1. **Construct a bank app to display different menu like withdraw, deposit etc**

**Xml file**

*<?*xml version="1.0" encoding="utf-8"*?>*<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Hello World!"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**Java file**

package com.example.mymenu;  
  
import androidx.annotation.NonNull;  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.os.Bundle;  
import android.view.Menu;  
import android.view.MenuItem;  
import android.widget.Toast;  
  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 }  
 @Override  
 public boolean onCreateOptionsMenu(Menu menus) {  
 getMenuInflater().inflate(R.menu.*menus*, menus);  
 return true;  
 }  
 @Override  
 public boolean onOptionsItemSelected(MenuItem item){  
 switch (item.getItemId()){  
 case R.id.*menu\_deposit*:  
 Toast.*makeText*(this,"Deposit",Toast.*LENGTH\_SHORT*).show();  
 return true;  
 case R.id.*menu\_withdraw*:  
 Toast.*makeText*(this,"Withdraw",Toast.*LENGTH\_SHORT*).show();  
 return true;  
 default:  
 return super.onOptionsItemSelected(item);  
 }  
  
 }  
 }

**menus.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<menu xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 tools:context=".MainActivity">  
<item  
 android:id="@+id/menu\_deposit"  
 android:title="Deposit"/>  
 <item  
 android:id="@+id/menu\_withdraw"  
 android:title="Withdraw"/>  
</menu>

1. **Demonstrate Options Menu, Context Menu and Popup Menu in android.**

**Xml code**

*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/textview1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Long Press For Context Menu"  
 android:textSize="18sp"  
 android:layout\_marginTop="50dp"  
 android:layout\_marginLeft="80dp"/>  
 <Button  
 android:id="@+id/btn1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Show Popup Menu"  
 android:onClick="showPopupMenu"  
 android:layout\_marginLeft="80dp"  
 android:layout\_marginTop="20dp"/>  
</LinearLayout>

**popupmenu.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<menu xmlns:android="http://schemas.android.com/apk/res/android">  
<item  
 android:id="@+id/popup1"  
 android:title="Shut Down"/>  
 <item  
 android:id="@+id/popup2"  
 android:title="Sleep"/>  
 <item  
 android:id="@+id/popup3"  
 android:title="Restart"/>  
 <item  
 android:id="@+id/popup4"  
 android:title="Update"/>  
</menu>

**contextmenu.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<menu xmlns:android="http://schemas.android.com/apk/res/android">  
<item  
 android:id="@+id/context1"  
 android:title="Paste"/>  
 <item  
 android:id="@+id/context2"  
 android:title="Copy"/>  
 <item  
 android:id="@+id/context3"  
 android:title="Referesh"/>  
 <item  
 android:id="@+id/context4"  
 android:title="Properties"/>  
</menu>

**optionmenu.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<menu xmlns:android="http://schemas.android.com/apk/res/android">  
 <item  
 android:id="@+id/option1"  
 android:title="Save"/>  
 <item  
 android:id="@+id/option2"  
 android:title="Save as"/>  
 <item  
 android:id="@+id/option3"  
 android:title="Edit"/>  
 <item  
 android:id="@+id/option4"  
 android:title="History"/>  
</menu>

**Java code**

package com.example.menu2;  
import androidx.appcompat.app.AppCompatActivity;  
import android.os.Bundle;  
import android.widget.PopupMenu;  
import android.widget.Toast;  
import android.view.ContextMenu;  
import android.view.Menu;  
import android.view.MenuItem;  
import android.view.View;  
import android.widget.TextView;  
  
