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) {  
  
 }  
 });  
 }  
}