRates.getOrDefault(toCurrency, 1.0);  
  
 // Perform conversion  
 double convertedAmount = (amount / fromRate) \* toRate;  
  
 // Format the result correctly with proper locale  
 String resultText = getString(R.string.converted\_amount, String.format(Locale.US, "%.2f", convertedAmount), toCurrency);  
 textResult.setText(resultText);  
 }  
}**OUTPUT**



**6.** **Create a SIGNUp activity with Username and Password. Validation of password should happen based on the following rules:**

**• Password should contain uppercase and lowercase letters.**

**• Password should contain letters and numbers.**

**• Password should contain special characters.**

**• Minimum length of the password (the default value is 8).**

**On successful SIGN UP proceed to the next Login activity. Here the user should SIGN IN using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying “Successful Login” or else display a toast message saying “Login Failed”. The user is given only two attempts and after that display a toast message saying “Failed Login Attempts” and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.**

**1) Firstly, Create an Application by Name “SignUpApplication”**

**2) Go to xml code of design change the layout to “RelativeLayout”**

**3) Add TextView component & change the following properties: • Size: 24sp • Text: “Sign Up” • Center-Align**

**4) Add Email (EditText) component & change the following properties in XML Code: • Hint: “Email-ID” • id: “@+id/emailEditText”**

**5) Add Password (EditText) component & change the following properties in XML Code: • Hint: “Password” • id: “@+id/passwordEditText”**

**6) Add Button component & change the following properties in XML • Id: “@+id/signBtn” • Text: “Sign Up”**

**MainActivity**

**XML-CODE-**

*<?*xml version="1.0" encoding="utf-8"*?>*<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:layout\_width="129dp"  
 android:layout\_height="45dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="168dp"  
 android:layout\_marginRight="168dp"  
 android:layout\_marginBottom="596dp"  
 android:text="@string/sign\_up"  
 android:textAlignment="center"  
 android:textSize="34sp"  
 android:textStyle="bold"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintLeft\_toLeftOf="parent"  
 app:layout\_constraintRight\_toRightOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 tools:ignore="RtlHardcoded,TextSizeCheck" />  
  
 <EditText  
 android:id="@+id/SignUp\_email"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="103dp"  
 android:layout\_marginRight="103dp"  
 android:layout\_marginBottom="463dp"  
 android:ems="10"  
 android:hint="@string/emailid"  
 android:inputType="textPersonName"  
 android:minHeight="48dp"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,RtlHardcoded,TextFields" />  
  
 <Button  
 android:id="@+id/signUpBtn"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="168dp"  
 android:layout\_marginRight="168dp"  
 android:layout\_marginBottom="245dp"  
 android:text="Sign Up"  
 tools:ignore="DuplicateSpeakableTextCheck,HardcodedText,RtlHardcoded" />  
  
 <EditText  
 android:id="@+id/SignUp\_Password"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="101dp"  
 android:layout\_marginRight="101dp"  
 android:layout\_marginBottom="385dp"  
 android:ems="10"  
 android:hint="@string/password"  
 android:inputType="textPassword"  
 android:minHeight="48dp"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,RtlHardcoded" />  
</RelativeLayout>

**JAVA-CODE**

package com.example.signupapp;  
  
import android.content.Intent;  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.Toast;  
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {  
EditText email\_Sign , password\_Sign ;  
Button signUp\_btn;

@Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);

email\_Sign =findViewById(R.id.*SignUp\_email*);  
 password\_Sign = findViewById(R.id.*SignUp\_Password*);  
 signUp\_btn=findViewById(R.id.*signUpBtn*);

signUp\_btn.setOnClickListener(v -> {  
 String email = email\_Sign.getText().toString();  
 String password = password\_Sign.getText().toString();  
 if(!isValidPassword(password)) {  
 Toast.*makeText*(MainActivity.this, "Password doesnot match ", Toast.*LENGTH\_SHORT*).show();  
 return;  
 }  
 Intent intent = new Intent(MainActivity.this, LoginActivity.class);  
 intent.putExtra("email",email);  
 intent.putExtra("password",password);  
 startActivity(intent);  
 });  
 }  
 Pattern lowerCase = Pattern.*compile*("^.\*[a-z].\*$");  
 Pattern upperCase = Pattern.*compile*("^.\*[A-Z].\*$");  
 Pattern number = Pattern.*compile*("^.\*[0-9].\*$");  
 Pattern special\_Chara = Pattern.*compile*(".\*[^a-zA-Z0-9].\*$");  
  
 private Boolean isValidPassword(String password ){  
 if(password.length()<8) {  
 return false;  
 }  
 if(!lowerCase.matcher(password).matches()) {  
 return false;  
 }  
 if(!upperCase.matcher(password).matches()) {  
 return false;  
 }  
 if(!number.matcher(password).matches()) {  
 return false;  
 }  
 return special\_Chara.matcher(password).matches();  
 }

}

**LoginActivity**

**1) Right click on Java folder-> new-> activity->empty activity-> name it as “LoginActivity”**

**2) Go to xml code of design change the layout to “RelativeLayout”**

**3) Add TextView component & change the following properties: • Size: 38dp • Text: “Login” • Center-Align**

**4) Add Email (EditText) component & change the following properties in XML Code: • Hint: “Email ID” • id: “@+id/emailEditText”**

**5) Add Password (EditText) component & change the following properties in XML Code: • Hint: “Password” • id: “@+id/passwordEditText”**

