Semester	T.E. Semester VI – Computer Engineering
Subject	Mobile Computing
Subject Professor In-charge	Prof. Sneha Annappanavar
Assisting Teachers	Prof. Sneha Annappanavar
Laboratory	M310A

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Title: Case Study(Calaculator)

Explanation:

1. Design the database schema for storing student information.
2. Set up an SQLite database to manage student data locally.
3. Implement CRUD operations (Create, Read, Update, Delete) for interacting with the database.
4. Design the user interface to input, view, and modify student records.
5. Integrate database operations with UI components for user interaction.
6. Test the app thoroughly to ensure functionality and data integrity.
7. Enhance user experience with features like input validation and data management options.
8. Deploy the app via the Google Play Store or other distribution platforms for users to access and use.

Implementation:

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<AbsoluteLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_x="0dp"
    android:layout_y="0dp"
    android:background="#2A2A2A">
```

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="64dp"
    android:layout_y="124dp"
    android:fontFamily="@font/amaranth"
    android:text="Bank Acc Details"
    android:textColor="#FFA200"
    android:textSize="40sp"
    android:textStyle="bold" />

<EditText
    android:id="@+id/txtPin"
    android:layout_width="139dp"
    android:layout_height="wrap_content"
    android:layout_x="210dp"
    android:layout_y="236dp"
    android:backgroundTint="#0D23C8"
    android:fontFamily="@font/bree_serif"
    android:gravity="center"
    android:hint=""
    android:inputType="number"
    android:textSize="20sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="52dp"
    android:layout_y="256dp"
    android:fontFamily="@font/bree_serif"
    android:text="Enter PIN:"
    android:textColor="#B53625"
    android:textSize="20sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="52dp"
    android:layout_y="306dp"
    android:fontFamily="@font/bree_serif"
    android:text="Enter Acc Type:"
    android:textColor="#B53625"
    android:textSize="20sp" />
```

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="52dp"
    android:layout_y="356dp"
    android:fontFamily="@font/bree_serif"
    android:text="Enter Amount:"
    android:textColor="#B53625"
    android:textSize="20sp" />

<EditText
    android:id="@+id/txtActype"
    android:layout_width="139dp"
    android:layout_height="wrap_content"
    android:layout_x="210dp"
    android:layout_y="286dp"
    android:backgroundTint="#0D23C8"
    android:fontFamily="@font/bree_serif"
    android:gravity="center"
    android:hint=""
    android:inputType="text"
    android:textSize="20sp" />

<EditText
    android:id="@+id/txtAmount"
    android:layout_width="139dp"
    android:layout_height="wrap_content"
    android:layout_x="210dp"
    android:layout_y="336dp"
    android:backgroundTint="#0D23C8"
    android:fontFamily="@font/bree_serif"
    android:gravity="center"
    android:hint=""
    android:inputType="number"
    android:textSize="20sp" />


<Button
    android:id="@+id/btnDeb"
    android:layout_width="150dp"
    android:layout_height="62dp"
    android:layout_gravity="center"
    android:layout_x="199dp"
```

```
        android:layout_y="429dp"
        android:backgroundTint="#283593"
        android:fontFamily="@font/fascinate"
        android:text="DEBIT"
        android:textColor="#A0F600"
        android:textSize="22sp" />

    <Button
        android:id="@+id/btnCred"
        android:layout_width="140dp"
        android:layout_height="61dp"
        android:layout_x="50dp"
        android:layout_y="429dp"
        android:backgroundTint="#283593"
        android:fontFamily="@font/fascinate"
        android:text="CREDIT"
        android:textColor="#A0F600"
        android:textSize="22sp" />

    <Button
        android:id="@+id/btnCbal"
        android:layout_width="143dp"
        android:layout_height="80dp"
        android:layout_x="49dp"
        android:layout_y="494dp"
        android:backgroundTint="#283593"
        android:fontFamily="@font/fascinate"
        android:text="CHECK BALANCE"
        android:textColor="#A0F600"
        android:textSize="22sp" />

    <Button
        android:id="@+id/btnAdd"
        android:layout_width="150dp"
        android:layout_height="80dp"
        android:layout_x="202dp"
        android:layout_y="493dp"
        android:backgroundTint="#283593"
        android:fontFamily="@font/fascinate"
        android:text="ADD ACCOUNT"
        android:textColor="#A0F600"
        android:textSize="22sp" />

    <Button
```

```
        android:id="@+id/btnViewAll"
        android:layout_width="296dp"
        android:layout_height="wrap_content"
        android:layout_x="52dp"
        android:layout_y="582dp"
        android:backgroundTint="#283593"
        android:fontFamily="@font/fascinate"
        android:text="View All"
        android:textColor="#A0F600"
        android:textSize="22sp" />


</AbsoluteLayout>
```

MainActivity.java:

