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1.Write an android code to turn ON/OFF Bluetooth

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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/btn1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Bluetooth ON"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.307"
        app:layout_editor_absoluteX="139dp" />

    <Button
        android:id="@+id/btn2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Bluetooth OFF"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_editor_absoluteX="139dp" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.bluetooth;

import static android.os.Build.VERSION_CODES.R;

import android.annotation.SuppressLint;
import android.bluetooth.BluetoothAdapter;
```

```
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

import androidx.activity.EdgeToEdge;
import androidx.activity.result.ActivityResultLauncher;
import androidx.activity.result.contract.ActivityResultContracts;
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 {

    private Button b1, b2;
    private ActivityResultLauncher<Intent> bluetoothActivityResultLauncher;

    @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;
        });

        b1 = findViewById(R.id.btn1);
        b2 = findViewById(R.id.btn2);
        BluetoothAdapter btn = BluetoothAdapter.getDefaultAdapter();


        bluetoothActivityResultLauncher = registerForActivityResult(
                new ActivityResultContracts.StartActivityForResult(),
                result -> {
                    if (result.getResultCode() == RESULT_OK) {
                        Toast.makeText(getApplicationContext(), "Bluetooth is enabled",
Toast.LENGTH_SHORT).show();
                    } else {
                        Toast.makeText(getApplicationContext(), "Bluetooth enabling canceled",
Toast.LENGTH_SHORT).show();
                    }
```

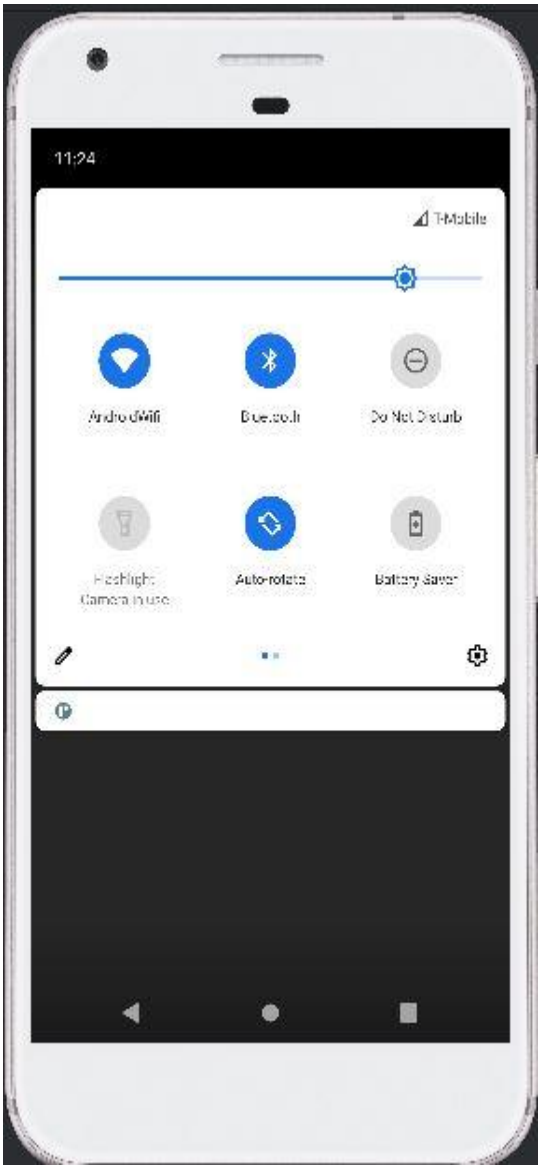
```
            }
        );

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                if (btn == null) {
                    Toast.makeText(getApplicationContext(), "Bluetooth not supported",
Toast.LENGTH_SHORT).show();
                } else {
                    if (!btn.isEnabled()) {
                        Intent enableBtIntent = new
Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
                        bluetoothActivityResultLauncher.launch(enableBtIntent);
                    }
                    else {
                        Toast.makeText(MainActivity.this, "Bluetooth is already on",
Toast.LENGTH_SHORT).show();
                    }
                }
            }
        });

        b2.setOnClickListener(new View.OnClickListener() {
            @SuppressLint("MissingPermission")
            @Override
            public void onClick(View view) {
                if (btn == null) {
                    Toast.makeText(getApplicationContext(), "Bluetooth not supported",
Toast.LENGTH_SHORT).show();
                } else {
                    if (btn.isEnabled()) {
                        btn.disable();
                        Toast.makeText(getApplicationContext(), "Bluetooth is disabled",
Toast.LENGTH_SHORT).show();
                    }
                    else {
                        Toast.makeText(MainActivity.this, "Bluetooth is already off",
Toast.LENGTH_SHORT).show();
                    }
                }
            }
        });

        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;
      });
    }
}
//API 30
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <uses-permission android:name="android.permission.BLUETOOTH_CONNECT" />
    <uses-permission
android:name="android.permission.ACCESS_COARSE_LOCATION"/>
    <uses-permission android:name="android.permission.BLUETOOTH"/>
    <uses-permission android:name="android.permission.BLUETOOTH_ADMIN"/>
    <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.Bluetooth"
        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:-



2. Write an android code to turn ON /OFF the Wi-Fi.

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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">


    <Button
        android:id="@+id/btn1"
        android:layout_width="190dp"
        android:layout_height="77dp"
        android:text="On"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintHorizontal_bias="0.495"
        app:layout_constraintVertical_bias="0.398" />

    <Button
        android:id="@+id/btn2"
        android:layout_width="184dp"
        android:layout_height="84dp"
        android:text="Off"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.484"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.607" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.wifi;
import android.annotation.SuppressLint;
import android.content.Context;
```

```
import android.net.wifi.WifiManager;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import android.view.View.OnClickListener;
import kotlin.Suppress;

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 {

    Button b1,b2;
    @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;
        });
        b1=(Button)findViewById(R.id.btn1);
        b2=(Button)findViewById(R.id.btn2);
        b1.setOnClickListener(v -> {
            WifiManager wifi = (WifiManager) getSystemService(Context.WIFI_SERVICE);
            wifi.setWifiEnabled(true);
            Toast.makeText(this, "Wifi Turned On", Toast.LENGTH_SHORT).show();
        });

        b2.setOnClickListener(v -> {
            WifiManager wifi = (WifiManager) getSystemService(Context.WIFI_SERVICE);
            wifi.setWifiEnabled(false);
            Toast.makeText(this, "Wifi Turned Off", Toast.LENGTH_SHORT).show();
        });
    }
}
```

//API 27

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <uses-permission android:name="android.permission.ACCESS_WIFI_STATE" />
    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="android.permission.CHANGE_WIFI_STATE"/>
    <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.WiFi"
        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:-

3. Write an android code to make phone call using Intent.

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:padding="16dp">

<EditText
   android:id="@+id/phoneNumberEditText"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:hint="Enter phone number"
   android:layout_marginTop="35dp"
   android:inputType="phone" />

   <Button
      android:id="@+id/callButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_below="@id/phoneNumberEditText"
      android:layout_marginHorizontal="145dp"
      android:layout_marginTop="35dp"
      android:text="Call" />

</RelativeLayout>
```

MainActivity.java

```
package com.example.phonecall;
import android.Manifest;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

public class MainActivity extends AppCompatActivity {

   private static final int REQUEST_CALL_PERMISSION = 1;
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        final EditText phoneNumberEditText = findViewById(R.id.phoneNumberEditText);
        Button callButton = findViewById(R.id.callButton);

        callButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String phoneNumber = phoneNumberEditText.getText().toString();
                if (!phoneNumber.isEmpty()) {
                    makePhoneCall(phoneNumber);
                }
            }
        });
    }

    private void makePhoneCall(String phoneNumber) {
        if (ContextCompat.checkSelfPermission(this, Manifest.permission.CALL_PHONE) !=
PackageManager.PERMISSION_GRANTED) {
            ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.CALL_PHONE}, REQUEST_CALL_PERMISSION);
        } else {
            Intent intent = new Intent(Intent.ACTION_CALL);
            intent.setData(Uri.parse("tel:" + phoneNumber));
            startActivity(intent);
        }
    }

    @Override
    public void onRequestPermissionsResult(int requestCode, String[] permissions, int[]
grantResults) {
        super.onRequestPermissionsResult(requestCode, permissions, grantResults);
        if (requestCode == REQUEST_CALL_PERMISSION) {
            if (grantResults.length > 0 && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
                EditText phoneNumberEditText = findViewById(R.id.phoneNumberEditText);
                String phoneNumber = phoneNumberEditText.getText().toString();
                if (!phoneNumber.isEmpty()) {
                    makePhoneCall(phoneNumber);
                }
            }
        }
```

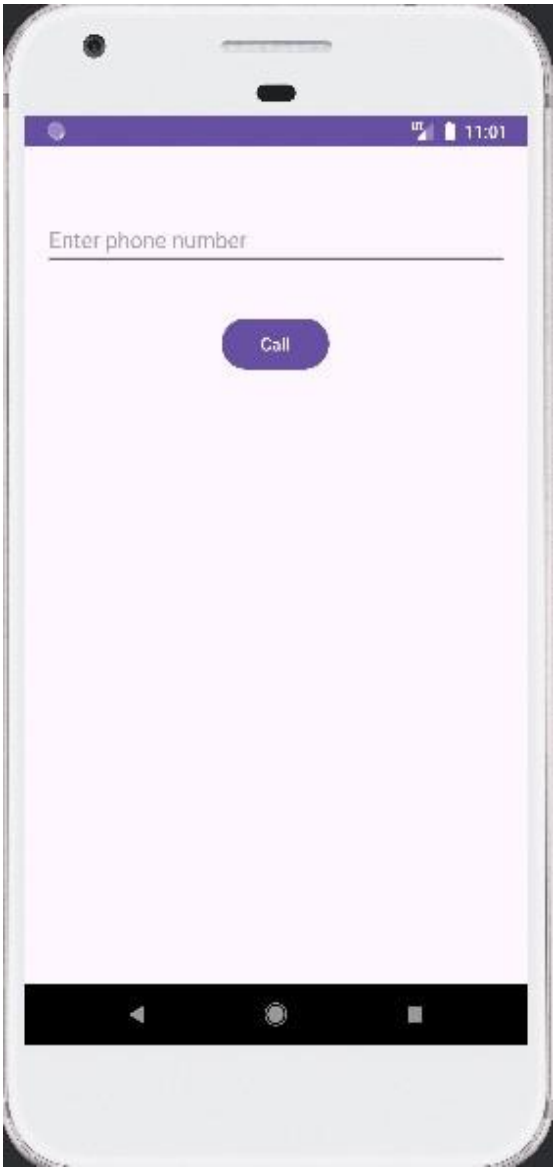
```
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <uses-permission android:name="android.permission.CALL_PHONE" />


    <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.PhoneCall"
        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:-


11:02
(123) 456-7892
00:03
Mute
Keypad
Speaker
Add call
Hold


11:01
Enter phone number
Call

4.Write a Android code to take a picture from camera application.

activity_main.xml