**6) Add Button component & change the following properties in XML • Id: “@+id/loginBtn” • Text: “Login”**

**XML-CODE**

*<?*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=".loginActivity">  
  
 <TextView  
 android:id="@+id/loginTextView"  
 android:layout\_width="225dp"  
 android:layout\_height="45dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="113dp"  
 android:layout\_marginRight="113dp"  
 android:layout\_marginBottom="544dp"  
 android:text="@string/edlogin"  
 android:textAlignment="center"  
 android:textSize="34sp"  
 android:textStyle="bold"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 tools:ignore="RtlHardcoded,TextSizeCheck"  
 tools:layout\_editor\_absoluteX="143dp" />  
  
 <EditText  
 android:id="@+id/passEditText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="124dp"  
 android:layout\_marginRight="124dp"  
 android:layout\_marginBottom="380dp"  
 android:ems="10"  
 android:hint="@string/login\_password"  
 android:inputType="textPassword"  
 android:minHeight="48dp"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,RtlHardcoded" />  
  
 <Button  
 android:id="@+id/loginBtn"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"   
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="168dp"  
 android:layout\_marginRight="168dp"  
 android:layout\_marginBottom="263dp"  
 android:text="@string/login"  
 tools:ignore="DuplicateSpeakableTextCheck,RtlHardcoded" />  
  
 <EditText  
 android:id="@+id/EmaileditText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="127dp"  
 android:layout\_marginRight="127dp"  
 android:layout\_marginBottom="455dp"  
 android:ems="10"  
 android:hint="@string/email\_id"  
 android:inputType="textPersonName"  
 android:minHeight="48dp"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,RtlHardcoded,TextFields" />  
</RelativeLayout>

**JAVA-CODE**

package com.example.signupapp;  
  
import android.os.Bundle;  
import android.widget.EditText;  
import android.widget.Button;  
import android.widget.Toast;  
import android.content.Intent;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import java.util.Objects  
  
public class LoginActivity extends AppCompatActivity {  
 EditText emailEditText ,passwordEditText ;  
 Button login\_btn;  
 int counter=2;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_login*);  
 emailEditText =findViewById(R.id.*EmaileditText*);  
 passwordEditText =findViewById(R.id.*passEditText*);  
 login\_btn = findViewById(R.id.*loginBtn*);  
 String rEmail = getIntent().getStringExtra("email");  
 String rPassword= getIntent().getStringExtra("password");  
 login\_btn.setOnClickListener(v -> {  
 String email = emailEditText.getText().toString();  
 String password = passwordEditText.getText().toString();  
 if(Objects.*equals*(rEmail, email) && Objects.*equals*(rPassword, password)){  
 Intent intent= new Intent(LoginActivity.this,LoginSuccessful.class);  
 startActivity(intent);  
 }  
 else {  
 Toast.*makeText*(LoginActivity.this,"Invalid Credentials",Toast.*LENGTH\_SHORT*).show();  
 }  
 counter--;  
 if(counter==0){  
 Toast.*makeText*(getBaseContext(),"failed to login attempts",Toast.*LENGTH\_SHORT*).show();  
 login\_btn.setEnabled(false);  
 }  
 });  
 }  
}

**LoginSuccessful**

1) Right click on Java folder-> new-> activity->empty activity-> name it as “LoginSuccessful”

2) Go to xml code of design change the layout to “RelativeLayout”

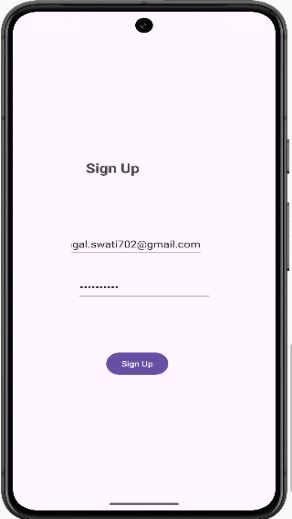
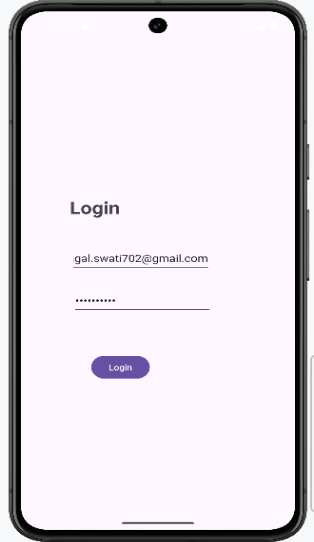
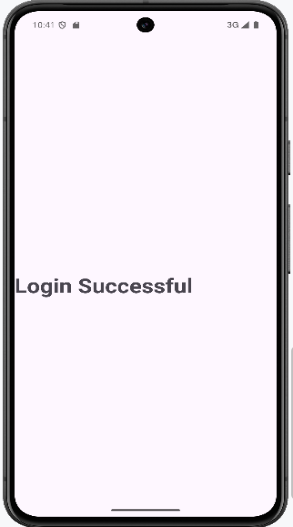
3) Add TextView component & change the following properties: • Size: 38dp • Text: “Login Successful” • Center-Align

**XML-CODE**

*<?*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"  
 tools:context=".LoginSuccessful">  
 <TextView  
 android:id="@+id/textView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="121dp"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentRight="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginEnd="-11dp"  
 android:layout\_marginRight="-11dp"  
 android:layout\_marginBottom="322dp"  
 android:text="@string/login\_successful"  
 android:textSize="36sp"  
 android:textStyle="bold"  
 tools:ignore="RtlHardcoded,VisualLintBounds" />  
</RelativeLayout>

**JAVA-CODE**

package com.example.signupapp;  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class LoginSuccessful extends AppCompatActivity {  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_login\_successful*);  
 }  
}

**OUTPUT**

**7.Developing an Android Application Using Implicit Intents (Dialer & Gallery)**

An Intent in Android is a messaging object used to request an action from another app or component. There are two types:

Explicit Intent: Used to navigate between activities inside the same app.

Implicit Intent: Used to request actions from external apps (e.g., opening the dialer or gallery).

