**1. Create "hello world" application to display "hello world" in the middle of the screen in the emulator as well as android phone.**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:layout\_width="250dp"  
 android:layout\_height="40dp"  
 android:text="Hello World!"  
 android:textAlignment="center"  
 android:textSize="30sp"  
 android:textStyle="bold"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 tools:ignore="TextSizeCheck" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity.java**

package com.example.helloworld;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.os.Bundle;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 }  
}

**2. Create an android app to display various android lifecycle phases.**

**MainActivity.java**

package com.example.lifecycle;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.os.Bundle;  
import android.widget.Toast;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 Toast.*makeText*(getApplicationContext(), "onCreate Called", Toast.*LENGTH\_LONG*).show();  
 }  
 protected void onStart() {  
 super.onStart();  
 Toast.*makeText*(getApplicationContext(), "onStart Called", Toast.*LENGTH\_LONG*).show();  
 }  
  
 @Override  
 protected void onRestart() {  
 super.onRestart();  
 Toast.*makeText*(getApplicationContext(), "onRestart Called", Toast.*LENGTH\_LONG*).show();  
 }  
  
 protected void onResume() {  
 super.onResume();  
 Toast.*makeText*(getApplicationContext(), "onResume Called", Toast.*LENGTH\_LONG*).show();  
 }  
  
 protected void onPause() {  
 super.onPause();  
 Toast.*makeText*(getApplicationContext(), "onPause Called", Toast.*LENGTH\_LONG*).show();  
 }  
  
 protected void onStop() {  
 super.onStop();  
 Toast.*makeText*(getApplicationContext(), "onStop Called", Toast.*LENGTH\_LONG*).show();  
 }  
  
 protected void onDestroy() {  
 super.onDestroy();  
 Toast.*makeText*(getApplicationContext(), "onDestroy Called", Toast.*LENGTH\_LONG*).show();  
 }  
}

**3. Create a calculator app that performs addition, subtraction, division and multiplication operation on numbers.**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 tools:layout\_editor\_absoluteX="125dp"  
 tools:layout\_editor\_absoluteY="91dp">  
  
 <EditText  
 android:id="@+id/ed1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="70dp"  
 android:ems="10"  
 android:inputType="text"  
 android:text="Enter First Number" />  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal">  
  
 <Button  
 android:id="@+id/bt1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="+"  
 android:textStyle="bold" />  
  
 <Button  
 android:id="@+id/bt2"  
 android:layout\_width="102dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="-"  
 android:textStyle="bold" />  
  
 <Button  
 android:id="@+id/bt3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="X"  
 android:textStyle="bold" />  
  
 <Button  
 android:id="@+id/bt4"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:text="/"  
 android:textStyle="bold" />  
 </LinearLayout>  
  
 <EditText  
 android:id="@+id/ed2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="70dp"  
 android:ems="10"  
 android:inputType="text"  
 android:text="Enter Second Number" />  
  
 <Button  
 android:id="@+id/bt5"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Calculate" />  
  
 <Space  
 android:layout\_width="match\_parent"  
 android:layout\_height="25dp" />  
  
 <TextView  
 android:id="@+id/tv1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:textSize="25dp" />  
  
 </LinearLayout>  
</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity.java**

package com.example.calculator;  
  
import android.annotation.SuppressLint;  
import android.os.Bundle;  
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 Num1, Num2;  
 Button add, sub, mul, div, cal;  
 TextView Result;  
 String op= "";  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 Num1=findViewById(R.id.*ed1*);  
 Num2=findViewById(R.id.*ed2*);  
 add=findViewById(R.id.*bt1*);  
 sub=findViewById(R.id.*bt2*);  
 mul=findViewById(R.id.*bt3*);  
 div=findViewById(R.id.*bt4*);  
 cal=findViewById(R.id.*bt5*);  
 Result=findViewById(R.id.*tv1*);  
  
 add.setOnClickListener(v -> op="+");  
 sub.setOnClickListener(v -> op="-");  
 mul.setOnClickListener(v -> op="\*");  
 div.setOnClickListener(v -> op="/");  
  
 cal.setOnClickListener(new View.OnClickListener()  
 {  
 @SuppressLint("SetTextI18n")  
 @Override  
 public void onClick(View v)  
 {  
 String t1=Num1.getText().toString();  
 String t2=Num2.getText().toString();  
  
 if(!t1.isEmpty() && !t2.isEmpty())  
 {  
 float num1 = Float.*parseFloat*(t1);  
 float num2 = Float.*parseFloat*(t2);  
  
 if(op.equals("+"))  
 {  
 Result.setText(String.*format*("Result : %s", num1 + num2));  
  