```
<?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">

    <Button
        android:id="@+id/btn"
        android:layout_width="157dp"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="76dp"
        android:layout_marginEnd="75dp"
        android:layout_marginBottom="12dp"
        android:text="capture" />
    <TextureView
        android:id="@+id/textureView"
        android:layout_width="match_parent"
        android:layout_height="473dp"
        android:layout_above="@+id/btn"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_alignParentEnd="true"
        android:layout_marginStart="0dp"
        android:layout_marginTop="0dp"
        android:layout_marginEnd="0dp"
        android:layout_marginBottom="25dp" />
</RelativeLayout>
```

Main_Activity.java

```
package com.example.camera;
import android.Manifest;
import android.content.Context;
import android.content.pm.PackageManager;
import android.graphics.ImageFormat;
import android.graphics.SurfaceTexture;
import android.hardware.camera2.CameraAccessException;
import android.hardware.camera2.CameraCaptureSession;
```

```
import android.hardware.camera2.CameraCharacteristics;
import android.hardware.camera2.CameraDevice;
import android.hardware.camera2.CameraManager;
import android.hardware.camera2.CameraMetadata;
import android.hardware.camera2.CaptureRequest;
import android.hardware.camera2.TotalCaptureResult;
import android.hardware.camera2.params.StreamConfigurationMap;
import android.media.Image; import android.media.ImageReader;
import android.os.Environment;
import android.os.Handler;
import android.os.HandlerThread;
import android.os.Bundle;
import android.util.Size;
import android.util.SparseIntArray;
import android.view.Surface;
import android.view.TextureView;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.OutputStream;
import java.nio.ByteBuffer;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.List;
import java.util.UUID;
public class MainActivity extends AppCompatActivity {
   private Button btn;
   private TextureView textureView;
   //Check state orientation of output image
   private static final SparseIntArray ORIENTATIONS = new
         SparseIntArray(); static{
      ORIENTATIONS.append(Surface.ROTATION_0,90);
      ORIENTATIONS.append(Surface.ROTATION_90,0);
      ORIENTATIONS.append(Surface.ROTATION_180,270);
      ORIENTATIONS.append(Surface.ROTATION_270,180);
   }
   private String cameraId;
         private CameraDevice cameraDevice;
   private CameraCaptureSession cameraCaptureSessions;
```

```
    private CaptureRequest.Builder captureRequestBuilder;
    private Size imageDimension;
    private ImageReader imageReader;
    //Save to FILE private File file;
    private static final int REQUEST_CAMERA_PERMISSION = 200;
    private boolean mFlashSupported;
    private Handler mBackgroundHandler;
    private HandlerThread mBackgroundThread;
    CameraDevice.StateCallback stateCallback = new
            CameraDevice.StateCallback() {
                @Override
                public void onOpened(@NonNull CameraDevice camera) { cameraDevice =
camera;
                    createCameraPreview();
                }
                @Override
                public void onDisconnected(@NonNull CameraDevice cameraDevice) {
                    cameraDevice.close();
                }
                @Override
                public void onError(@NonNull CameraDevice cameraDevice, int i) {
cameraDevice.close();
                    cameraDevice=null;
                }
            };
    @Override
    protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        textureView = (TextureView)findViewById(R.id.textureView);
        assert textureView != null;
        textureView.setSurfaceTextureListener(textureListener); btn =
                (Button)findViewById(R.id.btn);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) { takePicture();
            }
        });
    }
    private void takePicture() { if(cameraDevice == null) return;
        CameraManager manager =
(CameraManager)getSystemService(Context.CAMERA_SERVICE);
        try{
            CameraCharacteristics characteristics =
                    manager.getCameraCharacteristics(cameraDevice.getId()); Size[] jpegSizes =
null;
            if(characteristics != null) jpegSizes =
```

```
characteristics.get(CameraCharacteristics.SCALER_STREAM_CONFIGURATION_MAP)
                    .getOutputSizes(ImageFormat.JPEG);
        //Capture image with custom size int width = 640; int height = 480;
        int width = 0,height=0;
        if(jpegSizes != null && jpegSizes.length > 0)
        {
           width = jpegSizes[0].getWidth();
           height = jpegSizes[0].getHeight();
        }
        final ImageReader reader =
              ImageReader.newInstance(width,height,ImageFormat.JPEG,1); List<Surface>
outputSurface =
              new ArrayList<>(2); outputSurface.add(reader.getSurface());
        outputSurface.add(new Surface(textureView.getSurfaceTexture()));
        final CaptureRequest.Builder captureBuilder =

cameraDevice.createCaptureRequest(CameraDevice.TEMPLATE_STILL_CAPTURE);
        captureBuilder.addTarget(reader.getSurface());
        captureBuilder.set(CaptureRequest.CONTROL_MODE,
              CameraMetadata.CONTROL_MODE_AUTO);
        //Check orientation base on device int rotation =
        getWindowManager().getDefaultDisplay().getRotation();
        int rotation = 0;

captureBuilder.set(CaptureRequest.JPEG_ORIENTATION,ORIENTATIONS.get(rotation));
        File file = new File(Environment.getExternalStorageDirectory() + "/" +
UUID.randomUUID().toString() + ".jpg");
        ImageReader.OnImageAvailableListener readerListener = new
              ImageReader.OnImageAvailableListener() {
                 @Override
                 public void onImageAvailable(ImageReader imageReader) {
                    Image image = null; try{
                       image = reader.acquireLatestImage();
                       ByteBuffer buffer = image.getPlanes()[0].getBuffer();
                       byte[] bytes = new byte[buffer.capacity()]; buffer.get(bytes);
                       save(bytes);
                    }
                    catch (FileNotFoundException e)
                    {
                       e.printStackTrace(); }
                    catch (IOException e)
                    {
                       e.printStackTrace(); } finally {
                       {
                          if(image != null) image.close();
```

```
                    }
                } }
            private void save(byte[] bytes) throws IOException {
                OutputStream outputStream = null; try{
                    outputStream = new FileOutputStream(file); outputStream.write(bytes);
                }finally {
                    if(outputStream != null) outputStream.close();
                }
            }
        };
        reader.setOnImageAvailableListener(readerListener,mBackgroundHandler); final
        CameraCaptureSession.CaptureCallback captureListener = new
                CameraCaptureSession.CaptureCallback() {
            @Override
            public void onCaptureCompleted(@NonNull
                                           CameraCaptureSession session, @NonNull
CaptureRequest request, @NonNull TotalCaptureResult
                                               result) {
                super.onCaptureCompleted(session, request, result);
                Toast.makeText(MainActivity.this, "Saved "+file,
Toast.LENGTH_SHORT).show();
                createCameraPreview();
            }
        };
        cameraDevice.createCaptureSession(outputSurface, new
                CameraCaptureSession.StateCallback() {
            @Override
            public void onConfigured(@NonNull CameraCaptureSession
cameraCaptureSession) {
                try{

cameraCaptureSession.capture(captureBuilder.build(),captureListener,mBackgroundHandler)
;
                } catch (CameraAccessException e) {
                    e.printStackTrace();
                }
            }
            @Override
            public void onConfigureFailed(@NonNull CameraCaptureSession
cameraCaptureSession) {
            }
        },mBackgroundHandler);
    } catch (CameraAccessException e) {
        e.printStackTrace();
    }
  }
```

```
    private void createCameraPreview() {
        try{
            SurfaceTexture texture = textureView.getSurfaceTexture(); assert texture != null;

texture.setDefaultBufferSize(imageDimension.getWidth(),imageDimension.getHeight());
            Surface surface = new Surface(texture); captureRequestBuilder =
                    cameraDevice.createCaptureRequest(CameraDevice.TEMPLATE_PREVIEW);
            captureRequestBuilder.addTarget(surface);
            cameraDevice.createCaptureSession(Arrays.asList(surface), new
                    CameraCaptureSession.StateCallback() {
                        @Override
                        public void onConfigured(@NonNull CameraCaptureSession
cameraCaptureSession) {
                            if(cameraDevice == null) return;
                            cameraCaptureSessions = cameraCaptureSession; updatePreview();
                        }
                        @Override
                        public void onConfigureFailed(@NonNull CameraCaptureSession
cameraCaptureSession) {
                            Toast.makeText(MainActivity.this, "Changed",
                                    Toast.LENGTH_SHORT).show();
                        }
                    },null);
        } catch (CameraAccessException e) {
            e.printStackTrace();
        }
    } private void updatePreview() { if(cameraDevice == null)
        Toast.makeText(this, "Error", Toast.LENGTH_SHORT).show();

captureRequestBuilder.set(CaptureRequest.CONTROL_MODE,CaptureRequest.CONTROL_
MODE_AUTO); try{

cameraCaptureSessions.setRepeatingRequest(captureRequestBuilder.build(),null,mBackgrou
ndHandler);
        } catch (CameraAccessException e) {
            e.printStackTrace();
        }
    }
    private void openCamera() { CameraManager manager =
            (CameraManager)getSystemService(Context.CAMERA_SERVICE); try{
        cameraId = manager.getCameraIdList()[0]; CameraCharacteristics characteristics =
                manager.getCameraCharacteristics(cameraId); StreamConfigurationMap map =

characteristics.get(CameraCharacteristics.SCALER_STREAM_CONFIGURATION_MAP);
assert
                map != null;
```