📌 What is an Implicit Intent?

An Implicit Intent does not specify the exact component to be called. Instead, it requests the system to find an appropriate app that can handle the request.

Examples of Implicit Intents:

Intent.ACTION\_DIAL → Opens the Phone Dialer.

Intent.ACTION\_PICK → Opens the Gallery/Image Picker

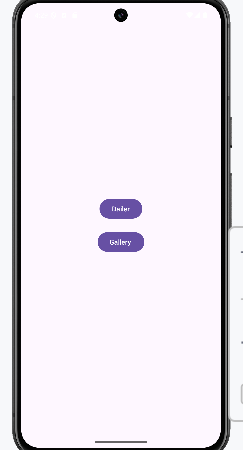
**XML-CODE**

<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:orientation="vertical"  
 android:gravity="center"  
 android:padding="20dp">  
  
 <Button  
 android:id="@+id/btnDialer"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/dailer" />  
  
 <Button  
 android:id="@+id/btnGallery"  
 android:layout\_width="wrap\_content"   
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="20dp"  
 android:text="Gallery "  
 tools:ignore="HardcodedText" />  
  
</LinearLayout>

**JAVA-CODE**

package com.example.dailer\_gallery;  
import android.content.Intent;  
import android.net.Uri;  
import android.os.Bundle;  
import android.widget.Button;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
 Button btnDialer, btnGallery;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 btnDialer = findViewById(R.id.*btnDialer*);  
 btnGallery = findViewById(R.id.*btnGallery*);  
  
 *// Open Dialer when button is clicked* btnDialer.setOnClickListener(v -> {  
 Intent dialIntent = new Intent(Intent.*ACTION\_DIAL*);  
 dialIntent.setData(Uri.*parse*("tel:")); *// Opens the dialer without a number* startActivity(dialIntent);  
 }); *// Open Gallery when button is clicked* btnGallery.setOnClickListener(v -> {  
 Intent i=new Intent();  
 i.setAction(Intent.*ACTION\_VIEW*);  
 i.setData(Uri.*parse*("content://media/external/images/media/"));  
 startActivity(i);  
  
 });  
 }  
}

**OUTPUT**



**8.Develop an Android application Tourist spot with three activities : Welcome page, Display attractions of tourist spot and Webpage of the tourist spot.**

A basic Android application for a tourist spot with three activities:

1. Welcome Page – A simple splash screen or welcome message.
2. Display Attractions – Shows a list of attractions with images and descriptions.
3. Webpage of the Tourist Spot – Opens a webpage inside a WebView.

**1.MainActivity: The welcome screen.**

**XML file:**

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:gravity="center"  
 android:padding="16dp">  
  
 <TextView  
 android:id="@+id/welcome\_text"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/welcome\_to\_the\_tourist\_spot"  
 android:textSize="20sp"  
 android:textStyle="bold"  
 android:padding="10dp"/>  
</LinearLayout>

**JAVA file**

package com.example.touristspot;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.widget.TextView;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 TextView welcomeText = findViewById(R.id.*welcome\_text*);  
 welcomeText.setOnClickListener(v -> {  
 Intent intent = new Intent(MainActivity.this, AttractionsActivity.class);  
 startActivity(intent);  
 });  
 }  
}

2.**AttractionsActivity: Displays a list of attractions**.

**XML file**

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <ListView  
 android:id="@+id/attractions\_list"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"/>  
</LinearLayout>

**JAVA File**

package com.example.touristspot;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.widget.ArrayAdapter;  
import android.widget.ListView;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class AttractionsActivity extends AppCompatActivity {  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_attractions*);  
  
 ListView listView = findViewById(R.id.*attractions\_list*);  
 String[] attractions = {"Museum", "Park", "Beach", "Historical Site"};  
  
 ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_list\_item\_1*, attractions);  
 listView.setAdapter(adapter);  
  
 listView.setOnItemClickListener((parent, view, position, id) -> {  
 Intent intent = new Intent(AttractionsActivity.this, WebpageActivity.class);  
 startActivity(intent);

});  
 }  
}

2.**WebpageActivity: Loads a webpage of the tourist spot.**

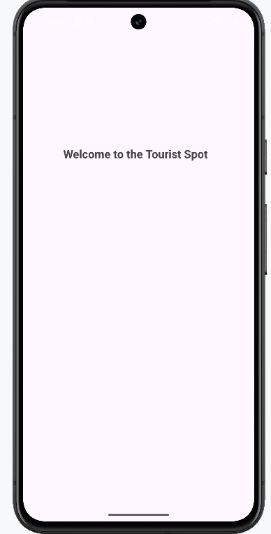
**XML file**

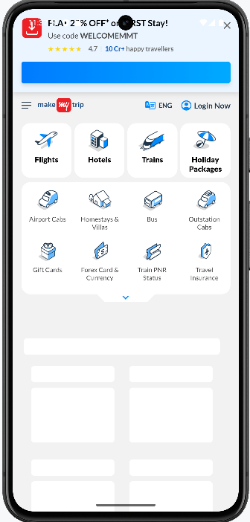
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical">  
  
 <WebView  
 android:id="@+id/webview"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"/>  
</LinearLayout>

**JAVA file**

package com.example.touristspot;  
  
import android.annotation.SuppressLint;  
import android.os.Bundle;  
import android.webkit.WebView;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class WebpageActivity extends AppCompatActivity {  
 @SuppressLint("SetJavaScriptEnabled")  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_webpage*);  
  
 WebView webView = findViewById(R.id.*webview*);  
 webView.getSettings().setJavaScriptEnabled(true);  
 webView.loadUrl("https://www.makemytrip.com/"); *// Replace with actual tourist spot URL* }

**OUTPUT**

****

****

**9.Develop an android application for background music app.**

Build the Background Music App

 Create a new Android project in Android Studio with Empty Activity.