public class MainActivity extends AppCompatActivity {  
 TextView textView;  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 textView = findViewById(R.id.*textview1*);  
 registerForContextMenu(textView);  
 }  
 @Override  
 public boolean onCreateOptionsMenu(Menu menu) {  
 getMenuInflater().inflate(R.menu.*optionmenu*, menu);  
 return true;  
 }  
 @Override  
 public boolean onOptionsItemSelected(MenuItem item) {  
 switch (item.getItemId()) {  
 case R.id.*option1*:  
 showToast("Save");  
 return true;  
 case R.id.*option2*:  
 showToast("Save As");  
 return true;  
 case R.id.*option3*:  
 showToast("Edit");  
 return true;  
 case R.id.*option4*:  
 showToast("History");  
 return true;  
 default:  
 return super.onOptionsItemSelected(item);  
 }  
 }  
 @Override  
 public void onCreateContextMenu(ContextMenu menu, View v, ContextMenu.ContextMenuInfo menuInfo) {  
 getMenuInflater().inflate(R.menu.*contextmenu*, menu);  
 super.onCreateContextMenu(menu, v, menuInfo);  
 }  
 @Override  
 public boolean onContextItemSelected(MenuItem item) {  
 switch (item.getItemId()) {  
 case R.id.*context1*:  
 showToast("Paste");  
 return true;  
 case R.id.*context2*:  
 showToast("Copy");  
 return true;  
 case R.id.*context3*:  
 showToast("Refresh");  
 return true;  
 case R.id.*context4*:  
 showToast("Properties");  
 return true;  
 default:  
 return super.onContextItemSelected(item);  
 }  
 }  
 public void showPopupMenu(View view) {  
 PopupMenu popupMenu = new PopupMenu(this, view);  
 popupMenu.getMenuInflater().inflate(R.menu.*popupmenu*, popupMenu.getMenu());  
  
 popupMenu.setOnMenuItemClickListener(new PopupMenu.OnMenuItemClickListener() {  
 @Override  
 public boolean onMenuItemClick(MenuItem item) {  
 switch (item.getItemId()) {  
 case R.id.*popup1*:  
 showToast("Shut Down");  
 return true;  
 case R.id.*popup2*:  
 showToast("Sleep");  
 return true;  
 case R.id.*popup3*:  
 showToast("Restart");  
 return true;  
 case R.id.*popup4*:  
 showToast("Update");  
 return true;  
 default:  
 return false;  
 }  
 }  
 });  
  
 popupMenu.show();  
 }  
 public void showToast(String message) {  
 Toast.*makeText*(this, message, Toast.*LENGTH\_SHORT*).show();  
 }  
}

1. **Demonstrate Array Adapter using List View to display list of fruits.**

**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">  
  
 <ListView  
 android:id="@+id/listView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent" />  
  
</RelativeLayout>

**Java code:**

package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.AdapterView;

import android.widget.ArrayAdapter;

import android.widget.ListView;

import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

ListView listView;

String[] fruits = {"Apple", "Banana", "Cherry", "Date", "Fig", "Grape", "Kiwi", "Lemon", "Mango", "Orange"};

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.*activity\_main*);

listView = findViewById(R.id.*listView*);

ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_list\_item\_1*, fruits);

listView.setAdapter(adapter);

listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {

@Override

public void onItemClick(AdapterView<?> parent, View view, int position, long id) {

String selectedFruit = fruits[position];

Toast.*makeText*(getApplicationContext(), "You had selected: " + selectedFruit, Toast.*LENGTH\_SHORT*).show();

}

});

}

}

**4. Construct an Android Application to accept a number and calculate Factorial and Sum of Digits of a given number using Context Menu.**

**XML code:**

*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout  
 xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp"  
 tools:context=".MainActivity"  
 android:background="#E0FFFF">  
  
 <EditText  
 android:id="@+id/numberEditText1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Enter a number"  
 android:inputType="number"  
 android:layout\_marginTop="25dp"/>  
  
 <Button  
 android:id="@+id/calculateButton1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Calculate"  
 android:layout\_marginTop="20dp"  
 android:layout\_marginLeft="100dp"/>  
  
 <TextView  
 android:id="@+id/resultTextView1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:textStyle="bold"  
 android:textColor="@color/black"  
 android:layout\_marginTop="20dp"/>  
  
  
  
</LinearLayout>

**Java code:**

package com.example.myapplication;

import android.os.Bundle;

import android.view.ContextMenu;

import android.view.MenuItem;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

EditText inputEditText;

TextView resultTextView;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.*activity\_main*);

inputEditText = findViewById(R.id.*numberEditText1*);

resultTextView = findViewById(R.id.*resultTextView1*);

Button calculateButton = findViewById(R.id.*calculateButton1*);

registerForContextMenu(resultTextView);

calculateButton.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View v) {

openContextMenu(resultTextView);

}

});