 }  
 if(op.equals("-"))  
 {  
 Result.setText(String.*format*("Result : %s", num1 - num2));  
  
 }  
 if(op.equals("\*"))  
 {  
 Result.setText(String.*format*("Result : %s", num1 \* num2));  
  
 }  
 if(op.equals("/"))  
 {  
 if(num2!=0) {  
 Result.setText(String.*format*("Result : %s", num1 / num2));  
 }  
 else  
 {  
 Result.setText("Cannot divide with zero");  
 }  
  
 }  
 }  
 else{  
 Result.setText("Please enter both numbers");  
 }  
 }  
 });  
 }  
}

**4. Write an Android application to convert into different currencies for example, Rupees to dollar**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical">  
  
 <Spinner  
 android:id="@+id/spinnerFromCurrency"  
 android:layout\_width="match\_parent"  
 android:layout\_height="64dp"  
 android:layout\_below="@id/etAmount" />  
  
 <EditText  
 android:id="@+id/etAmount"  
 android:layout\_width="match\_parent"  
 android:layout\_height="69dp"  
 android:hint="Enter Amount"  
 android:inputType="numberDecimal" />  
  
 <Spinner  
 android:id="@+id/spinnerToCurrency"  
 android:layout\_width="match\_parent"  
 android:layout\_height="55dp"  
 android:layout\_below="@id/spinnerFromCurrency" />  
  
 <Button  
 android:id="@+id/btnConvert"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_below="@id/spinnerToCurrency"  
 android:layout\_centerHorizontal="true"  
 android:text="Convert" />  
  
 <TextView  
 android:id="@+id/tvResult"  
 android:layout\_width="match\_parent"  
 android:layout\_height="48dp"  
 android:layout\_below="@id/btnConvert"  
 android:layout\_centerHorizontal="true"  
 android:text=""  
 android:textSize="20sp" />  
 </LinearLayout>  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity.java**

package com.example.first\_app;  
  
import android.os.Bundle;  
import android.view.View;  
import android.widget.ArrayAdapter;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.Spinner;  
import android.widget.TextView;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
  
 EditText etAmount;  
 Spinner spinnerFromCurrency, spinnerToCurrency;  
 Button btnConvert;  
 TextView tvResult;  
  
 private static final String[] *CURRENCIES* = {"Rupees", "Dollar", "Euro"};  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 etAmount = findViewById(R.id.*etAmount*);  
 spinnerFromCurrency = findViewById(R.id.*spinnerFromCurrency*);  
 spinnerToCurrency = findViewById(R.id.*spinnerToCurrency*);  
 btnConvert = findViewById(R.id.*btnConvert*);  
 tvResult = findViewById(R.id.*tvResult*);  
  
 ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.*simple\_spinner\_item*, *CURRENCIES*);  
 adapter.setDropDownViewResource(android.R.layout.*simple\_spinner\_dropdown\_item*);  
 spinnerFromCurrency.setAdapter(adapter);  
 spinnerToCurrency.setAdapter(adapter);  
  
 btnConvert.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 convertCurrency();  
 }  
 });  
 }  
  
 private void convertCurrency() {  
 String amountStr = etAmount.getText().toString().trim();  
 if (amountStr.isEmpty()) {  
 tvResult.setText("Please enter an amount");  
 }  
 else {  
 double amount = Double.*parseDouble*(amountStr);  
 String fromRate = spinnerFromCurrency.getSelectedItem().toString();  
 String toRate = spinnerToCurrency.getSelectedItem().toString();  
 double result = 0;  
  
 if(fromRate.equals("Rupees")) {  
 if (toRate.equals("Dollar")) {  
 result = amount\*0.012;  
 }  
 else if (toRate.equals("Euro")) {  
 result = amount\*0.011;  
 }  
 else{  
 result=amount;  
 }  
 }  
 else if (fromRate.equals("Dollar")) {  
 if (toRate.equals("Rupees")) {  
 result = amount\*83.38;  
 }  
 else if (toRate.equals("Euro")) {  
 result = amount\*0.93;  
 }  
 else{  
 result=amount;  
 }  
 }  
 else if (fromRate.equals("Euro")) {  
 if (toRate.equals("Dollar")) {  
 result = amount\*1.07;  
 }  
 else if (toRate.equals("Rupees")) {  
 result = amount\*89.50;  
 }  
 else{  
 result=amount;  
 }  
 }  
  