 Add a raw music file to the res/raw folder.

 Design the UI using XML.

 Implement the functionality using Java.

1. Add a Music File
2. C**reate the** raw **folder (if not already present)**

* In Android Studio, go to res/ (inside app/src/main/res/).
* Right-click on res/ → **New** → **Android Resource Directory**.
* In the **Resource Type**, select **raw** → Click **OK**.

1. **Copy the MP3 file-**Place your **MP3 file** (e.g., background\_music.mp3) inside res/raw/.

XML Layout (activity\_main.xml)

This layout includes:

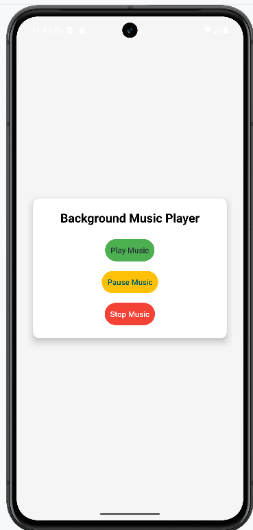
* A CardView for styling.
* Three buttons: Play, Pause, and Stop.

*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center"  
 android:orientation="vertical"  
 android:padding="20dp"  
 android:background="#F5F5F5">  
  
 <androidx.cardview.widget.CardView  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_margin="10dp"  
 app:cardCornerRadius="12dp"  
 app:cardElevation="8dp">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:gravity="center"  
 android:orientation="vertical"  
 android:padding="20dp">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/background\_music\_player"  
 android:textSize="22sp"  
 android:textColor="#000"  
 android:textStyle="bold"  
 android:paddingBottom="20dp" />  
  
 <Button  
 android:id="@+id/btnPlay"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="10dp"  
 android:backgroundTint="#4CAF50"  
 android:padding="10dp"  
 android:text="@string/play\_music"  
 android:textColor="#263238" />  
  
 <Button  
 android:id="@+id/btnPause"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="10dp"  
 android:backgroundTint="#FFC107"  
 android:padding="10dp"  
 android:text="@string/pause\_music"  
 android:textColor="#006064" />  
  
 <Button  
 android:id="@+id/btnStop"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/stop\_music"  
 android:backgroundTint="#F44336"  
 android:textColor="#FFF"  
 android:padding="10dp"/>  
 </LinearLayout>  
 </androidx.cardview.widget.CardView>  
  
</LinearLayout>

**JAVA FILE**

package com.example.musicapp;  
  
import android.media.MediaPlayer;  
import android.os.Bundle;  
  
import android.widget.Button;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
 MediaPlayer mediaPlayer;  
 Button btnPlay, btnPause, btnStop;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 btnPlay = findViewById(R.id.*btnPlay*);  
 btnPause = findViewById(R.id.*btnPause*);  
 btnStop = findViewById(R.id.*btnStop*);  
  
 *// Initialize MediaPlayer with music file* if (mediaPlayer == null) {  
 mediaPlayer = MediaPlayer.*create*(this, R.raw.*background\_music*);  
 }  
  
 *// Play button* btnPlay.setOnClickListener(v -> {  
 if (!mediaPlayer.isPlaying()) {  
 mediaPlayer.start();  
 }  
 });  
  
 *// Pause button* btnPause.setOnClickListener(v -> {  
 if (mediaPlayer.isPlaying()) {  
 mediaPlayer.pause();  
 }  
 });  
  
 *// Stop button* btnStop.setOnClickListener(v -> {  
 if (mediaPlayer.isPlaying()) {  
 mediaPlayer.stop();  
 mediaPlayer.release();  
 mediaPlayer = MediaPlayer.*create*(MainActivity.this, R.raw.*background\_music*);  
 }  
 });  
 }  
  
 @Override  
 protected void onDestroy() {  
 super.onDestroy();  
 if (mediaPlayer != null) {  
 mediaPlayer.release();  
 }  
 }  
}

**OUTPUT:**

****

**10.** **Develop an Android Audio Recording Application.**

This app will have three buttons:

* + btnRecord: Starts recording.
  + btnStop: Stops recording.
  + btnPlay: Plays the recorded audio.
* btnStop and btnPlay are disabled initially (enabled only after recording).

Step 1 : Add a Mic Icon

Download an SVG or PNG Mic Icon

* Search “mic” → Download the SVG or PNG version.

Add it to res/drawable/

* Paste the file inside res/drawable/.

Use the Image in activity\_main.xml

Step 2:Modify AndroidManifest.xml

1. Open AndroidManifest.xml (located in app/src/main/AndroidManifest.xml).
2. Add the following permissions inside the <manifest> tag:

**XML**

**<uses-permission android:name="android.permission.RECORD\_AUDIO"/>**

**<uses-permission android:name="android.permission.WRITE\_EXTERNAL\_STORAGE"/>**

**<uses-permission android:name="android.permission.READ\_EXTERNAL\_STORAGE"/>**

**Step 3 :Create an activity\_main.xml**

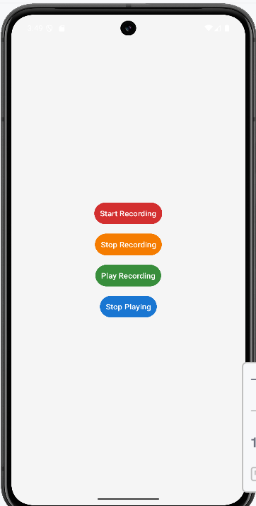
**XML FILE**

<?xml version="1.0" encoding="utf-8"?>  
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:gravity="center"  
 android:padding="20dp"  
 android:background="#F5F5F5">  
 <Button  
 android:id="@+id/btnRecord"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/startrecording"  
 android:textColor="#FFFFFF"  
 android:backgroundTint="#D32F2F"  
 android:padding="10dp"  
 android:layout\_margin="5dp"/>  
  