```
package com.example.exp11b;

import android.app.Activity;
import android.app.AlertDialog.Builder;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends Activity implements OnClickListener
{
    EditText pin, actype, amount;
    Button cred, deb, cbal, viewall, add;
    SQLiteDatabase db;
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
```

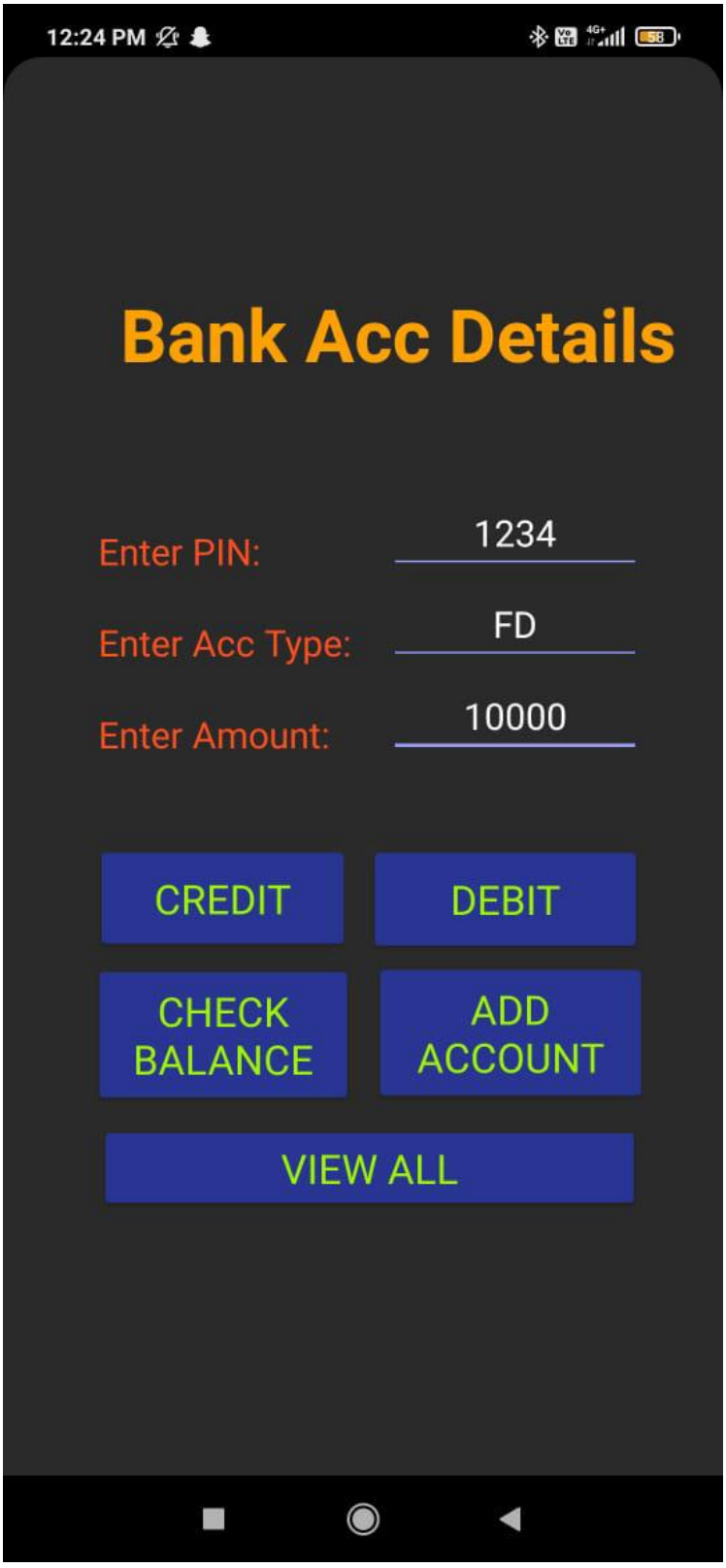
```
        pin = (EditText)findViewById(R.id.txtPin);
        actype = (EditText)findViewById(R.id.txtActype);
        amount = (EditText)findViewById(R.id.txtAmount);

        add = (Button)findViewById(R.id.btnAdd);
        cred = (Button)findViewById(R.id.btnCred);
        deb = (Button)findViewById(R.id.btnDeb);
        cbal = (Button)findViewById(R.id.btnCbal);
        viewall = (Button)findViewById(R.id.btnViewAll);

        add.setOnClickListener(this);
        cred.setOnClickListener(this);
        deb.setOnClickListener(this);
        cbal.setOnClickListener(this);
        viewall.setOnClickListener(this);

        // Creating database and table
        db=openOrCreateDatabase("BankDB", Context.MODE_PRIVATE, null);
        db.execSQL("CREATE TABLE IF NOT EXISTS bank(pin VARCHAR,actype VARCHAR,
balance VARCHAR);");
    }
    public void onClick(View view)
    {
        // Inserting a record
        if(view==add)
        {
            // Checking for empty fields
            if(pin.getText().toString().trim().length()==0||
                    actype.getText().toString().trim().length()==0||
                    amount.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter all values");
                return;
            }
            db.execSQL("INSERT INTO bank VALUES('" + pin.getText() + "','" +
actype.getText() +
                    "','" + amount.getText() + "');");
            showMessage("Success", "Account Created");
            clearText();
        }