```
        imageDimension = map.getOutputSizes(SurfaceTexture.class)[0];
        //Check realtime permission if run higher API 23
        if(ActivityCompat.checkSelfPermission(this,
                Manifest.permission.CAMERA) != PackageManager.PERMISSION_GRANTED) {
            ActivityCompat.requestPermissions(this,new String[]{
                    Manifest.permission.CAMERA,
                    Manifest.permission.WRITE_EXTERNAL_STORAGE
            },REQUEST_CAMERA_PERMISSION); return; }
        manager.openCamera(cameraId,stateCallback,null);
    } catch (CameraAccessException e) {
        e.printStackTrace();
    }
    }
    TextureView.SurfaceTextureListener textureListener = new
            TextureView.SurfaceTextureListener() {
                @Override
                public void onSurfaceTextureAvailable(SurfaceTexture surfaceTexture, int i, int i1)
{
                    openCamera();
                }
                @Override
                public void onSurfaceTextureSizeChanged(SurfaceTexture surfaceTexture, int i, int
i1) {
                }
                @Override
                public boolean onSurfaceTextureDestroyed(SurfaceTexture surfaceTexture) {
return false;
                }
                @Override
                public void onSurfaceTextureUpdated(SurfaceTexture surfaceTexture)
                {
                }
            };
    @Override
    public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions,
                                           @NonNull int[] grantResults) {
super.onRequestPermissionsResult(requestCode, permissions,
            grantResults);
        if (requestCode == REQUEST_CAMERA_PERMISSION) {
            if (grantResults[0] != PackageManager.PERMISSION_GRANTED) {
Toast.makeText(this,
                    "You can't use camera without permission", Toast.LENGTH_SHORT).show();
finish();
            }
        }
    }
```

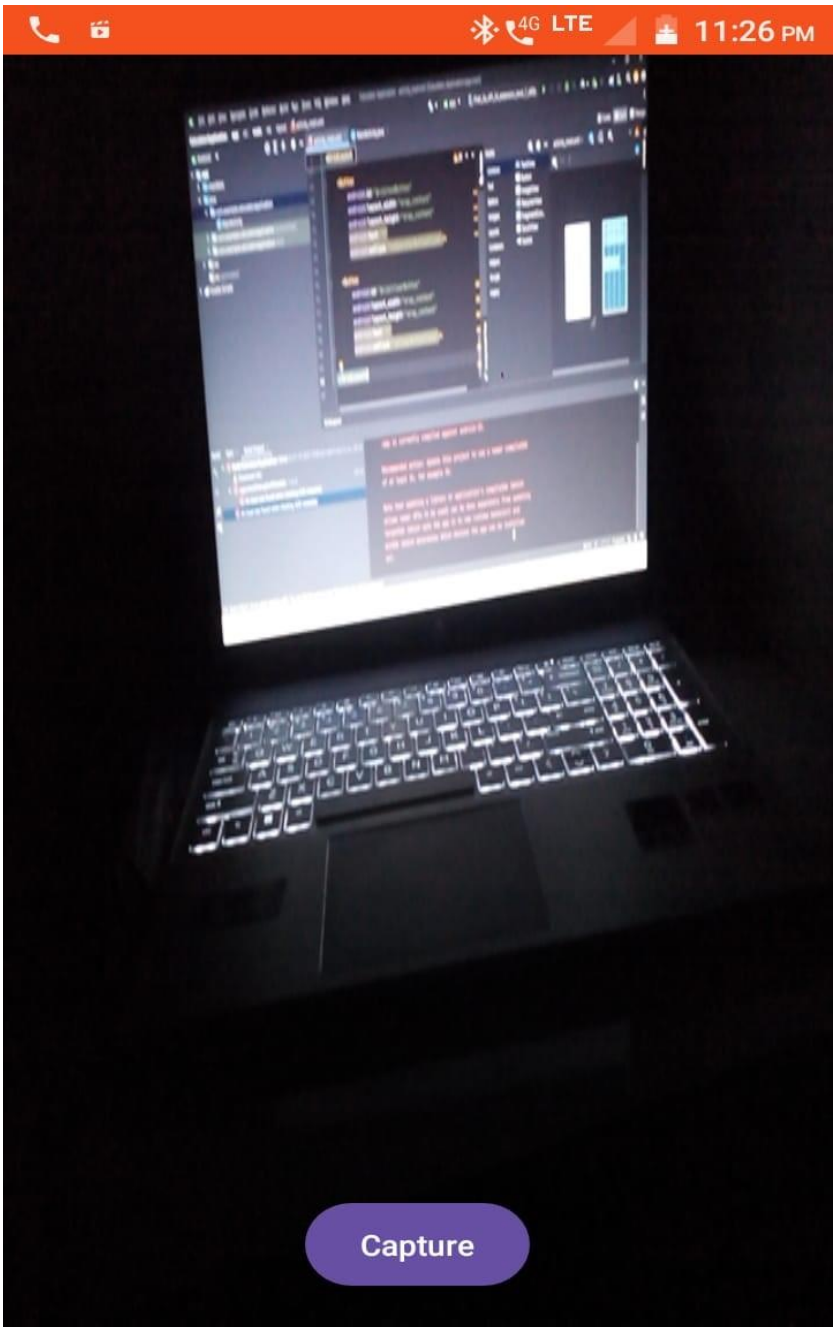
```
    @Override
    protected void onResume() { super.onResume(); startBackgroundThread();
        if(textureView.isAvailable()) openCamera(); else
            textureView.setSurfaceTextureListener(textureListener);
    }
    @Override
    protected void onPause() { stopBackgroundThread(); super.onPause();
    } private void stopBackgroundThread() { mBackgroundThread.quitSafely(); try{
        mBackgroundThread.join(); mBackgroundThread= null; mBackgroundHandler =
                null; } catch (InterruptedException e) {
        e.printStackTrace();
    }
    }
    private void startBackgroundThread() {
        mBackgroundThread = new HandlerThread("Camera Background");
        mBackgroundThread.start();
        mBackgroundHandler = new Handler(mBackgroundThread.getLooper());
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <uses-permission android:name="android.permission.CAMERA"></uses-permission>
    <uses-permission
android:name="android.permission.MANAGE_EXTERNAL_STORAGE"></uses-
permission>
    <uses-permission
android:name="android.permission.READ_EXTERNAL_STORAGE"></uses-permission>
    <uses-permission
android:name="android.permission.WRITE_EXTERNAL_STORAGE"></uses-permission>
    <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.Camera"
        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:-



5.Write an Android code for StopWatch.

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

    <TextView
        android:id="@+id/tvTime"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="48sp"
        android:text="00:00:00"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="50dp" />

    <Button
        android:id="@+id/btnStart"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Start"
        android:layout_below="@id/tvTime"
        android:layout_marginTop="30dp"
        android:layout_centerHorizontal="true" />

    <Button
        android:id="@+id/btnPause"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Pause"
        android:layout_below="@id/btnStart"
        android:layout_marginTop="20dp"
        android:layout_centerHorizontal="true"
        android:enabled="false" />

    <Button
        android:id="@+id/btnResume"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Resume"
        android:layout_below="@id/btnPause"
        android:layout_marginTop="20dp"
        android:layout_centerHorizontal="true"
```

```
    android:enabled="false" />
</RelativeLayout>
```

Main_Activity.java

```
package com.example.stopwatch;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    private TextView tvTime;
    private Button btnStart, btnPause, btnResume;
    private Handler handler;
    private Runnable runnable;
    private int seconds = 0;
    private boolean isRunning = false;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        tvTime = findViewById(R.id.tvTime);
        btnStart = findViewById(R.id.btnStart);
        btnPause = findViewById(R.id.btnPause);
        btnResume = findViewById(R.id.btnResume);

        handler = new Handler();

        btnStart.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                startStopwatch();
            }
        });

        btnPause.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                pauseStopwatch();
```

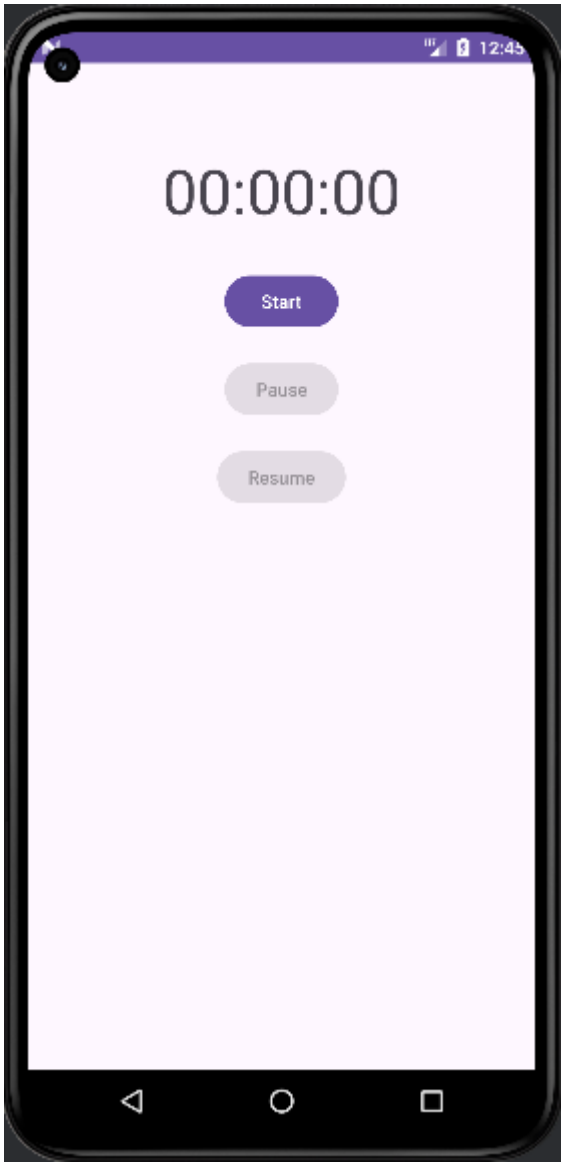
```
        }
    });

    btnResume.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            resumeStopwatch();
        }
    });
}

private void startStopwatch() {
    isRunning = true;
    btnStart.setEnabled(false);
    btnPause.setEnabled(true);
    btnResume.setEnabled(false);

    runnable = new Runnable() {
        @Override
        public void run() {
            seconds++;
            int hours = seconds / 3600;
            int minutes = (seconds % 3600) / 60;
            int secs = seconds % 60;
            tvTime.setText(String.format("%02d:%02d:%02d", hours, minutes, secs));
            handler.postDelayed(this, 1000);
        }
    };
    handler.post(runnable);
}

private void pauseStopwatch() {
    isRunning = false;
    btnStart.setEnabled(false);
    btnPause.setEnabled(false);
    btnResume.setEnabled(true);
    handler.removeCallbacks(runnable);
}