// double result = (amount / fromRate) \* toRate;  
 tvResult.setText(String.*format*("%.2f", result));  
 }  
  
 }  
}

**5. Create a spinner application with strings taken from resource directory res/values/strings.xml and on changing the spinner value, image will change. Image is saved in the drawable directory.**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <ImageView  
 android:id="@+id/backgroundImageView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="0dp"  
 android:scaleType="centerCrop"  
 android:src="@drawable/ic\_launcher\_background"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 tools:ignore="ContentDescription" />  
  
 <Spinner  
 android:id="@+id/spinner1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_centerInParent="true"  
 android:entries="@array/S"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="@+id/backgroundImageView" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity.xml**

package com.example.image;  
  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.os.Bundle;  
import android.view.View;  
import android.widget.AdapterView;  
import android.widget.ImageView;  
import android.widget.Spinner;  
import android.widget.Toast;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 Spinner spinner = findViewById(R.id.*spinner1*);  
 ImageView backgroundImageView = findViewById(R.id.*backgroundImageView*);  
 spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {  
 @Override  
 public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {  
 String selectedItem = adapterView.getItemAtPosition(i).toString();  
 Toast.*makeText*(getApplicationContext(), selectedItem, Toast.*LENGTH\_SHORT*).show();  
  
 // Load different images based on the selected item  
 switch (selectedItem) {  
 case "Image 1":  
 backgroundImageView.setImageResource(R.drawable.*a*);  
 break;  
 case "Image 2":  
 backgroundImageView.setImageResource(R.drawable.*b*);  
 break;  
 case "Image 3":  
 backgroundImageView.setImageResource(R.drawable.*c*);  
 break;  
 case "Image 4":  
 backgroundImageView.setImageResource(R.drawable.*d*);  
 break;  
 default:  
 // Handle default case or do nothing  
 break;  
 }  
 }  
  
 @Override  
 public void onNothingSelected(AdapterView<?> adapterView) {  
  
 }  
 });  
 }  
}

**6. Create an app that uses radio button group which calculates discount on shopping bill amount. Use edittext to enter bill amount and select one of three radio buttons to determine a discount for 10, 15, or 20 percent. the discount is calculated upon selection of one of the buttons and displayed in a textview control.**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 tools:context=".MainActivity">  
  
 <LinearLayout  
 android:layout\_width="409dp"  
 android:layout\_height="729dp"  
 android:orientation="vertical"  
 tools:layout\_editor\_absoluteX="1dp"  
 tools:layout\_editor\_absoluteY="1dp"  
 tools:ignore="MissingConstraints">  
  
 <TextView  
 android:id="@+id/tv1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="51dp"  
 android:text="Bill Calculator"  
 android:textAlignment="center"  
 android:textSize="30sp"  
 android:textStyle="bold"  
 tools:ignore="TextSizeCheck" />  
  
 <EditText  
 android:id="@+id/ed1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:ems="10"  
 android:hint="Enter Amount"  
 android:inputType="text"  
 android:textSize="26sp" />  
  
 <com.google.android.material.textfield.TextInputLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"/>  
  
 <TextView  
 android:id="@+id/tv2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Choose Discount"  
 android:textSize="24sp"  
 tools:text="Choose Discount" />  
  
 <RadioGroup  
 android:id="@+id/rg1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content">  
  
 <RadioButton  
 android:id="@+id/r1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="10%"  
 android:textSize="16sp"  
 android:textStyle="bold" />  
  
 <RadioButton  
 android:id="@+id/r2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="15%"  
 android:textSize="16sp"  
 android:textStyle="bold" />  
  
 <RadioButton  
 android:id="@+id/r3"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="20%"  
 android:textSize="16sp"  
 android:textStyle="bold" />  
 </RadioGroup>  
  