        if(view==cred)
        {
```

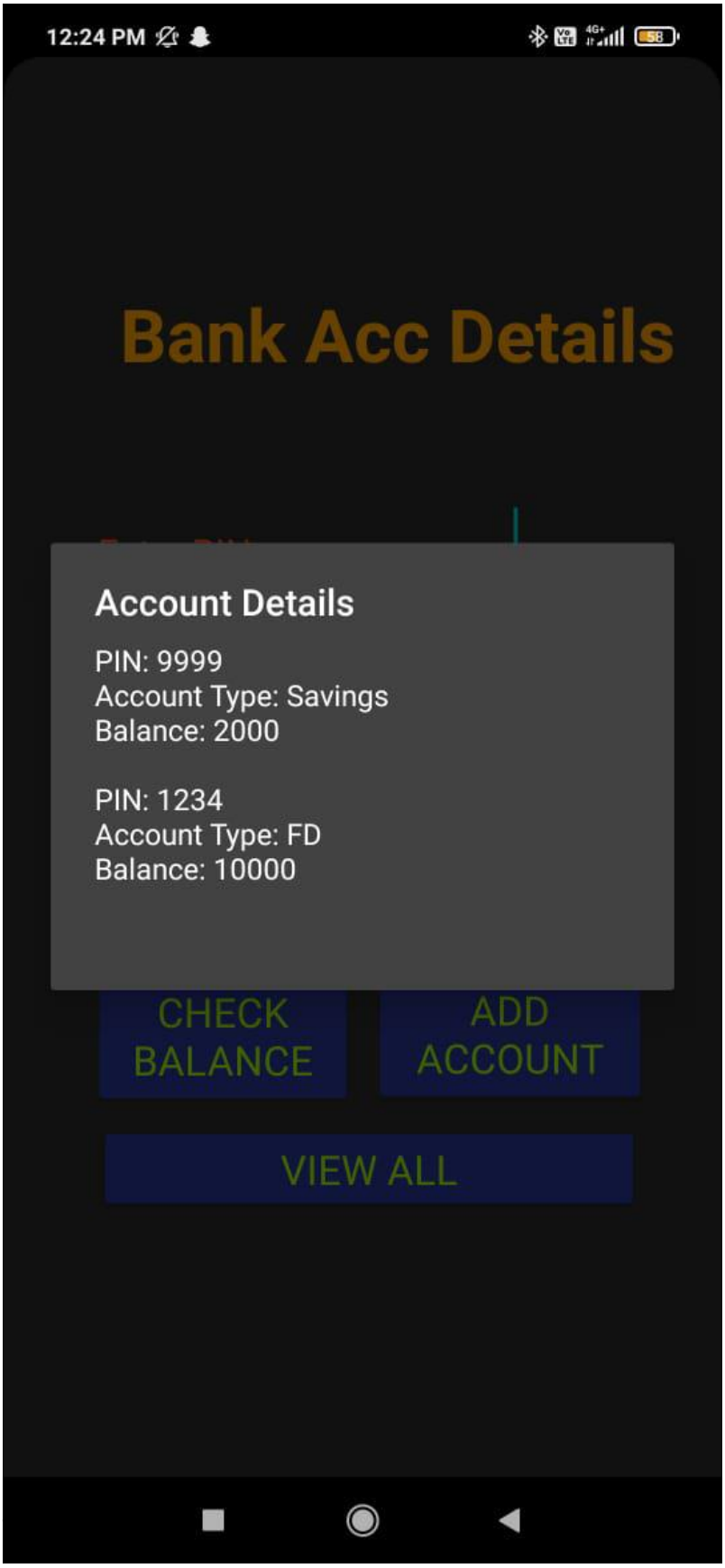
```
            // Checking for empty fields
            if(pin.getText().toString().trim().length()==0||
                    actype.getText().toString().trim().length()==0||
                    amount.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter all values!");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM bank WHERE
pin='"+pin.getText()+"'", null);
            if(c.moveToFirst())
            {
                db.execSQL("UPDATE bank SET balance = balance +
'"+amount.getText()+"' WHERE pin='"+pin.getText()+"'");
                showMessage("Success", "Amount Credited");
            }
            else
            {
                showMessage("Error", "Invalid PIN! If not registered the try
creating a new account!!");
            }

            clearText();
        }
        // Deleting a record from the Student table
        if(view==deb)
        {
            // Checking for empty roll number
            if(pin.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter PIN");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM bank WHERE
pin='"+pin.getText()+"'", null);
            if(c.moveToFirst())
            {
                db.execSQL("UPDATE bank SET balance = balance -
'"+amount.getText()+"' WHERE pin='"+pin.getText()+"'");
                showMessage("Success", "Amount Debited");
            }
            else
            {
                showMessage("Error", "Invalid PIN!");
```

```
            }
            clearText();
        }

        // Display a record from the Student table
        if(view==cbal)
        {
            // Checking for empty roll number
            if(pin.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter PIN");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM bank WHERE
pin='"+pin.getText()+"'", null);