private void resumeStopwatch() {
    isRunning = true;
    btnStart.setEnabled(false);
    btnPause.setEnabled(true);
    btnResume.setEnabled(false);
    handler.post(runnable);
}
```

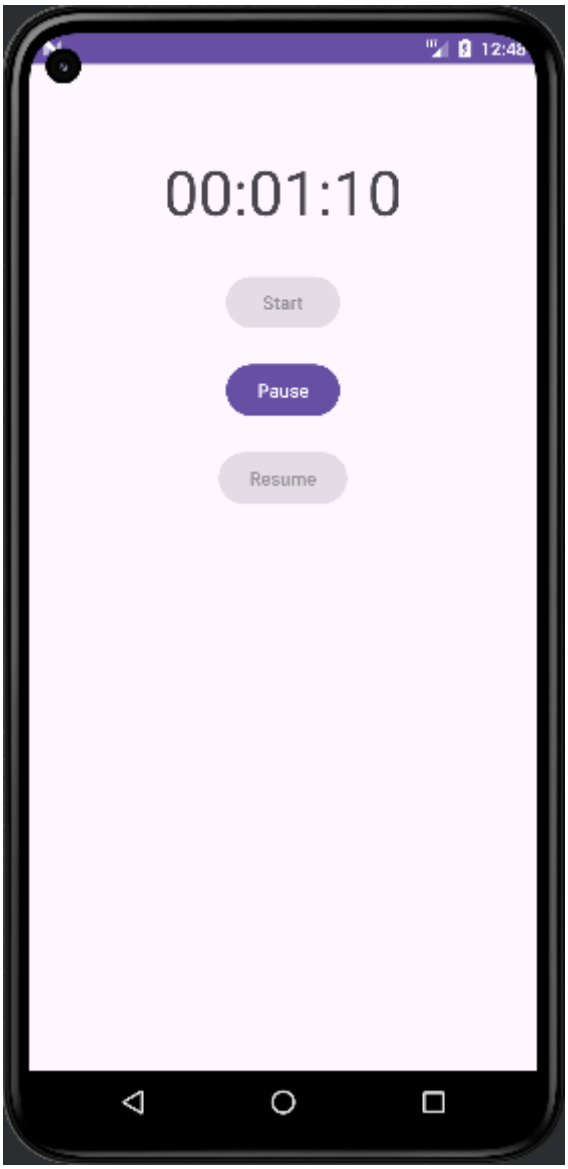
```
    @Override
    protected void onDestroy() {
        super.onDestroy();
        handler.removeCallbacks(runnable);
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">


    <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.StopWatch"
        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:-


12:45
00:00:00
Start
Pause
Resume


12:48
00:01:10
Start
Pause
Resume

6.Create an Calculator application to do addition, subtraction, multiplication, Division.

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<GridLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:orientation="horizontal"
   android:columnCount="3"
   android:rowCount="4"
   android:padding="16dp"
   android:id="@+id/main"
   tools:context=".MainActivity"
   android:background="@drawable/w1">

   <EditText
      android:id="@+id/first"
      android:layout_width="340dp"
      android:layout_height="wrap_content"
      android:layout_columnSpan="3"
      android:layout_marginBottom="16dp"
      android:hint="Enter First Number"
      android:inputType="numberDecimal"
      android:minHeight="80dp"
      android:verticalScrollbarPosition="right"
      android:textColorHint="@color/cardview_dark_background" />

   <EditText
      android:id="@+id/second"
      android:layout_width="340dp"
      android:layout_height="wrap_content"
      android:layout_columnSpan="3"
      android:layout_marginBottom="16dp"
      android:hint="Enter Second Number"
      android:textColorHint="@color/cardview_dark_background"
      android:inputType="numberDecimal"
      android:minHeight="80dp"/>

   <TextView
      android:id="@+id/tv"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_columnSpan="3"
```

```
    android:text=""
    android:textSize="35sp"
    android:gravity="end"
    android:layout_gravity="fill_horizontal"
    android:layout_marginBottom="100dp"/>

<Button
    android:id="@+id/add"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="+"
    android:onClick="onOperatorButtonClick"/>

<Button
    android:id="@+id/sub"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="-"
    android:onClick="onOperatorButtonClick"/>

<Button
    android:id="@+id/mul"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="*"
    android:onClick="onOperatorButtonClick"/>

<Button
    android:id="@+id/div"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="/"
    android:onClick="onOperatorButtonClick"/>

<Button
    android:id="@+id/mod"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="%"
    android:onClick="onOperatorButtonClick"/>

<Button
    android:id="@+id/clear"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="C"
```

```
        android:onClick="onClearButtonClick"/>


</GridLayout>
```

Main_Activity.java

```
package com.example.calculator;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

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 {

    private EditText first,second;
    private TextView res;
    private Button add,sub,mul,div,mod;

    @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;
        });
        first=findViewById(R.id.first);
        second=findViewById(R.id.second);
        res=findViewById(R.id.tv);
        add=findViewById(R.id.add);
        sub=findViewById(R.id.sub);
        mul=findViewById(R.id.mul);
        div=findViewById(R.id.div);
        mod=findViewById(R.id.mod);
```

```
}

public void onOperatorButtonClick(View view)
{
   Button btn=(Button)view;
   String operator=btn.getText().toString();
   double result=0;

   String firststr=first.getText().toString();
   String secondstr=second.getText().toString();

   if(!firststr.isEmpty()&&!secondstr.isEmpty())
   {
      double firstno=Double.parseDouble(firststr);
      double secondno=Double.parseDouble(secondstr);
      switch (operator)
      {
         case "+":
            result=firstno+secondno;
            break;
         case "-":
            result=firstno-secondno;
            break;
         case "*":
            result=firstno*secondno;
            break;
         case "/":
            if(secondno!=0)
            {
               result=firstno/secondno;
            }
            else {
               res.setText("Cannot Divide by zero");
               return;
            }
            break;
         case "%":
            if(secondno!=0)
            {
               result=firstno%secondno;
            }
            else {
               res.setText("Cannot perform modulus with zero");
               return;
            }
            break;
```

```
            }
            res.setText("Result:"+result);
        }
        else {
            res.setText("Please Enter both numbers.");
        }
    }

    public void onClearButtonClick(View view)
    {
        first.setText("");
        second.setText("");
        res.setText("");
    }
}
//API 24
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <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.Calculator"
        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:-

7.Design android application for login activity. Write android code to check login credentials with username = "MCA" and password = "Android". Display appropriate toast message to the 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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/user"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="UserName"
        android:inputType="text"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.502"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.357" />


    <EditText
        android:id="@+id/pass"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Password"
        android:inputType="textPassword"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.502"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/login"
        android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
    android:text="Login"
    android:textSize="40dp"
    android:textStyle="bold"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.123" />

<TextView
    android:id="@+id/mca"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="MCA"
    android:textColor="#7ae627"
    android:textSize="34dp"
    android:textStyle="bold"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.223" />

<Button
    android:id="@+id/btn1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Login"
    android:textSize="26dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.195"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.762" />

<Button
    android:id="@+id/btn2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Cancel"
    android:textSize="26dp"
    app:layout_constraintBottom_toBottomOf="parent"
```

```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.77"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.762" />

    <TextView
        android:id="@+id/tv1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Attempt Left:"
        android:textSize="20dp"
        app:layout_constraintBottom_toTopOf="@+id/btn1"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.384"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/pass"
        app:layout_constraintVertical_bias="0.495" />

    <TextView
        android:id="@+id/tv"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=""
        android:textSize="20dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.651"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.626" />


</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity.java

```
package com.example.login;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
```

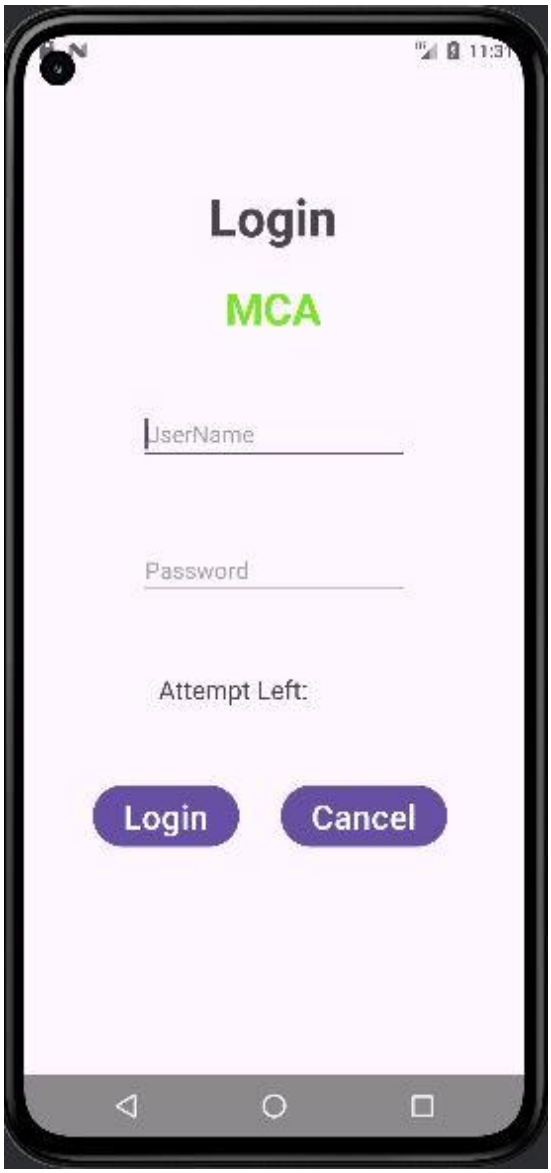
```
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {
   TextView tv;
   EditText user,pass;
   Button btn1,btn2;
   int counter=3;

   @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;
      });

      btn1 = (Button)findViewById(R.id.btn1);
      btn2 = (Button)findViewById(R.id.btn2);
      user = (EditText)findViewById(R.id.user);
      pass =(EditText)findViewById(R.id.pass);
      tv = (TextView)findViewById(R.id.tv);
      tv.setVisibility(View.GONE);

      btn1.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) { if(user.getText().toString().equals("MCA") &&
pass.getText().toString().equals("Android")) {

Toast.makeText(getApplicationContext(),"Redirecting...",Toast.LENGTH_SHORT).show();
         }else{
            Toast.makeText(getApplicationContext(), "Wrong
Credentials",Toast.LENGTH_SHORT).show();
            tv.setVisibility(View.VISIBLE);
            //tv.setBackgroundColor(Color.RED);
            counter--;
            tv.setText(Integer.toString(counter));
            if (counter == 0) {
```

```
                btn1.setEnabled(false);
            }
        }
        }
    });
    btn2.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            finish();
        }
    });
  }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools">

  <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.Login"
    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:-


Login
MCA
UserName
Password
Attempt Left:
Login
Cancel


Login
MCA
MCA
Login
Cancel
Login Successfully

8.Create a fragment that has its own UI and enable your activities to communicate with fragments.

activity_main.xml