 <Button  
 android:id="@+id/btnStop"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/stoprecording"  
 android:textColor="#FFFFFF"  
 android:backgroundTint="#F57C00"  
  
 android:padding="10dp"  
 android:layout\_margin="5dp"  
 android:enabled="false"/>  
  
 <Button  
 android:id="@+id/btnPlay"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/playrecording"  
 android:textColor="#FFFFFF"  
 android:backgroundTint="#388E3C"  
 android:padding="10dp"  
 android:layout\_margin="5dp"  
 android:enabled="false"/>  
  
 <Button  
 android:id="@+id/btnStopPlay"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="@string/stopplaying"  
 android:textColor="#FFFFFF"  
 android:backgroundTint="#1976D2"  
 android:padding="10dp"  
 android:layout\_margin="5dp"  
 android:enabled="false"/>  
</LinearLayout>

**Step 4 :Create an MainActivity.java**

**JAVA FILE**package com.example.audiorecorder;  
  
import android.Manifest;  
import android.content.pm.PackageManager;  
import android.media.MediaPlayer;  
import android.media.MediaRecorder;  
import android.os.Bundle;  
import android.os.Environment;  
import android.util.Log;  
import android.widget.Button;  
import android.widget.Toast;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.app.ActivityCompat;  
import androidx.core.content.ContextCompat;  
import java.io.IOException;  
  
public class MainActivity extends AppCompatActivity {  
  
 private Button btnRecord, btnStop, btnPlay, btnStopPlay;  
 private MediaRecorder mediaRecorder;  
 private MediaPlayer mediaPlayer;  
 private String audioFilePath;  
 private static final String *TAG* = "AudioRecorder"; *// Logging Tag* @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 btnRecord = findViewById(R.id.*btnRecord*);  
 btnStop = findViewById(R.id.*btnStop*);  
 btnPlay = findViewById(R.id.*btnPlay*);  
 btnStopPlay = findViewById(R.id.*btnStopPlay*);  
  
 *// Request permissions at runtime* if (ContextCompat.*checkSelfPermission*(this, Manifest.permission.*RECORD\_AUDIO*) != PackageManager.*PERMISSION\_GRANTED* ||  
 ContextCompat.*checkSelfPermission*(this, Manifest.permission.*WRITE\_EXTERNAL\_STORAGE*) != PackageManager.*PERMISSION\_GRANTED*) {  
 ActivityCompat.*requestPermissions*(this, new String[]{Manifest.permission.*RECORD\_AUDIO*, Manifest.permission.*WRITE\_EXTERNAL\_STORAGE*}, 1000);  
 }  
  
 *// File path to store audio* audioFilePath = getExternalFilesDir(Environment.*DIRECTORY\_MUSIC*) + "/recorded\_audio.3gp";  
  
 *// Button Click Listeners* btnRecord.setOnClickListener(view -> startRecording());  
 btnStop.setOnClickListener(view -> stopRecording());  
 btnPlay.setOnClickListener(view -> playRecording());  
 btnStopPlay.setOnClickListener(view -> stopPlaying());  
 }  
  
 *// Start Recording* private void startRecording() {  
 mediaRecorder = new MediaRecorder();  
 mediaRecorder.setAudioSource(MediaRecorder.AudioSource.*MIC*);  
 mediaRecorder.setOutputFormat(MediaRecorder.OutputFormat.*THREE\_GPP*);  
 mediaRecorder.setAudioEncoder(MediaRecorder.AudioEncoder.*AMR\_NB*);  
 mediaRecorder.setOutputFile(audioFilePath);  
 try {  
 mediaRecorder.prepare();  
 mediaRecorder.start();  
 Toast.*makeText*(this, "Recording started...", Toast.*LENGTH\_SHORT*).show();  
 btnRecord.setEnabled(false);  
 btnStop.setEnabled(true);  
 btnPlay.setEnabled(false);  
 btnStopPlay.setEnabled(false);  
 } catch (IOException e) {  
 Log.*e*(*TAG*, "Recording failed: " + e.getMessage());  
 }  
 }  
  
 *// Stop Recording* private void stopRecording() {  
 if (mediaRecorder != null) {  
 try {  
 mediaRecorder.stop();  
 mediaRecorder.release();  
 mediaRecorder = null;  
 Toast.*makeText*(this, "Recording saved!", Toast.*LENGTH\_SHORT*).show();  
 btnRecord.setEnabled(true);  
 btnStop.setEnabled(false);  
 btnPlay.setEnabled(true);  
 btnStopPlay.setEnabled(false);  
 } catch (RuntimeException e) {  
 Log.*e*(*TAG*, "Stopping recording failed: " + e.getMessage());  
 }  
 }  
 }  
 *// Play the Recorded Audio* private void playRecording() {  
 mediaPlayer = new MediaPlayer();  
 try {  
 mediaPlayer.setDataSource(audioFilePath);  
 mediaPlayer.prepare();  
 mediaPlayer.start();  
 Toast.*makeText*(this, "Playing recording...", Toast.*LENGTH\_SHORT*).show();  
 btnPlay.setEnabled(false);  
 btnStopPlay.setEnabled(true);  
 *// Enable play button when playback completes* mediaPlayer.setOnCompletionListener(mp -> {  
 btnPlay.setEnabled(true);  
 btnStopPlay.setEnabled(false);  
 });  
  
 } catch (IOException e) {  
 Log.*e*(*TAG*, "Playback failed: " + e.getMessage());  
 }  
 }  
 *// Stop Playing the Recorded Audio* private void stopPlaying() {  
 if (mediaPlayer != null && mediaPlayer.isPlaying()) {  
 try {  
 mediaPlayer.stop();  
 mediaPlayer.release();  
 mediaPlayer = null;  
 Toast.*makeText*(this, "Playback stopped!", Toast.*LENGTH\_SHORT*).show();  
 btnPlay.setEnabled(true);  
 btnStopPlay.setEnabled(false);  
 } catch (RuntimeException e) {  
 Log.*e*(*TAG*, "Stopping playback failed: " + e.getMessage());  
 }  
 }  
 }  
}

**OUTPUT**

****

**11.** **Develop an Android application The Expense Manager using Android. The application should store all the expenses in a file.**

A basic Android application in Java that allows users to add expenses and store them in a file.