            StringBuffer buffer=new StringBuffer();
            if(c.moveToFirst())
            {
                buffer.append("PIN: "+c.getString(0)+"\n");
                buffer.append("Account Type: "+c.getString(1)+"\n");
                buffer.append("Balance: "+c.getString(2)+"\n\n");
                showMessage("Account Details", buffer.toString());
            }
            else
            {
                showMessage("Error", "Invalid Rollno");
                clearText();
            }
        }
        // Displaying all the records
        if(view==viewall)
        {
            Cursor c=db.rawQuery("SELECT * FROM bank", null);
            if(c.getCount()==0)
            {
                showMessage("Error", "No accounts found!");
                return;
            }
            StringBuffer buffer=new StringBuffer();
            while(c.moveToNext())
            {
                buffer.append("PIN: "+c.getString(0)+"\n");
                buffer.append("Account Type: "+c.getString(1)+"\n");
```

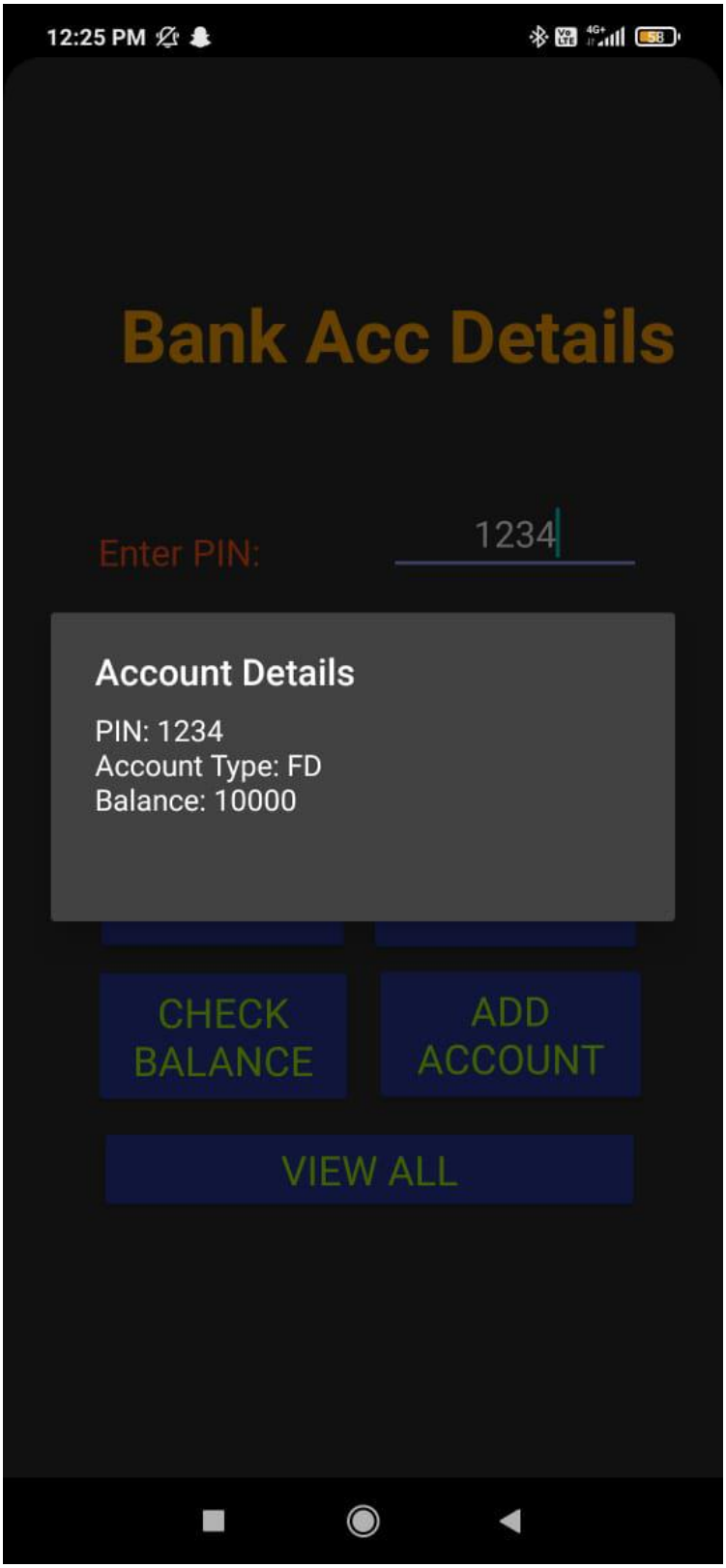
```
                buffer.append("Balance: "+c.getString(2)+"\n\n");
            }
            showMessage("Account Details", buffer.toString());
        }
    }
    public void showMessage(String title,String message)
    {
        Builder builder=new Builder(this);
        builder.setCancelable(true);
        builder.setTitle(title);