}

@Override

public void onCreateContextMenu(ContextMenu menu, View v, ContextMenu.ContextMenuInfo menuInfo) {

super.onCreateContextMenu(menu, v, menuInfo);

getMenuInflater().inflate(R.menu.*context\_menu*, menu);

}

@Override

public boolean onContextItemSelected(MenuItem item) {

int number = Integer.*parseInt*(inputEditText.getText().toString());

switch (item.getItemId()) {

case R.id.*factorialOption*:

int factorial = calculateFactorial(number);

resultTextView.setText("Factorial: " + factorial);

return true;

case R.id.*sumOfDigitsOption*:

int sumOfDigits = calculateSumOfDigits(number);

resultTextView.setText("Sum of Digits: " + sumOfDigits);

return true;

default:

return super.onContextItemSelected(item);

}

}

public int calculateFactorial(int n) {

if (n == 0) {

return 1;

} else {

return n \* calculateFactorial(n - 1);

}

}

public int calculateSumOfDigits(int n) {

int sum = 0;

while (n != 0) {

sum += n % 10;

n /= 10;

}

return sum;

}

}

**context\_menu.xml:**

*<?*xml version="1.0" encoding="utf-8"*?>*

<menu xmlns:android="http://schemas.android.com/apk/res/android">

<item

android:id="@+id/factorialOption"

android:title="Factorial" />

<item

android:id="@+id/sumOfDigitsOption"

android:title="Sum of Digits" />

</menu>

1. **Construct a register app to display different menu like add, delete, edit etc**

**XML code:**

*<?*xml version="1.0" encoding="utf-8"*?>*<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity"  
 android:background="#E0FFFF">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Register Application"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 android:textStyle="bold"  
 android:textColor="@color/black"  
 android:textSize="25sp"/>  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**Java code:**

package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.Menu;

import android.view.MenuItem;

import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.*activity\_main*);

}

@Override

public boolean onCreateOptionsMenu(Menu menu) {

getMenuInflater().inflate(R.menu.*option\_menu*, menu);

return true;

}

@Override

public boolean onOptionsItemSelected(MenuItem item) {

switch (item.getItemId()) {

case R.id.*menu\_add*:

Toast.*makeText*(this, "Add", Toast.*LENGTH\_SHORT*).show();

return true;

case R.id.*menu\_delete*:

Toast.*makeText*(this, "Delete", Toast.*LENGTH\_SHORT*).show();

return true;

case R.id.*menu\_edit*:

Toast.*makeText*(this, "Edit", Toast.*LENGTH\_SHORT*).show();

return true;

case R.id.*menu\_save*:

Toast.*makeText*(this, "Save", Toast.*LENGTH\_SHORT*).show();

return true;

case R.id.*menu\_login*:

Toast.*makeText*(this, "LogIn", Toast.*LENGTH\_SHORT*).show();

return true;

default:

return super.onOptionsItemSelected(item);

}

}

}

**option\_menu.xml:**

*<?*xml version="1.0" encoding="utf-8"*?>*

<menu xmlns:android="http://schemas.android.com/apk/res/android">

<item

android:id="@+id/menu\_add"

android:title="Add"/>

<item

android:id="@+id/menu\_delete"

android:title="Delete"/>

<item

android:id="@+id/menu\_edit"

android:title="Edit"/>

<item

android:id="@+id/menu\_save"

android:title="Save"/>

<item

android:id="@+id/menu\_login"

android:title="LogIn"/>

</menu>

**6.Demonstrate Array Adapter using List View to display list of fruits.**

**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">  
  
 <ListView  
 android:id="@+id/listView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent" />  
  
</RelativeLayout>

**Java code:**

package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.AdapterView;

import android.widget.ArrayAdapter;

import android.widget.ListView;

import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

ListView listView;

String[] fruits = {"Apple", "Banana", "Cherry", "Date", "Fig", "Grape", "Kiwi", "Lemon", "Mango", "Orange"};

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.*activity\_main*);

listView = findViewById(R.id.*listView*);

ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_list\_item\_1*, fruits);

listView.setAdapter(adapter);

listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {

@Override

public void onItemClick(AdapterView<?> parent, View view, int position, long id) {

String selectedFruit = fruits[position];

Toast.*makeText*(getApplicationContext(), "You had selected: " + selectedFruit, Toast.*LENGTH\_SHORT*).show();

}

});

}

}