 Add Expense (Amount, Category, Description)

 Save to File (Stored in internal storage as a text file)

 View Expenses (Load from the saved file)

 Simple UI (Using XML-based layouts)

**XML file**

<?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:orientation="vertical"  
 android:gravity="center"  
 android:padding="16dp">  
  
 <EditText  
 android:id="@+id/amountInput"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/enter\_amount"  
 android:inputType="numberDecimal"  
 android:minHeight="48dp"  
 android:textAlignment="center"  
 tools:ignore="Autofill,VisualLintTextFieldSize" />  
  
 <EditText  
 android:id="@+id/categoryInput"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/enter\_category"  
 android:minHeight="48dp"  
 android:textAlignment="center"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,TextFields,VisualLintTextFieldSize" />  
  
 <EditText  
 android:id="@+id/descriptionInput"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/enter\_description"  
 android:minHeight="48dp"  
 android:textAlignment="center"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,TextFields,VisualLintTextFieldSize" />  
  
 <Button  
 android:id="@+id/saveButton"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/save\_expense"  
 android:layout\_marginTop="10dp"  
 tools:ignore="VisualLintButtonSize" />  
  
 <Button  
 android:id="@+id/viewButton"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/view\_expenses"  
 android:layout\_marginTop="10dp"  
 tools:ignore="VisualLintButtonSize" />  
  
 <Button  
 android:id="@+id/deleteButton"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="10dp"  
 android:backgroundTint="@android:color/holo\_red\_light"  
 android:text="@string/delete\_expenses"  
 android:textColor="#212121"  
 tools:ignore="VisualLintButtonSize" />  
  
 <TextView  
 android:id="@+id/expensesView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/expenses\_will\_appear\_here"  
 android:textSize="16sp"  
 android:paddingTop="10dp"  
 android:textAlignment="center" />  
  
</LinearLayout>

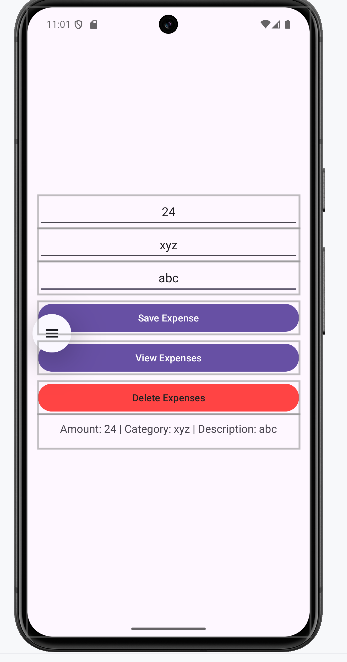
**JAVA FILE** This is the main Java activity for "The Expense Manager" Android app. It allows users to add expenses and store them in a text file, which can later be retrieved and displayed**.**

package com.example.expensemanager;  
import android.annotation.SuppressLint;  
import android.os.Bundle;  
import android.util.Log;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import android.widget.EditText;  
import android.widget.Button;  
import android.widget.TextView;  
import android.widget.Toast;  
  
import java.io.File;  
import java.io.FileOutputStream;  
import java.io.FileReader;  
import java.io.IOException;  
import java.io.BufferedReader;  
  
  
public class MainActivity extends AppCompatActivity {  
 EditText categoryInput,amountInput;  
 EditText descriptionInput;  
 Button saveButton,viewButton,deleteButton;  
 TextView expensesView;  
private final String FILE\_NAME = "expenses.txt";  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.enable(this);  
 setContentView(R.layout.activity\_main);  
 amountInput = findViewById(R.id.amountInput);  
 categoryInput = findViewById(R.id.categoryInput);  
 descriptionInput = findViewById(R.id.descriptionInput);  
 saveButton = findViewById(R.id.saveButton);  
 viewButton = findViewById(R.id.viewButton);  
 deleteButton=findViewById(R.id.deleteButton);  
 expensesView = findViewById(R.id.expensesView);  
 saveButton.setOnClickListener(v -> saveExpense());  
  
 viewButton.setOnClickListener(v -> loadExpenses());  
  
 deleteButton.setOnClickListener(v -> deleteExpenses());  
 }  
  
 private void saveExpense() {  
 String amount = amountInput.getText().toString().trim();  
 String category = categoryInput.getText().toString().trim();  
 String description = descriptionInput.getText().toString().trim();  
  
 if (amount.isEmpty() || category.isEmpty() || description.isEmpty()) {  
 Toast.makeText(this, "Please fill all fields", Toast.LENGTH\_SHORT).show();  
 return;  
 }  
  
 String expenseEntry = "Amount: " + amount + " | Category: " + category + " | Description: " + description + "\n";  
  
 try (FileOutputStream fos = openFileOutput(FILE\_NAME, MODE\_APPEND)) {  
 fos.write(expenseEntry.getBytes());  
 Toast.makeText(this, "Expense saved!", Toast.LENGTH\_SHORT).show();  
 } catch (IOException e) {  
 Log.e("ExpenseManager", "Error saving expense", e);  
 Toast.makeText(this, "Error saving expense", Toast.LENGTH\_SHORT).show();  
 }  
 }  
  
 private void loadExpenses() {  
 File file = new File(getFilesDir(), FILE\_NAME);  
 if (!file.exists()) {  
 Toast.makeText(this, "No expenses recorded yet.", Toast.LENGTH\_SHORT).show();  
 return;  
 }  
  