        builder.setMessage(message);
        builder.show();
    }
    public void clearText()
    {
        pin.setText("");
        actype.setText("");
        amount.setText("");
        pin.requestFocus();
    }
}
```

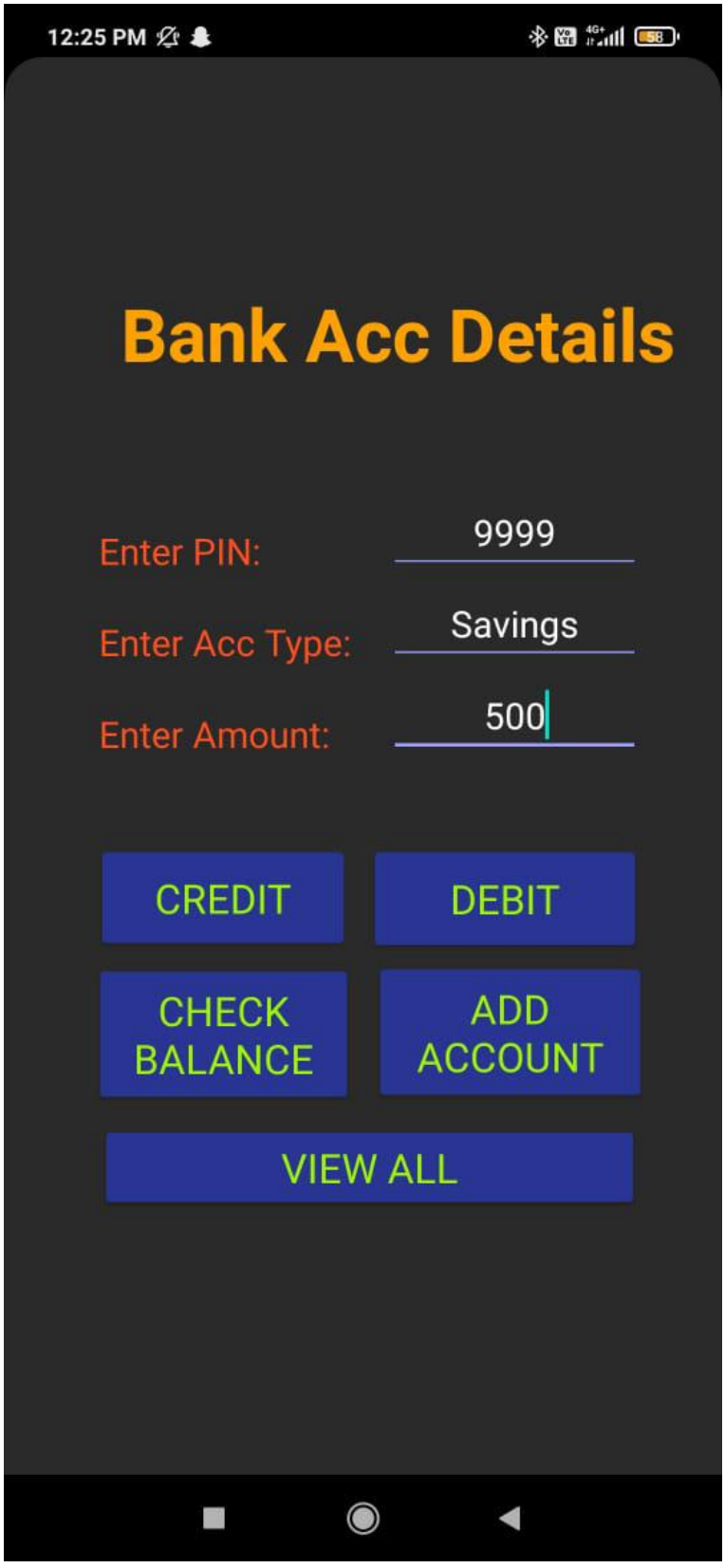
Output:

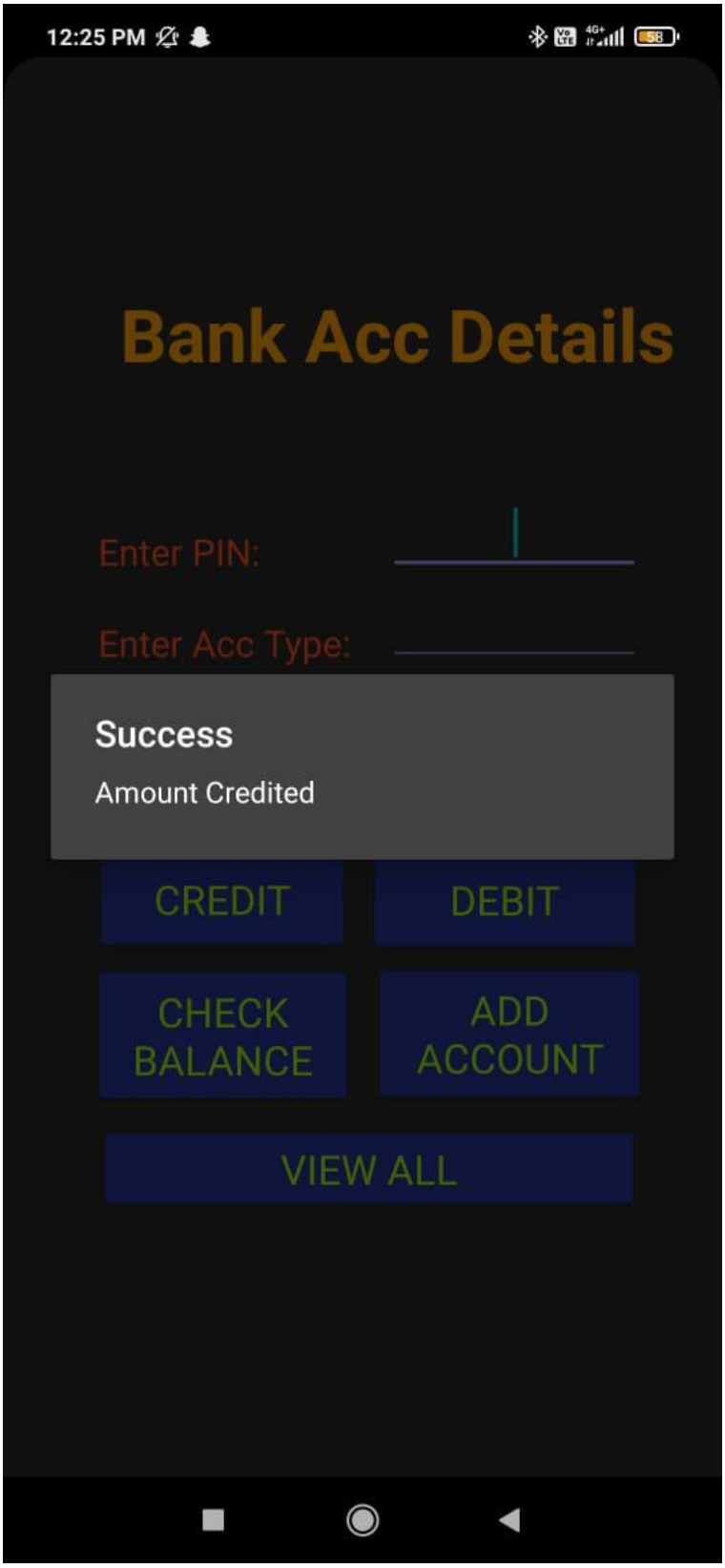

12:24 PM
Bank Acc Details
Enter PIN:
1234
Enter Acc Type:
FD
Enter Amount:
10000
CREDIT
DEBIT
CHECK BALANCE
ADD ACCOUNT
VIEW ALL

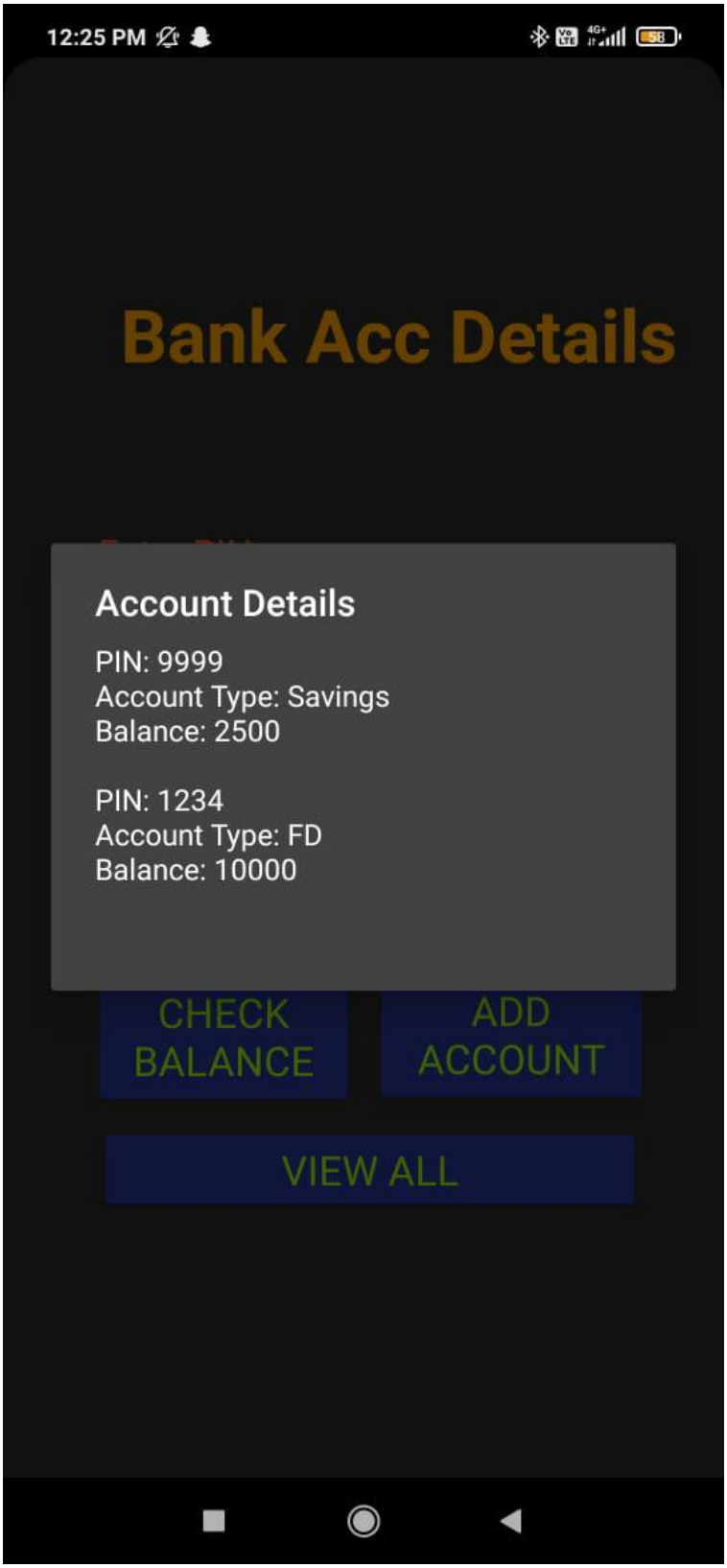


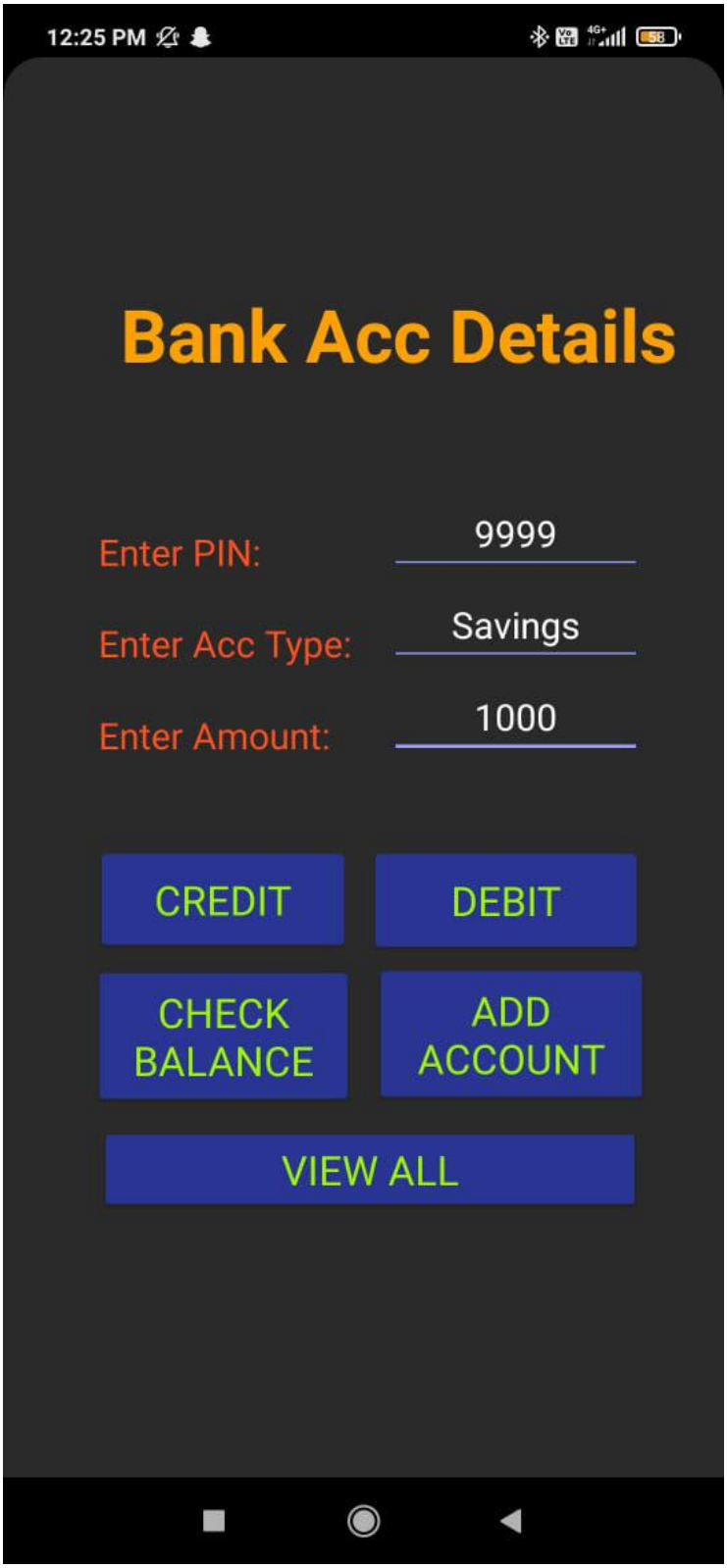
Roll No: 22102A0014

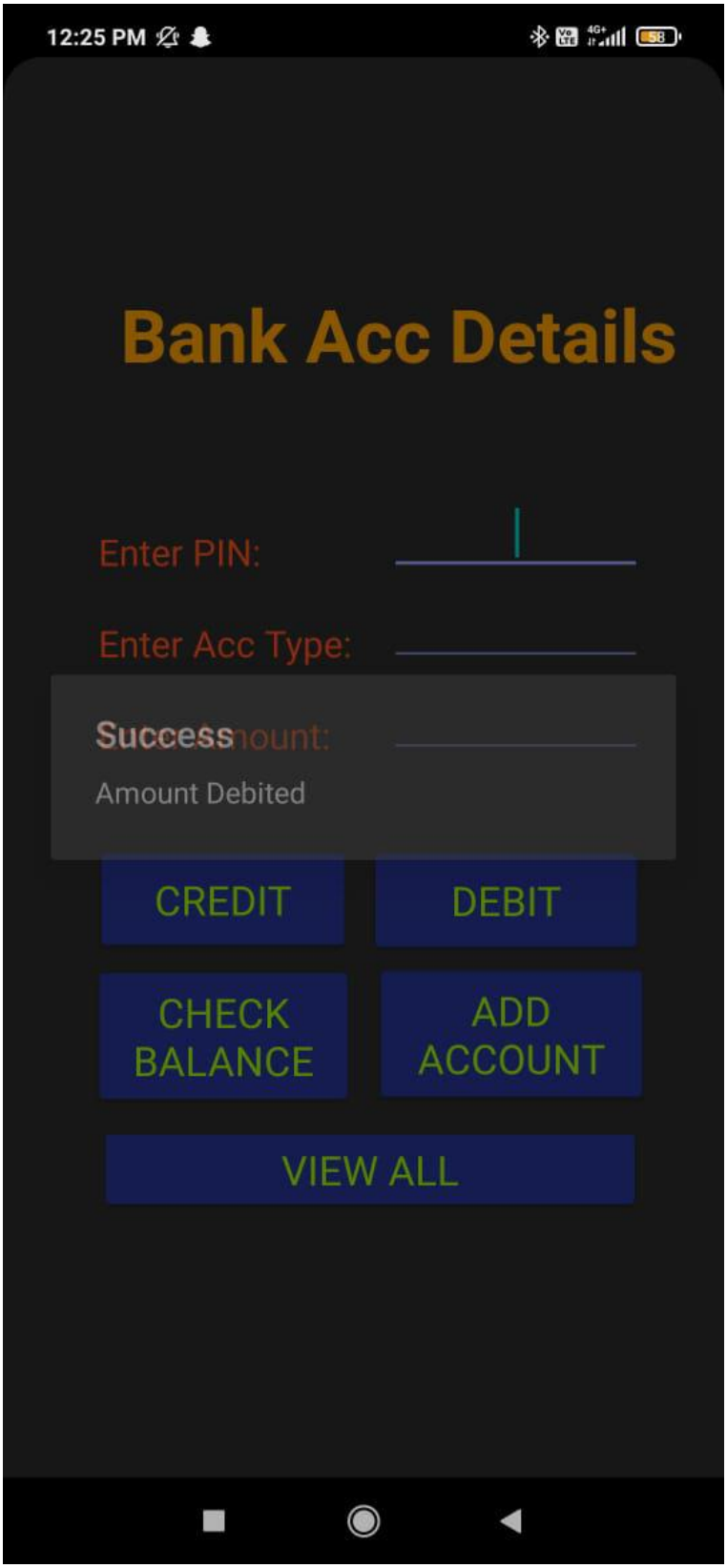

12:25 PM
Bank Acc Details
Enter PIN:
1234
Account Details
PIN: 1234
Account Type: FD
Balance: 10000
CHECK BALANCE
ADD ACCOUNT