```
<?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="horizontal"
   tools:context=".MainActivity">
   <fragment
      android:layout_height="match_parent"
      android:layout_width="350px"
      class="com.tutlane.fragment.ListMenuFragment"
      android:id="@+id/fragment"
      tools:ignore="MissingClass" />
   <fragment
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      class="com.tutlane.fragment.DetailsFragment"
      android:id="@+id/fragment2"/>


</LinearLayout>
```

Details_info.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:background="#0079D6">

   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:textColor="#ffffff"
      android:layout_marginTop="200px"
      android:layout_marginLeft="200px"
      android:id="@+id/Name"/>

   <TextView
      android:id="@+id/Location"
```

```
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_marginLeft="200px"
        android:layout_marginTop="50px"
        android:textColor="#ffffff" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"></TextView>

</LinearLayout>
```

List_items.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">

    <ListView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@android:id/list"/>

</LinearLayout>
```

Main_Activity.java

```
package com.example.fragment;

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);

    }
}
```

DetailsFragment.java

```
package com.tutlane.fragment;

import android.app.Fragment;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

import com.example.fragment.R;

public class DetailsFragment extends Fragment {
    TextView name,location;
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle
            savedInstanceState) {
        View view = inflater.inflate(R.layout.details_info, container, false); name
                = (TextView)view.findViewById(R.id.Name); location =
                (TextView)view.findViewById(R.id.Location); return view;
    }
    public void change(String uname, String ulocation){
        name.setText(uname); location.setText(ulocation);
    }
}
```

ListMenuFragment.java

```
package com.tutlane.fragment;
import android.app.ListFragment;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.ArrayAdapter;
import android.widget.ListView;

import com.example.fragment.R;
```

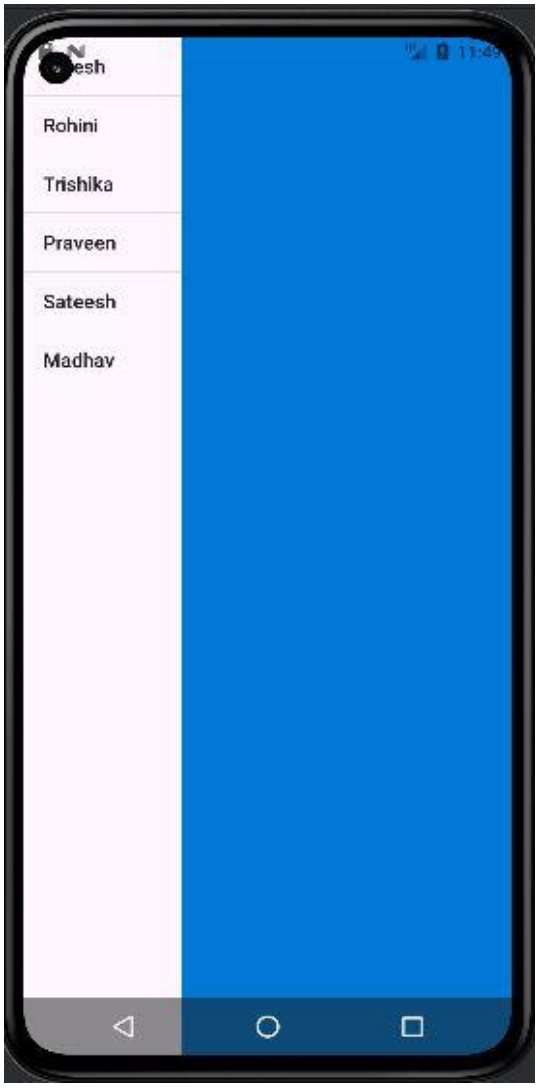
```
public class ListMenuFragment extends ListFragment {
   String[] users = new String[] {
         "Suresh","Rohini","Trishika","Praveen","Sateesh","Madhav" };
   String[] location = new
         String[]{"Hyderabad","Guntur","Hyderabad","Bangalore","Vizag","Nagpur"};
   @Override
   public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle
         savedInstanceState) {
      View view =inflater.inflate(R.layout.list_items, container, false);
      ArrayAdapter<String> adapter = new ArrayAdapter<String>(getActivity(),
            android.R.layout.simple_list_item_1, users); setListAdapter(adapter);
      return view;
   }
   @Override
   public void onListItemClick(ListView l, View v, int position, long id) {
      DetailsFragment txt =
(DetailsFragment)getFragmentManager().findFragmentById(R.id.fragment2);
      txt.change("Name: "+ users[position],"Location : "+ location[position]);
      getListView().setSelector(android.R.color.holo_blue_dark);
   }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools">

   <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.Fragment"
      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:-



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

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<ListView 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/listview"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">


</ListView>
```

custom_list_view.xml

```
<?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="horizontal"
    tools:ignore="UselessParent">

    <ImageView
        android:layout_width="84dp"
        android:layout_height="84dp"
        android:id="@+id/image"
        android:padding="16dp"
        tools:ignore="ContentDescription"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center_vertical"
        android:orientation="vertical">

        <TextView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/tv"
            android:layout_marginTop="16dp"
            android:gravity="bottom|left"
            android:textColor="@android:color/black"
            android:textSize="18sp"
```

```
        android:textStyle="bold"/>
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/tv1"
        android:layout_marginBottom="16dp"
        android:gravity="top|left"
        android:textColor="@android:color/black"
        android:textSize="14sp"/>


  </LinearLayout>


</LinearLayout>
```

MainActivity.java

```
package com.example.listview;

import android.os.Bundle;
import android.widget.ListView;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    EdgeToEdge.enable(this);
    setContentView(R.layout.activity_main);

    final ArrayList<NumbersView> arrayList = new ArrayList<NumbersView>();
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "1", "Mango"));
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "2", "Banana"));
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "3", "Papaya"));
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "4", "Greps"));
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "5", "Orange"));
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "6", "Pineapple"));
    arrayList.add(new NumbersView(R.drawable.geeks_logo, "7", "Apple"));
```

```
        arrayList.add(new NumbersView(R.drawable.geeks_logo, "8", "Cherry"));
        arrayList.add(new NumbersView(R.drawable.geeks_logo, "9", "WaterMelon"));
        arrayList.add(new NumbersView(R.drawable.geeks_logo, "10", "Strawberries"));
        NumberViewAdapter numberArrayAdapter = new NumberViewAdapter(this, arrayList);
        ListView numbersListView = findViewById(R.id.listview);
        numbersListView.setAdapter(numberArrayAdapter);
    }
}
```

NumbersView.java

```
package com.example.listview;

public class NumbersView
{
    private int ivNumbersImageId;
    private String mNumberInDigit,mNumbersInText;
    public NumbersView(int NumbersImageId, String NumbersInDigit, String
NumbersInText)
    {
        ivNumbersImageId = NumbersImageId;
        mNumberInDigit = NumbersInDigit;
        mNumbersInText = NumbersInText;
    }
    public int getNumbersImageId() {
        return ivNumbersImageId;
    }
    public String getNumberInDigit() {
        return mNumberInDigit;
    }
    public String getNumbersInText() {
        return mNumbersInText;
    }
}
```

NumberViewAdapter.java

```
package com.example.listview;

import android.content.Context;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.ArrayAdapter;
import android.widget.ImageView;
```

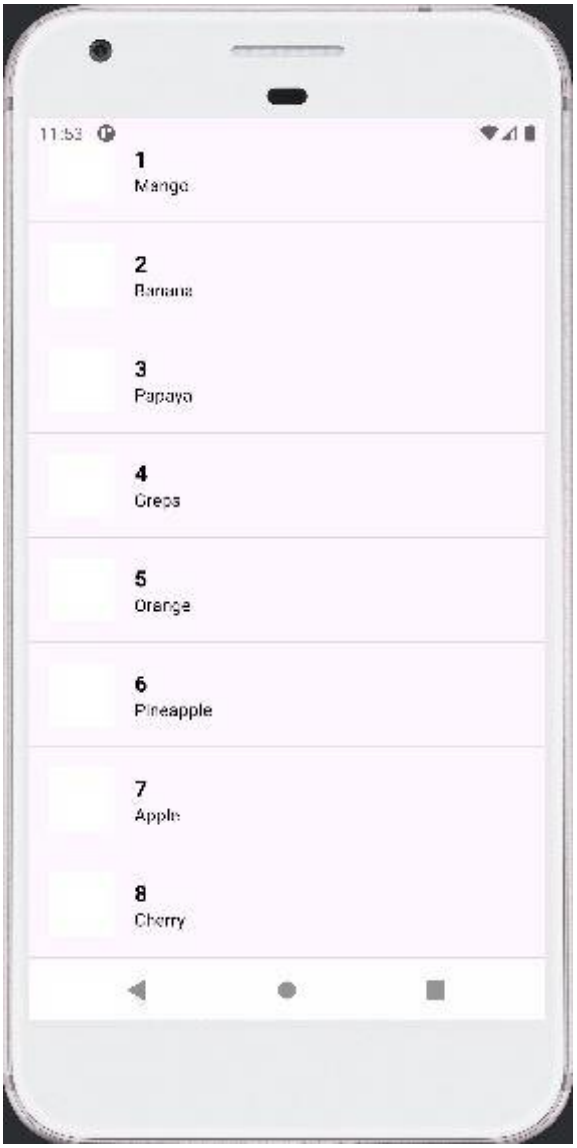
```
import android.widget.TextView;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;

import java.util.ArrayList;
public class NumberViewAdapter extends ArrayAdapter<NumbersView>
{
   public NumberViewAdapter (@NonNull Context context, ArrayList<NumbersView>
         arrayList) {
      super(context, 0, arrayList);
   }
   @NonNull
   @Override
   public View getView(int position, @Nullable View convertView, @NonNull ViewGroup
         parent) {
      View currentItemView = convertView;
      if (currentItemView == null) {
         currentItemView =
LayoutInflater.from(getContext()).inflate(R.layout.custom_list_view, parent, false);
      }
      NumbersView currentNumberPosition = getItem(position);
      ImageView numbersImage = currentItemView.findViewById(R.id.image);
      assert currentNumberPosition != null;
      numbersImage.setImageResource(currentNumberPosition.getNumbersImageId());
      TextView textView1 = currentItemView.findViewById(R.id.tv);
      textView1.setText(currentNumberPosition.getNumberInDigit());
      TextView textView2 = currentItemView.findViewById(R.id.tv1);
      textView2.setText(currentNumberPosition.getNumbersInText());
      return currentItemView;
   }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools">