 StringBuilder stringBuilder = new StringBuilder();  
 try (BufferedReader br = new BufferedReader(new FileReader(file))) {  
 String line;  
 while ((line = br.readLine()) != null) {  
 stringBuilder.append(line).append("\n");  
 }  
 expensesView.setText(stringBuilder.toString());  
 } catch (IOException e) {  
 Log.e("ExpenseManager", "Error loading expenses", e);  
 Toast.makeText(this, "Error loading expenses", Toast.LENGTH\_SHORT).show();  
 }  
 }  
  
 @SuppressLint("SetTextI18n")  
 private void deleteExpenses() {  
 File file = new File(getFilesDir(), FILE\_NAME);  
 if (file.exists()) {  
 if (file.delete()) {  
 Toast.makeText(this, "All expenses deleted!", Toast.LENGTH\_SHORT).show();  
 expensesView.setText("No expenses yet.");  
 } else {  
 Toast.makeText(this, "Failed to delete expenses", Toast.LENGTH\_SHORT).show();  
 }  
 } else {  
 Toast.makeText(this, "No expenses to delete", Toast.LENGTH\_SHORT).show();  
 }  
 }  
 }

MENIFEST FILE

<?xml version="1.0" encoding="utf-8"?>  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 package="com.example.expensemanager">  
  
 <application  
 android:allowBackup="true"  
 android:dataExtractionRules="@xml/data\_extraction\_rules"  
 android:fullBackupContent="@xml/backup\_rules"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/Theme.Expensemanager"  
 tools:targetApi="31">  
 <activity  
 android:name=".MainActivity"  
 android:exported="true">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
 </application>  
  
</manifest>

**OUTPUT**



**12.Develop an Android application The Expense Manager using Android. The application should store all the expenses in a file**

Insert student details (USN, Name, Semester)  
✔ Update existing student records  
✔ Delete student records  
✔ View all student records in a dialog box

1.Update AndroidManifest.xml

2. Update String.xml

<resources>  
 <string name="app\_name">studentdatabase</string>  
  
 <string name="hint\_usn">Enter USN</string>  
 <string name="hint\_name">Enter Name</string>  
 <string name="hint\_semester">Enter Semester</string>  
 <string name="btn\_insert">Insert</string>  
 <string name="btn\_update">Update</string>  
 <string name="btn\_delete">Delete</string>  
 <string name="btn\_view">View</string>  
</resources>

2.Design activity\_main.xml

<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:orientation="vertical"  
 android:padding="16dp"  
 tools:ignore="VisualLintBounds">  
  
 <!-- USN Input -->  
 <EditText  
 android:id="@+id/et\_usn"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/hint\_usn"  
 android:inputType="text"  
 android:padding="10dp"  
 android:minHeight="48dp"  
 tools:ignore="Autofill,VisualLintTextFieldSize" />  
  
 <!-- Name Input -->  
 <EditText  
 android:id="@+id/et\_name"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/hint\_name"  
 android:inputType="textPersonName"  
 android:padding="10dp"  
 android:minHeight="48dp"  
 tools:ignore="Autofill,VisualLintTextFieldSize" />  
  
 <!-- Semester Input -->  
 <EditText  
 android:id="@+id/et\_semester"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="@string/hint\_semester"  
 android:inputType="number"  
 android:minHeight="48dp"  
 android:padding="10dp"  
 android:textColorHint="#546E7A"  
 tools:ignore="Autofill,VisualLintTextFieldSize" />  
  
 <!-- Buttons Row 1 -->  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal"  
 android:gravity="center"  
 android:paddingTop="8dp">  
  
 <Button  
 android:id="@+id/btn\_insert"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="@string/btn\_insert"  
 android:minWidth="100dp"  
 android:maxWidth="150dp"  
 android:padding="8dp"  
 tools:ignore="ButtonStyle,VisualLintButtonSize" />  
  
 <Button  
 android:id="@+id/btn\_update"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="@string/btn\_update"  
 android:minWidth="100dp"  
 android:maxWidth="150dp"  
 android:padding="8dp"  
 tools:ignore="ButtonStyle,VisualLintButtonSize" />  
 </LinearLayout>  
  
 <!-- Buttons Row 2 -->  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal"  
 android:gravity="center"  
 android:paddingTop="8dp">  
  
 <Button  
 android:id="@+id/btn\_delete"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="@string/btn\_delete"  
 android:minWidth="100dp"  
 android:maxWidth="150dp"  
 android:padding="8dp"  
 tools:ignore="ButtonStyle,VisualLintButtonSize" />  
  
 <Button  
 android:id="@+id/btn\_view"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="@string/btn\_view"  
 android:minWidth="100dp"  
 android:maxWidth="150dp"  
 android:padding="8dp"  
 android:layout\_margin="20dp"  
 tools:ignore="ButtonStyle,VisualLintButtonSize" />  
 </LinearLayout>  
  
 <!-- ListView (Fixed Visibility Issue) -->  
 <ListView  
 android:id="@+id/list\_view"  
 android:layout\_width="match\_parent"  
 android:layout\_height="0dp"  
 android:layout\_weight="1"  
 android:paddingTop="8dp"  
 android:divider="@android:color/darker\_gray"  
 android:dividerHeight="1dp"/>  
</LinearLayout>