VIEW ALL

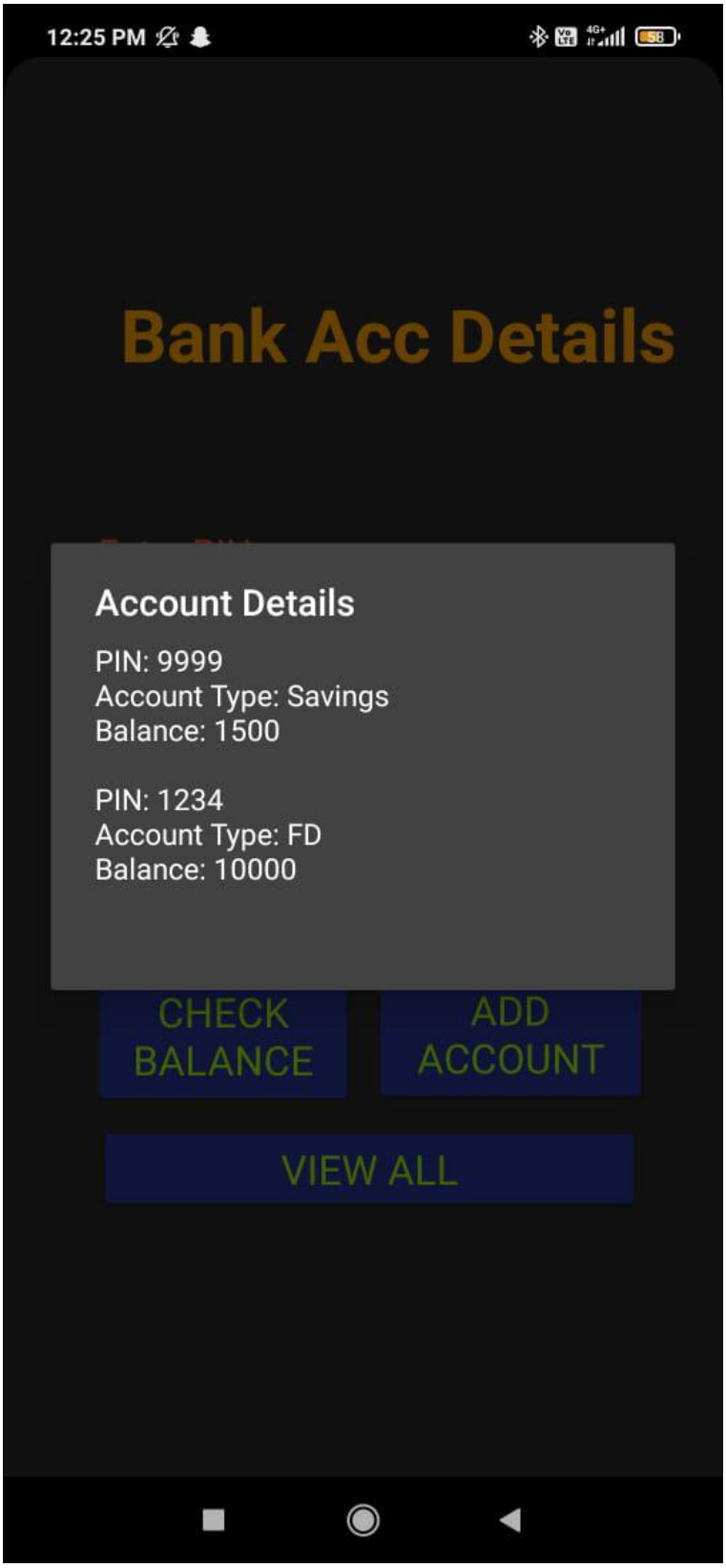

12:25 PM
Bank Acc Details
Enter PIN:
9999
Enter Acc Type:
Savings
Enter Amount:
500
CREDIT
DEBIT
CHECK BALANCE
ADD ACCOUNT
VIEW ALL


12:25 PM
Bank Acc Details
Enter PIN:
Enter Acc Type:
Success
Amount Credited
CREDIT
DEBIT
CHECK BALANCE
ADD ACCOUNT
VIEW ALL


12:25 PM
Bank Acc Details
Account Details
PIN: 9999
Account Type: Savings
Balance: 2500
PIN: 1234
Account Type: FD
Balance: 10000
CHECK BALANCE
ADD ACCOUNT
VIEW ALL


12:25 PM
Bank Acc Details
Enter PIN:
9999
Enter Acc Type:
Savings
Enter Amount:
1000
CREDIT
DEBIT
CHECK BALANCE
ADD ACCOUNT
VIEW ALL


12:25 PM
Bank Acc Details
Enter PIN:
Enter Acc Type:
Success
Amount Debited
CREDIT
DEBIT
CHECK BALANCE
ADD ACCOUNT
VIEW ALL


12:25 PM
Bank Acc Details
Account Details
PIN: 9999
Account Type: Savings
Balance: 1500
PIN: 1234
Account Type: FD
Balance: 10000
CHECK BALANCE
ADD ACCOUNT
VIEW ALL

Conclusion:

developing a student database app in Android Studio involves designing a robust database schema, implementing CRUD operations, designing a user-friendly interface, and ensuring smooth interaction between the UI and the database. Through proper testing and validation, the app can provide a seamless experience for managing student information. By following best practices and considering user feedback, developers can create a valuable tool for organizing and accessing student data efficiently.