   <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.ListView"
        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:-



10. Write an application to demonstrate Alert Dialog Box in android.

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:id="@+id/main"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">

   <Button
      android:id="@+id/btn"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Close App"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintLeft_toLeftOf="parent"
      app:layout_constraintRight_toRightOf="parent"
      app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.dialogue_box;

import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AlertDialog;
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 {

   Button close;
   AlertDialog.Builder builder;
```

```
    @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;
        });
        close=(Button)findViewById(R.id.btn);
        builder=new AlertDialog.Builder(this);
        close.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                builder.setMessage(R.string.dialog_message).setTitle(R.string.dialog_title);
                builder.setMessage("Do you want to close this
application?").setCancelable(false).setPositiveButton("Yes", new
DialogInterface.OnClickListener() {
                    @Override
                    public void onClick(DialogInterface dialogInterface, int i) {
                        finish();
                        Toast.makeText(getApplicationContext(),"you choose yes action for
alertbox",Toast.LENGTH_SHORT).show();
                    }
                }).setNegativeButton("No", new DialogInterface.OnClickListener() {
                    @Override
                    public void onClick(DialogInterface dialogInterface, int i) {
                        dialogInterface.cancel();
                        Toast.makeText(getApplicationContext(),"you choose no action for
alertbox",Toast.LENGTH_SHORT).show();
                    }
                });
                AlertDialog alert= builder.create();
                alert.setTitle("AlertDialog");
                alert.show();
            }
        });
    }
}
```

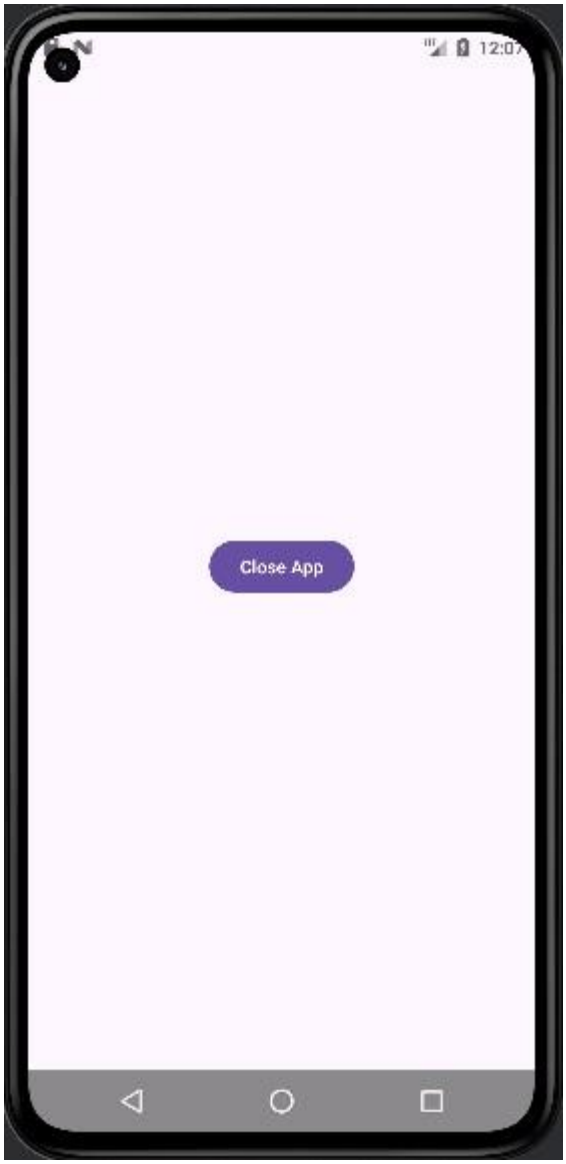
strings.xml

```
<resources>
   <string name="app_name">AlertDialog</string>
   <string name="dialog_message">Welcome to Alert Dialogue</string>
   <string name="dialog_title">JavaPoint</string>
</resources>
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools">

   <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.Dialogue_box"
      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:-


Close App


AlertDialog
Do you want to close this application?
No
Yes

11. Demonstrate Options Menu in android.

main_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto">
   <item
      android:id="@+id/action_settings"
      android:title="Settings"
      app:showAsAction="never" />
   <item
      android:id="@+id/action_about"
      android:title="About"
      app:showAsAction="never" />
</menu>
```

activity_main.xml

```
<?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"
   android:layout_width="match_parent"
   android:layout_height="match_parent">

   <androidx.appcompat.widget.Toolbar
      android:id="@+id/toolbar"
      android:layout_width="match_parent"
      android:layout_height="?attr/actionBarSize"
      android:background="?attr/colorPrimary"
      app:title="My App"
      app:popupTheme="@style/ThemeOverlay.AppCompat.Light" />


</RelativeLayout>
```

MainActivity.java

```
package com.example.menu;

import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
```

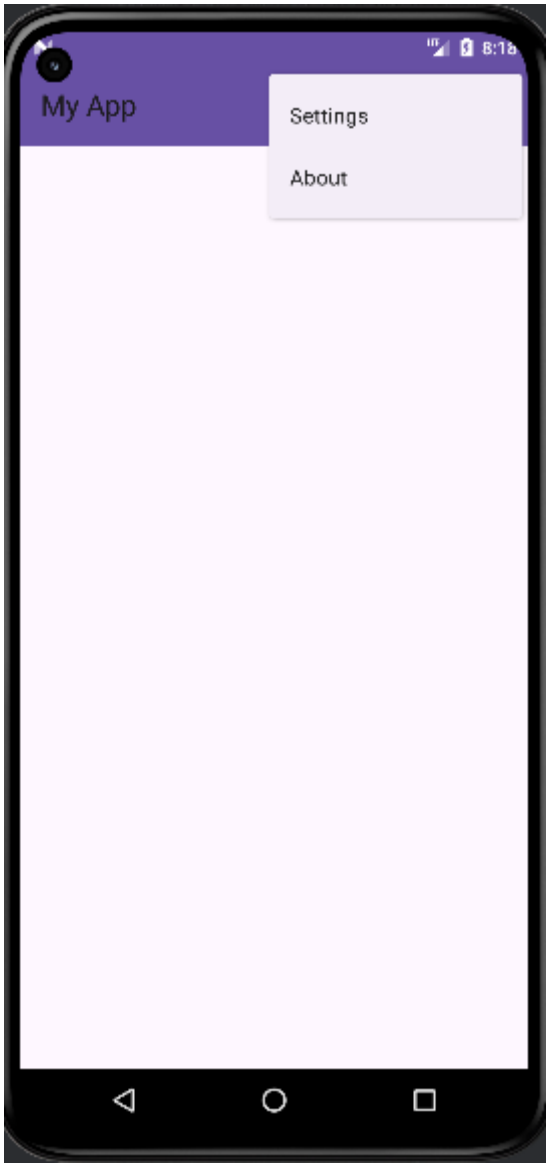
```
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.main_menu, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        int id = item.getItemId();
        if (id == R.id.action_settings) {
            Toast.makeText(this, "Settings selected", Toast.LENGTH_SHORT).show();
            return true;
        } else if (id == R.id.action_about) {
            Toast.makeText(this, "About selected", Toast.LENGTH_SHORT).show();
            return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <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.Menu"
```

```
        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. Write an application to produce Notification.

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:id="@+id/main"
    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="Android Notification"
        android:textSize="34dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.091"
        android:textAppearance="@style/Base.Theme.Notification"/>

    <Button
        android:id="@+id/btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="112dp"
        android:text="Notify"
        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="0.714" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

activity_notification.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=".NotificationView">

    <TextView
        android:id="@+id/tv"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginStart="8dp"
        android:layout_marginTop="8dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.096"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/tv2"
        app:layout_constraintVertical_bias="0.206"
        android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"/>

    <TextView
        android:id="@+id/tv2"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:text="your detail of notification..."
        android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
        tools:ignore="MissingConstraints" />


</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity.java

```
package com.example.notification;

import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
```

```
import android.widget.Toast;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.NotificationCompat;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {

    Button btn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        btn=findViewById(R.id.btn);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {

                addNotification();
            }
        });
    }
    private void addNotification()
    {
        NotificationCompat.Builder builder=new
NotificationCompat.Builder(this).setSmallIcon(R.drawable.messageicon).setContentTitle("N
otifications Example").setContentText("This is a notification
message").setAutoCancel(true).setPriority(NotificationCompat.PRIORITY_DEFAULT);
        Intent notificationIntent=new Intent(this,NotificationView.class);
        notificationIntent.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);

Toast.makeText(getApplicationContext(),"Redirecting...",Toast.LENGTH_SHORT).show();
        notificationIntent.putExtra("message","This is notification message");
        PendingIntent pendingintent= PendingIntent.getActivity(this, 0, notificationIntent,
PendingIntent.FLAG_UPDATE_CURRENT);
        builder.setContentIntent(pendingintent);
        NotificationManager
manager=(NotificationManager)getSystemService(Context.NOTIFICATION_SERVICE);
        manager.notify(0,builder.build());
    }
}
```