3.Create DatabaseHelper.java (SQLite Helper Class)

package com.example.studentdatabase;  
  
import android.content.ContentValues;  
import android.content.Context;  
import android.database.Cursor;  
import android.database.sqlite.SQLiteDatabase;  
import android.database.sqlite.SQLiteOpenHelper;  
  
public class DatabaseHelper extends SQLiteOpenHelper {  
  
 public static final String DATABASE\_NAME = "Student.db";  
 public static final String TABLE\_NAME = "student\_table";  
 public static final String COL\_1 = "USN";  
 public static final String COL\_2 = "NAME";  
 public static final String COL\_3 = "SEMESTER";  
  
 public DatabaseHelper(Context context) {  
 super(context, DATABASE\_NAME, null, 1);  
 }  
  
 @Override  
 public void onCreate(SQLiteDatabase db) {  
 db.execSQL("CREATE TABLE " + TABLE\_NAME + " (USN TEXT PRIMARY KEY, NAME TEXT, SEMESTER TEXT)");  
 }  
  
 @Override  
 public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {  
 db.execSQL("DROP TABLE IF EXISTS " + TABLE\_NAME);  
 onCreate(db);  
 }  
  
 public boolean insertData(String usn, String name, String semester) {  
 SQLiteDatabase db = this.getWritableDatabase();  
 ContentValues contentValues = new ContentValues();  
 contentValues.put(COL\_1, usn);  
 contentValues.put(COL\_2, name);  
 contentValues.put(COL\_3, semester);  
 long result = db.insert(TABLE\_NAME, null, contentValues);  
 return result != -1; // Returns true if insertion is successful  
 }  
  
 public boolean updateData(String usn, String name, String semester) {  
 SQLiteDatabase db = this.getWritableDatabase();  
 ContentValues contentValues = new ContentValues();  
 contentValues.put(COL\_2, name);  
 contentValues.put(COL\_3, semester);  
 int result = db.update(TABLE\_NAME, contentValues, "USN = ?", new String[]{usn});  
 return result > 0; // Returns true if update is successful  
 }  
  
 public Integer deleteData(String usn) {  
 SQLiteDatabase db = this.getWritableDatabase();  
 return db.delete(TABLE\_NAME, "USN = ?", new String[]{usn});  
 }  
  
 public Cursor getAllData() {  
 SQLiteDatabase db = this.getWritableDatabase();  
 return db.rawQuery("SELECT \* FROM " + TABLE\_NAME, null);  
 }  
}

4.Create MainActivity.java (UI & Logic)

package com.example.studentdatabase;  
  
import android.database.Cursor;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.Toast;  
import androidx.appcompat.app.AlertDialog;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
  
 DatabaseHelper databaseHelper;  
 EditText et\_usn, et\_name, et\_semester;  
 Button btn\_insert, btn\_update, btn\_delete, btn\_view;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.activity\_main);  
  
 databaseHelper = new DatabaseHelper(this);  
  
 et\_usn = findViewById(R.id.et\_usn);  
 et\_name = findViewById(R.id.et\_name);  
 et\_semester = findViewById(R.id.et\_semester);  
  
 btn\_insert = findViewById(R.id.btn\_insert);  
 btn\_update = findViewById(R.id.btn\_update);  
 btn\_delete = findViewById(R.id.btn\_delete);  
 btn\_view = findViewById(R.id.btn\_view);  
  
 addData();  
 updateData();  
 deleteData();  
 viewData();  
 }  
  
 public void addData() {  
 btn\_insert.setOnClickListener(v -> {  
 boolean isInserted = databaseHelper.insertData(  
 et\_usn.getText().toString(),  
 et\_name.getText().toString(),  
 et\_semester.getText().toString());  
  
 if (isInserted)  
 Toast.makeText(MainActivity.this, "Data Inserted", Toast.LENGTH\_SHORT).show();  
 else  
 Toast.makeText(MainActivity.this, "Insertion Failed", Toast.LENGTH\_SHORT).show();  
 });  
 }  
  
 public void updateData() {  
 btn\_update.setOnClickListener(v -> {  
 boolean isUpdated = databaseHelper.updateData(  
 et\_usn.getText().toString(),  
 et\_name.getText().toString(),  
 et\_semester.getText().toString());  
  
 if (isUpdated)  
 Toast.makeText(MainActivity.this, "Data Updated", Toast.LENGTH\_SHORT).show();  
 else  
 Toast.makeText(MainActivity.this, "Update Failed", Toast.LENGTH\_SHORT).show();  
 });  
 }  
  
 public void deleteData() {  
 btn\_delete.setOnClickListener(v -> {  
 Integer deletedRows = databaseHelper.deleteData(et\_usn.getText().toString());  
  
 if (deletedRows > 0)  
 Toast.makeText(MainActivity.this, "Data Deleted", Toast.LENGTH\_SHORT).show();  
 else  
 Toast.makeText(MainActivity.this, "Delete Failed", Toast.LENGTH\_SHORT).show();  
 });  
 }  
  
 public void viewData() {  
 btn\_view.setOnClickListener(v -> {  
 Cursor res = databaseHelper.getAllData();  
 if (res.getCount() == 0) {  
 showMessage("Error", "No records found");  
 return;  
 }  
  
 StringBuilder buffer = new StringBuilder();  
 while (res.moveToNext()) {  
 buffer.append("USN: ").append(res.getString(0)).append("\n");  
 buffer.append("Name: ").append(res.getString(1)).append("\n");  
 buffer.append("Semester: ").append(res.getString(2)).append("\n\n");  
 }  
  
 showMessage("Student Records", buffer.toString());  
 });  
 }  
  
 public void showMessage(String title, String message) {  
 AlertDialog.Builder builder = new AlertDialog.Builder(this);  
 builder.setCancelable(true);  
 builder.setTitle(title);  
 builder.setMessage(message);  
 builder.show();  
 }  
}

**OUTPUT**