 <Button  
 android:id="@+id/b1"  
 android:layout\_width="match\_parent"  
 android:layout\_height="50dp"  
 android:text="Calculate"  
 android:textSize="20sp"  
 android:textStyle="bold" />  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal">  
  
 <TextView  
 android:id="@+id/tv4"  
 android:layout\_width="180dp"  
 android:layout\_height="match\_parent"  
 android:text="Total Amount :"  
 android:textAlignment="center"  
 android:textSize="24sp" />  
  
 <TextView  
 android:id="@+id/tv3"  
 android:layout\_width="match\_parent"  
 android:layout\_height="47dp"  
 android:textAlignment="center"  
 android:textSize="24sp" />  
 </LinearLayout>  
  
 </LinearLayout>  
</androidx.constraintlayout.widget.ConstraintLayout>

MainActivity.java

package com.example.bill;  
  
import android.os.Bundle;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.TextView;  
import android.widget.RadioButton;  
import android.widget.RadioGroup;  
import android.view.View;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
 EditText amt;  
 Button cal;  
 RadioGroup rg;  
 RadioButton rb1, rb2, rb3;  
 TextView total;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 amt = findViewById(R.id.*ed1*);  
 cal = findViewById(R.id.*b1*);  
 rg = findViewById(R.id.*rg1*);  
 rb1=findViewById(R.id.*r1*);  
 rb2=findViewById(R.id.*r2*);  
 rb3=findViewById(R.id.*r3*);  
 total = findViewById(R.id.*tv3*);  
  
 cal.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 calculate();  
 }  
 });  
 }  
  
 private void calculate()  
 {  
 double Amount = Double.*parseDouble*(amt.getText().toString());  
 int rid = rg.getCheckedRadioButtonId();  
 double Total;  
 if(Amount>0)  
 {  
 if(rid != -1)  
 {  
 RadioButton selected = findViewById(rid);  
 String discount = selected.getText().toString();  
  
 switch (discount) {  
 case "10%":  
 Total = Amount \* 0.9;  
 total.setText(String.*format*("%.2f", Total));  
 break;  
 case "15%":  
 Total = Amount \* 0.85;  
 total.setText(String.*format*("%.2f", Total));  
 break;  
 case "20%":  
 Total = Amount \* 0.8;  
 total.setText(String.*format*("%.2f", Total));  
 break;  
 }  
  
 }  
 else{  
 total.setText("Please select a discount");  
 }  
  
 }  
 else  
 {  
 total.setText("Please enter an amount");  
 }  
 }  
}

**7. Create an application that uses checkbox for construction of a shopping list so the user can check off items as they are picked up. The checked items should be displayed in a textview control.**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Shopping List"  
 android:textSize="24sp"  
 android:textStyle="bold"  
 android:layout\_gravity="center\_horizontal"  
 android:layout\_marginBottom="16dp"/>  
  
 <CheckBox  
 android:id="@+id/checkBox\_item1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:checked="false"  
 android:text="MILK" />  
  
 <CheckBox  
 android:id="@+id/checkBox\_item2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:checked="false"  
 android:text="EGG" />  
  
 <CheckBox  
 android:id="@+id/checkBox\_item3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:checked="false"  
 android:text="BREAD" />  
  
 <Button  
 android:id="@+id/button\_display\_items"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Display Checked Items"  
 android:layout\_gravity="center\_horizontal"  
 android:layout\_marginTop="16dp"/>  
  
 <TextView  
 android:id="@+id/textView\_display"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center\_horizontal"  
 android:layout\_marginTop="16dp"  
 android:hint="Your items"  
 android:textSize="18sp" />  
  
 </LinearLayout>  
  
  
</androidx.constraintlayout.widget.ConstraintLayout>

MainActivity.java

package com.example.checklist;  
  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.CheckBox;  
import android.widget.TextView;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
  