NotificationView.java

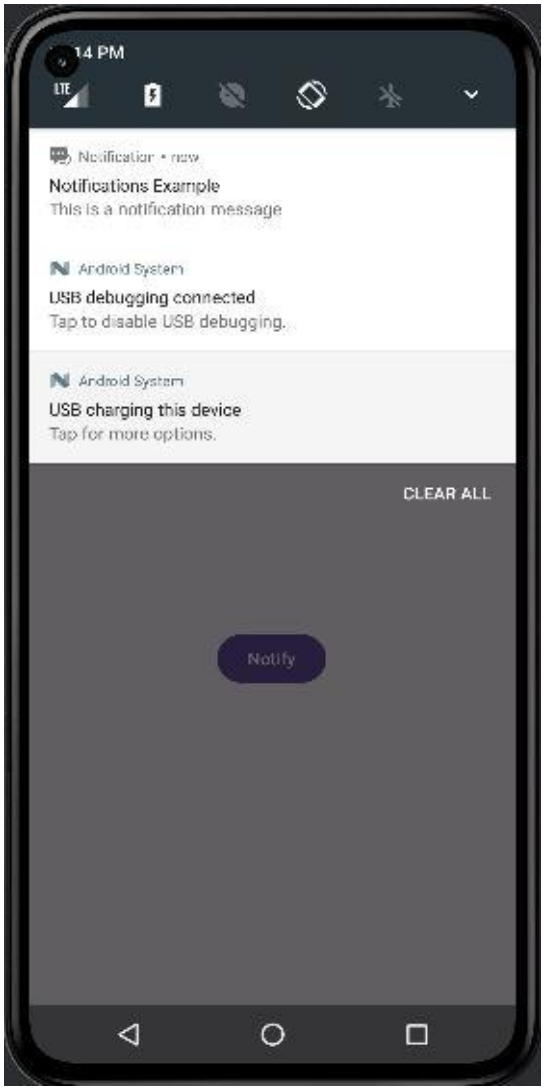
```
package com.example.notification;

import android.app.Activity;
import android.os.Bundle;
import android.widget.TextView;
import android.os.Bundle;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class NotificationView extends AppCompatActivity {

    TextView textView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_notification);
        textView=(TextView) findViewById(R.id.tv);
        String message=getIntent().getStringExtra("message");
        textView.setText(message);

    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <uses-permission android:name="android.permission.POST_NOTIFICATIONS" />
    <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.Notification"
        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:-



13. Write an android application using SQLite to create table and perform CRUD operations

activity_main.xml

```
<?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"
   tools:context=".MainActivity">
   <EditText
      android:id="@+id/idEdtCourseName"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="10dp"
      android:hint="Enter course Name" />
   <EditText
      android:id="@+id/idEdtCourseDuration"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="10dp"
      android:hint="Enter Course Duration" />
   <EditText
      android:id="@+id/idEdtCourseTracks"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="10dp"
      android:hint="Enter Course Tracks" />
   <EditText
      android:id="@+id/idEdtCourseDescription"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="10dp"
      android:hint="Enter Course Description" />
   <Button
      android:id="@+id/idBtnAddCourse"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="10dp"
      android:text="Add Course"
      android:textAllCaps="false" />
</LinearLayout>
```

Main_Activity.java

```
package com.example.crud;

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 courseNameEdt, courseTracksEdt,  courseDurationEdt,
courseDescriptionEdt;   private Button addCourseBtn;  private DBHandler
        dbHandler;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);     courseNameEdt =
findViewById(R.id.idEdtCourseName);     courseTracksEdt =
findViewById(R.id.idEdtCourseTracks);     courseDurationEdt =
            findViewById(R.id.idEdtCourseDuration);
      courseDescriptionEdt =
            findViewById(R.id.idEdtCourseDescription);
      addCourseBtn = findViewById(R.id.idBtnAddCourse);
      dbHandler = new DBHandler(MainActivity.this);
      addCourseBtn.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            String courseName =
                  courseNameEdt.getText().toString();
            String courseTracks =
                  courseTracksEdt.getText().toString();
            String courseDuration =
                  courseDurationEdt.getText().toString();
            String courseDescription =
                  courseDescriptionEdt.getText().toString();
            if (courseName.isEmpty() &&
                  courseTracks.isEmpty() && courseDuration.isEmpty() &&
                  courseDescription.isEmpty()) {
               Toast.makeText(MainActivity.this, "Please  enter all the data..",
Toast.LENGTH_SHORT).show();
               return;
            }
            dbHandler.addNewCourse(courseName, courseDuration, courseDescription,
courseTracks);
```

```
            Toast.makeText(MainActivity.this, "Course has been added.",
                  Toast.LENGTH_SHORT).show();
            courseNameEdt.setText("");
            courseDurationEdt.setText("");
            courseTracksEdt.setText("");              courseDescriptionEdt.setText("");
         }
      });
   }
}
```

DBHandler.java

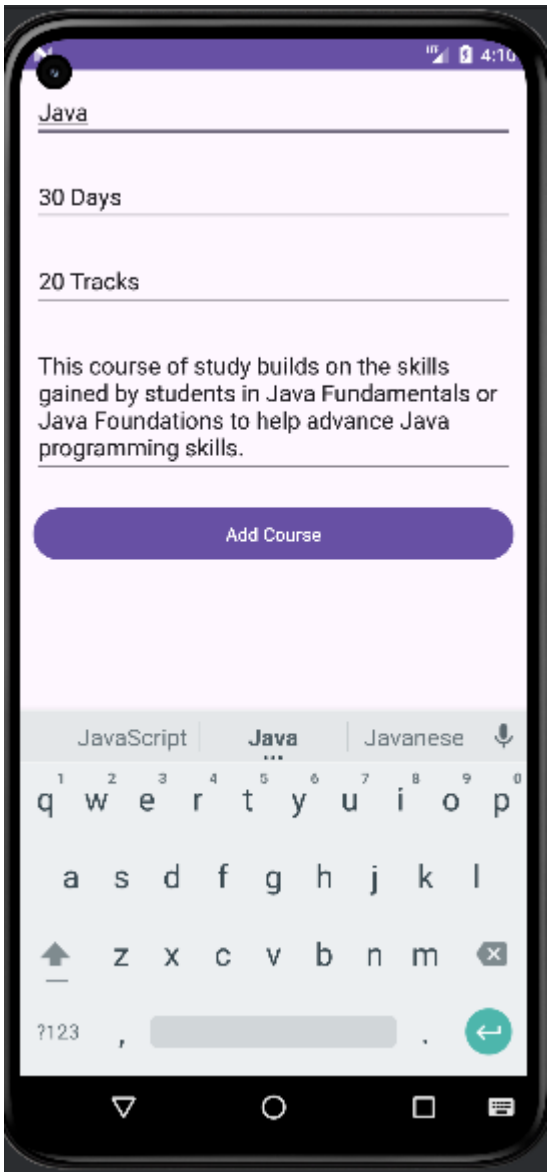
```
package com.example.crud;

import android.content.ContentValues;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
public class DBHandler extends SQLiteOpenHelper
{
   private static final String DB_NAME = "coursedb";
   private static final int DB_VERSION = 1;
   private static final String TABLE_NAME = "mycourses";
   private static final String ID_COL = "id";
   private static final String NAME_COL = "name";
   private static final String DURATION_COL = "duration";
   private static final String DESCRIPTION_COL = "description";
   private static final String TRACKS_COL = "tracks";
   public DBHandler(Context context) {
      super(context, DB_NAME, null, DB_VERSION);
   }
   @Override
   public void onCreate(SQLiteDatabase db) {
      String query = "CREATE TABLE " + TABLE_NAME + " (" + ID_COL + " INTEGER
PRIMARY KEY AUTOINCREMENT, " + NAME_COL + " TEXT," + DURATION_COL + "
TEXT," + DESCRIPTION_COL + " TEXT," + TRACKS_COL + " TEXT)";
      db.execSQL(query);
   }
   public void addNewCourse(String courseName, String courseDuration, String
courseDescription, String courseTracks)
   {
      SQLiteDatabase db = this.getWritableDatabase();
      ContentValues values = new ContentValues();
      values.put(NAME_COL, courseName);
      values.put(DURATION_COL, courseDuration);
      values.put(DESCRIPTION_COL, courseDescription);
```

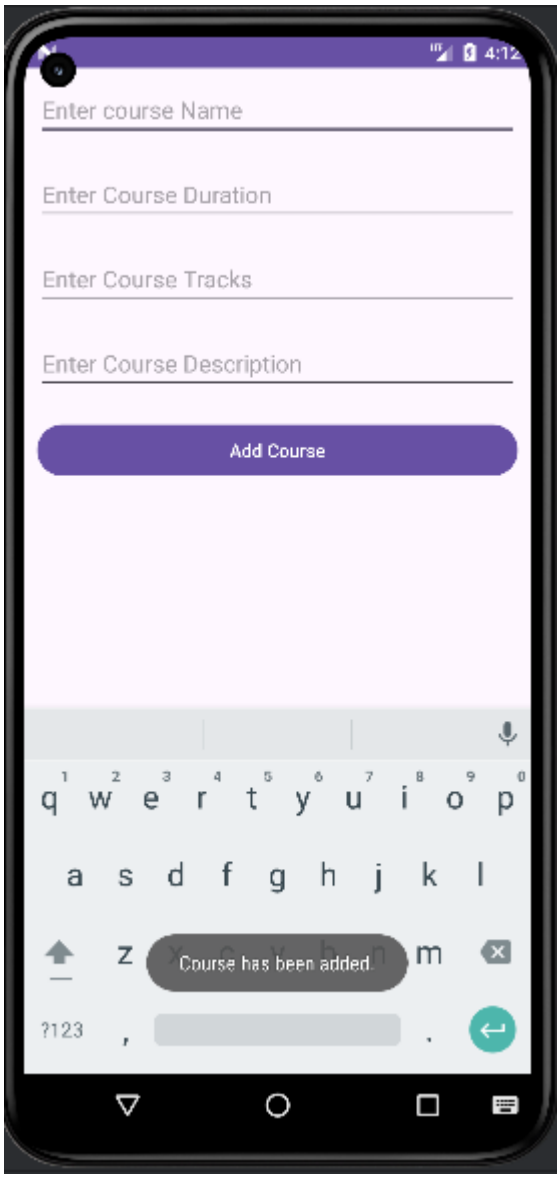
```
        values.put(TRACKS_COL, courseTracks);
        db.insert(TABLE_NAME, null, values);
        db.close();
    }
    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME);
        onCreate(db);
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <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.CRUD"
        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:-


Java
30 Days
20 Tracks
This course of study builds on the skills gained by students in Java Fundamentals or Java Foundations to help advance Java programming skills.
Add Course
JavaScript
Java
Javanese


Enter course Name
Enter Course Duration
Enter Course Tracks
Enter Course Description
Add Course
Course has been added.