 CheckBox checkBoxItem1, checkBoxItem2, checkBoxItem3;  
 Button buttonDisplayItems;  
 TextView textViewDisplay;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 checkBoxItem1 = findViewById(R.id.*checkBox\_item1*);  
 checkBoxItem2 = findViewById(R.id.*checkBox\_item2*);  
 checkBoxItem3 = findViewById(R.id.*checkBox\_item3*);  
 buttonDisplayItems = findViewById(R.id.*button\_display\_items*);  
 textViewDisplay = findViewById(R.id.*textView\_display*);  
  
 buttonDisplayItems.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 displayCheckedItems();  
 }  
 });  
 }  
  
 private void displayCheckedItems() {  
 StringBuilder result = new StringBuilder("Checked Items:\n");  
  
 if (checkBoxItem1.isChecked()) {  
 result.append("MILK - 10 Rs.\n");  
 }  
 if (checkBoxItem2.isChecked()) {  
 result.append("EGGS - 20 Rs.\n");  
 }  
 if (checkBoxItem3.isChecked()) {  
 result.append("BREAD - 30 Rs.\n\n");  
 }  
  
 int totalAmount = 0;  
 if (checkBoxItem1.isChecked()) {  
 totalAmount += 10;  
 }  
 if (checkBoxItem2.isChecked()) {  
 totalAmount += 20;  
 }  
 if (checkBoxItem3.isChecked()) {  
 totalAmount += 30;  
 }  
  
 result.append("Total Amount: Rs." + totalAmount);  
  
 textViewDisplay.setText(result.toString());  
 }  
}

**8. Create a login application to verify username and password. On successful login, redirect to another activity that has a textview to display "welcome user" with logout button. On click of logout button, a dialog should appear with ok and cancel buttons. On click of oK button, go back to the login activity and on click of cancel button, stay on the same activity.**

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <EditText  
 android:id="@+id/etUsername"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Username" />  
  
 <EditText  
 android:id="@+id/etPassword"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Password"  
 android:inputType="textPassword" />  
  
 <Button  
 android:id="@+id/btnLogin"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Login" />  
  
</LinearLayout>

**MainActivity.java**

// MainActivity.java  
package com.example.loginapp;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.Toast;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
  
 private EditText etUsername;  
 private EditText etPassword;  
 private Button btnLogin;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 etUsername = findViewById(R.id.*etUsername*);  
 etPassword = findViewById(R.id.*etPassword*);  
 btnLogin = findViewById(R.id.*btnLogin*);  
  
 btnLogin.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 String username = etUsername.getText().toString();  
 String password = etPassword.getText().toString();  
  
 if (username.equals("user") && password.equals("password")) {  
 Intent intent = new Intent(MainActivity.this, WelcomeActivity.class);  
 intent.putExtra("username", username);  
 startActivity(intent);  
 finish();  
 } else {  
 Toast.*makeText*(MainActivity.this, "Invalid username or password", Toast.*LENGTH\_SHORT*).show();  
 }  
 }  
 });  
 }  
}

**activity\_welcome.xml**

<?xml version="1.0" encoding="utf-8"?>  
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <TextView  
 android:id="@+id/tvWelcome"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Welcome"  
 android:textSize="24sp"  
 android:layout\_gravity="center\_horizontal"  
 android:padding="16dp"/>  
  
 <Button  
 android:id="@+id/btnLogout"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Logout" />  
  
</LinearLayout>

**WelcomeActivity.java**

// WelcomeActivity.java  
package com.example.loginapp;  
  
import android.content.DialogInterface;  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.TextView;  
import androidx.appcompat.app.AlertDialog;  
import androidx.appcompat.app.AppCompatActivity;  
  
public class WelcomeActivity extends AppCompatActivity {  
  
 private TextView tvWelcome;  
 private Button btnLogout;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_welcome*);  
  
 tvWelcome = findViewById(R.id.*tvWelcome*);  
 btnLogout = findViewById(R.id.*btnLogout*);  
  
 String username = getIntent().getStringExtra("username");  
 tvWelcome.setText("Welcome " + username);  
  
 btnLogout.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 showLogoutDialog();  
 }  
 });  
 }  
  
 private void showLogoutDialog() {  
 new AlertDialog.Builder(this)  
 .setTitle("Logout")  
 .setMessage("Are you sure you want to logout?")  
 .setPositiveButton("OK", new DialogInterface.OnClickListener() {  
 @Override  
 public void onClick(DialogInterface dialog, int which) {  
 Intent intent = new Intent(WelcomeActivity.this, MainActivity.class);  
 startActivity(intent);  
 finish();  
 }  
 })  
 .setNegativeButton("Cancel", null)  
 .show();  
 }  
}

**Q9. Write an android application to convert a ball from size of radius 2(colour red) to radius**

**4(colour blue) to radius 6 (colour green). The ball must rotate in circle for 1 minute before**

**changing size and colour.**

**BallView.java**

package com.example.loginapp;  
  
import android.content.Context;  
import android.graphics.Canvas;  
import android.graphics.Color;  
import android.graphics.Paint;  
import android.util.AttributeSet;  
import android.view.View;  
  
public class BallView extends View {  
 private Paint paint;  
 private float radius;  
 private int color;  
 private float angle;  
  
 public BallView(Context context, AttributeSet attrs) {  
 super(context, attrs);  
 init();  
 }  
  
 public BallView(Context context) {  
 super(context);  
 init();  
 }  
  
 private void init() {  
 paint = new Paint(Paint.*ANTI\_ALIAS\_FLAG*);  
 radius = 2;  
 color = Color.*RED*;  
 angle = 0;  
 }  
  
 @Override  
 protected void onDraw(Canvas canvas) {  
 super.onDraw(canvas);  
 paint.setColor(color);  
  
 // Calculate the position of the ball in a circular path  
 float centerX = getWidth() / 2;  
 float centerY = getHeight() / 2;  
 float x = centerX + (float) (Math.*cos*(Math.*toRadians*(angle)) \* centerX / 2);  
 float y = centerY + (float) (Math.*sin*(Math.*toRadians*(angle)) \* centerY / 2);  
  
 canvas.drawCircle(x, y, radius \* 20, paint);  
 }  
  
 public void setRadius(float radius) {  
 this.radius = radius;  
 invalidate();  
 }  
  
 public void setColor(int color) {  
 this.color = color;  
 invalidate();  
 }  
  
 public void setAngle(float angle) {  
 this.angle = angle;  
 invalidate();  
 }  
}

**MainActivity2.java**

package com.example.loginapp;  
  
import android.animation.AnimatorSet;  
import android.animation.ObjectAnimator;  
import android.graphics.Color;  
import android.os.Bundle;  
import android.widget.FrameLayout;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity2 extends AppCompatActivity {  
  
 private BallView ballView;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
  
 ballView = new BallView(this);  
 FrameLayout.LayoutParams params = new FrameLayout.LayoutParams(  
 FrameLayout.LayoutParams.*MATCH\_PARENT*,  
 FrameLayout.LayoutParams.*MATCH\_PARENT* );  
 setContentView(ballView, params);  
  
 startAnimation();  
 }  
  
 private void startAnimation() {  
 // Animation to rotate the ball  
 ObjectAnimator rotateAnimator = ObjectAnimator.*ofFloat*(ballView, "angle", 0, 360);  
 rotateAnimator.setDuration(60000); // 1 minute  
 rotateAnimator.setRepeatCount(ObjectAnimator.*INFINITE*);  
  
 // Animations to change size and color  
 ObjectAnimator sizeAnimator1 = ObjectAnimator.*ofFloat*(ballView, "radius", 2, 4);  
 sizeAnimator1.setDuration(60000); // 1 minute  
 ObjectAnimator sizeAnimator2 = ObjectAnimator.*ofFloat*(ballView, "radius", 4, 6);  
 sizeAnimator2.setDuration(60000); // 1 minute  
  
 ObjectAnimator colorAnimator1 = ObjectAnimator.*ofArgb*(ballView, "color", Color.*RED*, Color.*BLUE*);  
 colorAnimator1.setDuration(60000); // 1 minute  
 ObjectAnimator colorAnimator2 = ObjectAnimator.*ofArgb*(ballView, "color", Color.*BLUE*, Color.*GREEN*);  
 colorAnimator2.setDuration(60000); // 1 minute  
  
 // Animator set to chain the size and color animations  
 AnimatorSet sizeColorSet1 = new AnimatorSet();  
 sizeColorSet1.play(sizeAnimator1).with(colorAnimator1);  
  
 AnimatorSet sizeColorSet2 = new AnimatorSet();  
 sizeColorSet2.play(sizeAnimator2).with(colorAnimator2).after(sizeColorSet1);  
  