14. Demonstrate WebView to display the web pages in an android application.

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">

    <WebView
        android:id="@+id/webView"
        android:layout_width="0dp"
        android:layout_height="0dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.webview;

import android.os.Bundle;
import android.webkit.WebSettings;
import android.webkit.WebView;
import android.webkit.WebViewClient;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private WebView webView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        // Initialize WebView
        webView = findViewById(R.id.webView);
```

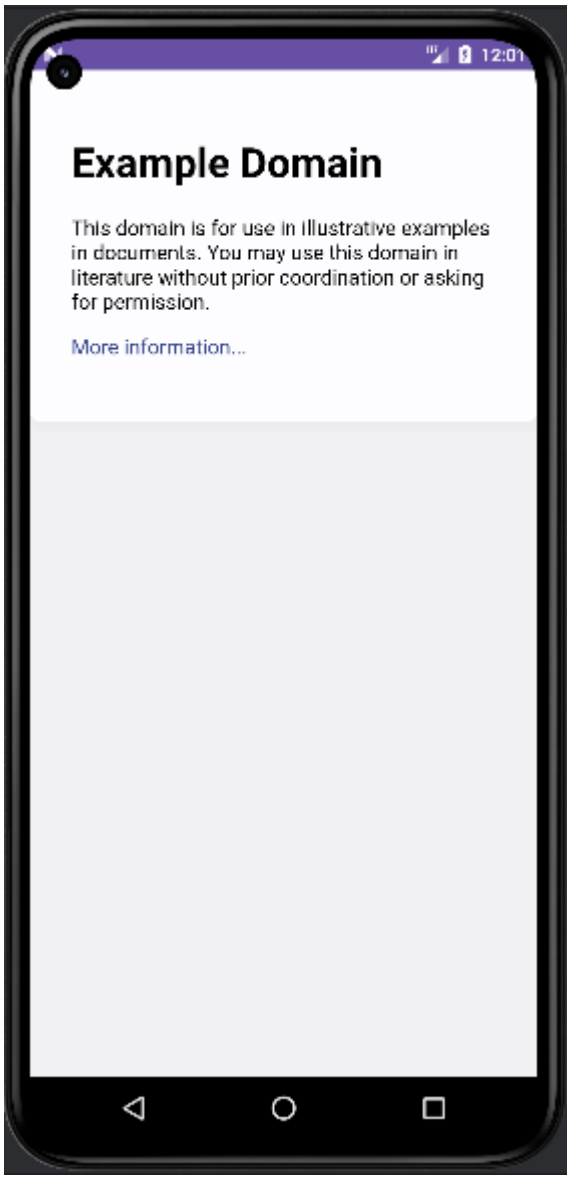
```
        // Set WebViewClient to prevent opening in a browser
        webView.setWebViewClient(new WebViewClient());

        // Enable JavaScript
        WebSettings webSettings = webView.getSettings();
        webSettings.setJavaScriptEnabled(true);

        // Load a URL
        webView.loadUrl("https://www.example.com");
    }

    // Handle back button to navigate within WebView
    @Override
    public void onBackPressed() {
        if (webView.canGoBack()) {
            webView.goBack();
        } else {
            super.onBackPressed();
        }
    }
}
```

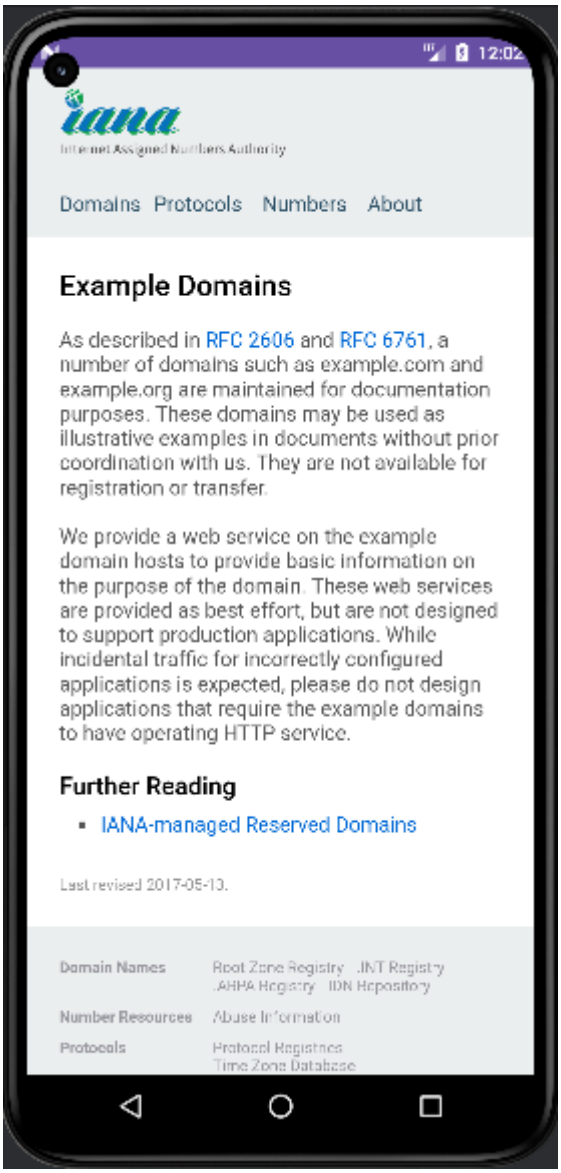
AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <uses-permission android:name="android.permission.INTERNET"/>

    <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.WebView"
        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:-





15. Write an android app to write JSON data into a file and read JSON data from created file.

activity_main.xml

```
<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=".MainActivity" >
   <TextView
      android:id="@+id/textView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentLeft="true"
      android:layout_alignParentTop="true"
      android:layout_marginLeft="75dp"
      android:layout_marginTop="46dp"
      android:text="TextView" />
</RelativeLayout>
```

Main_Activity.java

```
package com.example.json;
import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;
import android.app.Activity;
import android.os.Bundle;
import android.widget.TextView;
public class MainActivity extends Activity {
   @Override
   protected void onCreate(Bundle savedInstanceState)
   {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      TextView output = (TextView) findViewById(R.id.textView1);
      String strJson="{ \"Employee\" :[{\"id\":\"101\",\"name\":\"Sonoo
Jaiswal\",\"salary\":\"50000\"},{\"id\":\"102\",\"name\":\"Vimal
Jaiswal\",\"salary\":\"60000\"}] }";
      String data = "";
      try
      {
         JSONObject  jsonRootObject = new JSONObject(strJson);
         JSONArray jsonArray = jsonRootObject.optJSONArray("Employee");
         for(int i=0; i < jsonArray.length(); i++)
```

```
        {
            JSONObject jsonObject = jsonArray.getJSONObject(i);
            int id = Integer.parseInt(jsonObject.optString("id").toString());
            String name = jsonObject.optString("name").toString();
            float salary =  Float.parseFloat(jsonObject.optString("salary").toString());
            data += "Node "+i+" : \n id= "+ id +" \n Name= "+ name +" \n Salary= "+ salary +"
\n ";
        }
        output.setText(data);
      } catch (JSONException e) {e.printStackTrace();}
   }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools">

   <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.JSON"
      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:-


4:26
Node 0 :
id= 101
Name= Sonoo Jaiswal
Salary= 50000.0
Node 1 :
id= 102
Name= Vimal Jaiswal
Salary= 60000.0

16. Write an application to display a PDF as an image in React app using URL

app.js

```
import logo from './logo.svg';
import './App.css';
import Pdf from './Pdf';


function App() {
  return (
    <div className="App">
      <Pdf/>
    </div>
  );
}


export default App;
```

pdf.js

```
import React from 'react';
import PDFViewer from 'pdf-viewer-reactjs';


const Pdf = () => {
   const url = ${process.env.PUBLIC_URL}/sample.pdf; // Assuming the file is named pdf-sample.pdf



  return (
    <div>
      <PDFViewer
        document={{
          url: url,
```

```
        }}
        scale={1.5}
      />
    </div>
  );
};

export default Pdf;
```

Output:-

17. Develop simple flutter application to open a browser using Android SDK

Dart File

```
import 'package:flutter/material.dart';
void main() {
runApp(const MyApp());
}
class MyApp extends StatelessWidget {
const MyApp({Key? key}) : super(key: key);
@override
Widget build(BuildContext context) {
        return MaterialApp(
        title: 'Hello World Demo Application',
        theme: ThemeData(
                primarySwatch: Colors.lightGreen,
        ),
        home: const MyHomePage(title: 'Home page'),
        );
}
}
class MyHomePage extends StatelessWidget {
const MyHomePage({Key? key, required this.title}) : super(key: key);
final String title;
@override
Widget build(BuildContext context) {
        return Scaffold(
        appBar: AppBar(
                title: Text(title),
        ),
        body: const Center(
                child: Text(
```

```
                'Welcome to GeeksForGeeks!',
            )),
            );
}
}
```

<Manifest> File

```
<queries>
   <intent>
      <action android:name="android.intent.action.VIEW" />
      <category android:name="android.intent.category.BROWSABLE" />
      <data android:scheme="https" />
   </intent>
</queries>
```

Then the following should word - for flutter 3 upwards:

```
const uri = Uri.parse("https://flutter.io");
if (await canLaunchUrl(uri)){
await launchUrl(uri);
}
else {
   // can't launch url
} or for older versions of flutter use this instead:
const url = "https://flutter.io";
if (await canLaunch(url)){     await launch(url);
}
```

Pubspec.yaml

```
import 'package:flutter/material.dart';
import 'package:url_launcher/url_launcher.dart';
void main() {
 runApp(     MaterialApp(         home: Scaffold(       appBar: AppBar(title: Text('Flutter is beautiful'),),       body: Center(          child:
```

```
RaisedButton(          onPressed: _launchURL,          child: Text('Show Flutter homepage'),
        ),
      ),
    )),
  );
}
_launchURL() async {
const url = 'https://flutter.dev';
if (await canLaunchUrl(Uri.parse(url))) {     await launchUrl(Uri.parse(url));    }
else {     throw 'Could not launch $url';
  }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools">
   <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.Calculator"        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>
<meta-data               android:name="android.app.lib_name"
android:value="" />
```

```
        </activity>
    </application>
</manifest>
```

Output:-