 // Start animations  
 rotateAnimator.start();  
 sizeColorSet2.start();  
 }  
}

**Q10. Create an application to perform the operations of create, insert, delete, view and update,**

**using sqlite database.**

**DatabaseHelper.java**

import android.content.Context;  
import android.database.sqlite.SQLiteDatabase;  
import android.database.sqlite.SQLiteOpenHelper;  
  
public class DatabaseHelper extends SQLiteOpenHelper {  
  
 private static final String *DATABASE\_NAME* = "userdb";  
 private static final int *DATABASE\_VERSION* = 1;  
  
 public static final String *TABLE\_USERS* = "users";  
 public static final String *COLUMN\_ID* = "id";  
 public static final String *COLUMN\_NAME* = "name";  
 public static final String *COLUMN\_EMAIL* = "email";  
  
 private static final String *TABLE\_CREATE* =  
 "CREATE TABLE " + *TABLE\_USERS* + " (" +  
 *COLUMN\_ID* + " INTEGER PRIMARY KEY AUTOINCREMENT, " +  
 *COLUMN\_NAME* + " TEXT, " +  
 *COLUMN\_EMAIL* + " TEXT" +  
 ");";  
  
 public DatabaseHelper(Context context) {  
 super(context, *DATABASE\_NAME*, null, *DATABASE\_VERSION*);  
 }  
  
 @Override  
 public void onCreate(SQLiteDatabase db) {  
 db.execSQL(*TABLE\_CREATE*);  
 }  
  
 @Override  
 public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {  
 db.execSQL("DROP TABLE IF EXISTS " + *TABLE\_USERS*);  
 onCreate(db);  
 }  
}

**User.java**

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

**userDAO.java**

import android.content.ContentValues;  
import android.content.Context;  
import android.database.Cursor;  
import android.database.SQLException;  
import android.database.sqlite.SQLiteDatabase;  
  
import java.util.ArrayList;  
import java.util.List;  
  
public class UserDAO {  
 private SQLiteDatabase database;  
 private DatabaseHelper dbHelper;  
 private String[] allColumns = {DatabaseHelper.*COLUMN\_ID*, DatabaseHelper.*COLUMN\_NAME*, DatabaseHelper.*COLUMN\_EMAIL*};  
  
 public UserDAO(Context context) {  
 dbHelper = new DatabaseHelper(context);  
 }  
  
 public void open() throws SQLException {  
 database = dbHelper.getWritableDatabase();  
 }  
  
 public void close() {  
 dbHelper.close();  
 }  
  
 public User createUser(String name, String email) {  
 ContentValues values = new ContentValues();  
 values.put(DatabaseHelper.*COLUMN\_NAME*, name);  
 values.put(DatabaseHelper.*COLUMN\_EMAIL*, email);  
 long insertId = database.insert(DatabaseHelper.*TABLE\_USERS*, null, values);  
 Cursor cursor = database.query(DatabaseHelper.*TABLE\_USERS*,  
 allColumns, DatabaseHelper.*COLUMN\_ID* + " = " + insertId, null,  
 null, null, null);  
 cursor.moveToFirst();  
 User newUser = cursorToUser(cursor);  
 cursor.close();  
 return newUser;  
 }  
  
 public void deleteUser(User user) {  
 long id = user.getId();  
 database.delete(DatabaseHelper.*TABLE\_USERS*, DatabaseHelper.*COLUMN\_ID* + " = " + id, null);  
 }  
  
 public List<User> getAllUsers() {  
 List<User> users = new ArrayList<>();  
 Cursor cursor = database.query(DatabaseHelper.*TABLE\_USERS*,  
 allColumns, null, null, null, null, null);  
 cursor.moveToFirst();  
 while (!cursor.isAfterLast()) {  
 User user = cursorToUser(cursor);  
 users.add(user);  
 cursor.moveToNext();  
 }  
 cursor.close();  
 return users;  
 }  
  
 public User updateUser(long id, String name, String email) {  
 ContentValues values = new ContentValues();  
 values.put(DatabaseHelper.*COLUMN\_NAME*, name);  
 values.put(DatabaseHelper.*COLUMN\_EMAIL*, email);  
 database.update(DatabaseHelper.*TABLE\_USERS*, values, DatabaseHelper.*COLUMN\_ID* + " = " + id, null);  
 Cursor cursor = database.query(DatabaseHelper.*TABLE\_USERS*,  
 allColumns, DatabaseHelper.*COLUMN\_ID* + " = " + id, null,  
 null, null, null);  
 cursor.moveToFirst();  
 User updatedUser = cursorToUser(cursor);  
 cursor.close();  
 return updatedUser;  
 }  
  
 private User cursorToUser(Cursor cursor) {  
 User user = new User();  
 user.setId(cursor.getLong(0));  
 user.setName(cursor.getString(1));  
 user.setEmail(cursor.getString(2));  
 return user;  
 }  
}

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity3">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <EditText  
 android:id="@+id/editTextName"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Name" />  
  
 <EditText  
 android:id="@+id/editTextEmail"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Email" />  
  
 <EditText  
 android:id="@+id/editTextId"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="ID (for Update/Delete)"  
 android:inputType="number" />  
  
 <Button  
 android:id="@+id/buttonAdd"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Add" />  
  
 <Button  
 android:id="@+id/buttonDelete"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Delete" />  
  
 <Button  
 android:id="@+id/buttonUpdate"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="Update" />  
  
 <Button  
 android:id="@+id/buttonView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="View All" />  
  
 <ListView  
 android:id="@+id/listViewUsers"  
 android:layout\_width="match\_parent"  
 android:layout\_height="0dp"  
 android:layout\_weight="1" />  
 </LinearLayout>  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity3.java**

package com.example.loginapp;  
  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.ListView;  
import android.widget.SimpleAdapter;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import java.util.ArrayList;  
import java.util.HashMap;  
import java.util.List;  
  
public class MainActivity3 extends AppCompatActivity {  
  
 private UserDAO userDAO;  
 private EditText editTextName, editTextEmail, editTextId;  
 private Button buttonAdd, buttonDelete, buttonUpdate, buttonView;  
 private ListView listViewUsers;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main3*);  
  
 userDAO = new UserDAO(this);  
 userDAO.open();  
  
 editTextName = findViewById(R.id.*editTextName*);  
 editTextEmail = findViewById(R.id.*editTextEmail*);  
 editTextId = findViewById(R.id.*editTextId*);  
 buttonAdd = findViewById(R.id.*buttonAdd*);  
 buttonDelete = findViewById(R.id.*buttonDelete*);  
 buttonUpdate = findViewById(R.id.*buttonUpdate*);  
 buttonView = findViewById(R.id.*buttonView*);  
 listViewUsers = findViewById(R.id.*listViewUsers*);  
  
 buttonAdd.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 String name = editTextName.getText().toString();  
 String email = editTextEmail.getText().toString();  
 userDAO.createUser(name, email);  
 viewAllUsers();  
 }  
 });  
  
 buttonDelete.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 long id = Long.*parseLong*(editTextId.getText().toString());  
 User user = new User();  
 user.setId(id);  
 userDAO.deleteUser(user);  
 viewAllUsers();  
 }  
 });  
  
 buttonUpdate.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 long id = Long.*parseLong*(editTextId.getText().toString());  
 String name = editTextName.getText().toString();  
 String email = editTextEmail.getText().toString();  
 userDAO.updateUser(id, name, email);  
 viewAllUsers();  
 }  
 });  
  
 buttonView.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 viewAllUsers();  
 }  
 });  
  
 // Initially load all users  
 viewAllUsers();  
 }  
  
 private void viewAllUsers() {  
 List<User> users = userDAO.getAllUsers();  
 List<HashMap<String, String>> userMaps = new ArrayList<>();  
  
 for (User user : users) {  
 HashMap<String, String> map = new HashMap<>();  
 map.put("id", String.*valueOf*(user.getId()));  
 map.put("name", user.getName());  
 map.put("email", user.getEmail());  
 userMaps.add(map);  
 }  
  
 SimpleAdapter adapter = new SimpleAdapter(this, userMaps, android.R.layout.*simple\_list\_item\_2*,  
 new String[]{"name", "email"}, new int[]{android.R.id.*text1*, android.R.id.*text2*});  
 listViewUsers.setAdapter(adapter);  
 }  
  
 @Override  
 protected void onDestroy() {  
 super.onDestroy();  
 userDAO.close();  
 }  
}