1.

```
<AbsoluteLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="NAME: VEDANT\nAGE: 18\nMOBILE NO.: 8182828929"
        android:layout_x="130dp"
        android:layout_y="350dp"/>
</AbsoluteLayout>
```

2.

activity_main.xml

```
<TableLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TableRow>
        <EditText
            android:id="@+id/etNumber1"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Enter First Number"/>
    </TableRow>
    <TableRow>
        <EditText
            android:id="@+id/etNumber2"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Enter Second Number"/>
    </TableRow>
<TableRow>
<TableLayout
```

```
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TableRow>
        <Button android:id="@+id/btnAdd" android:text="+" />
        <Button android:id="@+id/btnSub" android:text="-" />
        <Button android:id="@+id/btnMul" android:text="*" />
        <Button android:id="@+id/btnDiv" android:text="/" />
    </TableRow>
    <TableRow>
        <TextView
            android:id="@+id/tvResult"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Result:"
            android:textSize="20sp"/>
    </TableRow>
</TableLayout>
    </TableRow>
</TableLayout>
```

MainActivity.java

```
package com.example.practicals;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    EditText etNumber1, etNumber2;
    TextView tvResult;
    Button btnAdd, btnSub, btnMul, btnDiv;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_main);
        etNumber1 = findViewById(R.id.etNumber1);
        etNumber2 = findViewById(R.id.etNumber2);
        tvResult = findViewById(R.id.tvResult);

        btnAdd = findViewById(R.id.btnAdd);
        btnSub = findViewById(R.id.btnSub);
        btnMul = findViewById(R.id.btnMul);
        btnDiv = findViewById(R.id.btnDiv);

        btnAdd.setOnClickListener(v -> calculate('+'));
        btnSub.setOnClickListener(v -> calculate('-'));
        btnMul.setOnClickListener(v -> calculate('*'));
        btnDiv.setOnClickListener(v -> calculate('/'));
    }
    void calculate(char operator) {
        try {
            double num1 =
Double.parseDouble(etNumber1.getText().toString());
            double num2 =
Double.parseDouble(etNumber2.getText().toString());
            double result = 0;

            switch (operator) {
                case '+': result = num1 + num2; break;
                case '-': result = num1 - num2; break;
                case '*': result = num1 * num2; break;
                case '/':
                    if (num2 != 0) result = num1 / num2;
                    else {
                        tvResult.setText("Error: Division by Zero");
                        return;
                    }
                    break;
            }
```

```
            tvResult.setText("Result: " + result);
        } catch (NumberFormatException e) {
            tvResult.setText("Error: Enter valid numbers");
        }
    }
}
```

3.

activity_main.xml

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="300dp"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:layout_gravity="center">
    <EditText
        android:id="@+id/ed1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Username"/>
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ed2"
        android:hint="Enter Password"/>
    <Button
        android:id="@+id/btn"
        android:text="LOG-IN"
        android:layout_gravity="center"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

MainActivity.java

```
public class MainActivity extends AppCompatActivity {
   @SuppressLint("MissingInflatedId")
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      EditText ed1=findViewById(R.id.ed1);
      EditText ed2=findViewById(R.id.ed2);
      Button b1=findViewById(R.id.btn);
      b1.setOnClickListener(v->{
            String username = ed1.getText().toString();
            String password = ed2.getText().toString();
            String msg = "";
            if (username.equals("DragonRage") && password.equals("VB@413")) {
               attempts = 0;
               msg = "Login Successful!";
            } else {
               msg = "Login Unsuccessful!";
            }
            Toast.makeText(getApplicationContext(),msg,Toast.LENGTH_SHORT).show();
        });
      }
}
```

4.

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

```
<?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:paddingLeft="10dp"
android:paddingRight="10dp">
<Button
android:id="@+id/btnOn"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Turn On" android:layout_marginLeft="100dp" android:layout_margi
nTop="200dp" />
<Button
android:id="@+id/btnOFF"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignBottom="@+id/btnOn"
android:layout_toRightOf="@+id/btnOn"
android:text="Turn OFF" />
</RelativeLayout>

public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
Button btntOn = (Button)findViewById(R.id.btnOn);
Button btntOff = (Button)findViewById(R.id.btnOFF);
final BluetoothAdapter bAdapter = BluetoothAdapter.getDefaultAdapter();
btntOn.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
if(bAdapter == null)
```

```
{
Toast.makeText(getApplicationContext(),"Bluetooth Not Supported",Toas
t.LENGTH_SHORT).show();
}
else{
if(!bAdapter.isEnabled()){
startActivityForResult(new Intent(BluetoothAdapter.ACTION_REQUEST
_ENABLE),1);
Toast.makeText(getApplicationContext(),"Bluetooth Turned ON",Toas
t.LENGTH_SHORT).show();
}
}
}
});
btntOff.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
bAdapter.disable();
Toast.makeText(getApplicationContext(),"Bluetooth Turned OFF", Toast.
LENGTH_SHORT).show();
}
});
}
}
```

6.

```
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical">
```

```
<TableLayout
   android:layout_gravity="center"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content">
   <TableRow>
      <TextView
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_margin="15dp"
         android:text="NAME"/>
      <TextView
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_margin="15dp"
         android:text="ROLL NO."/>
      <TextView
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_margin="15dp"
         android:text="MARKS"/>
   </TableRow>
   <TableRow>
      <TextView
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_margin="15dp"
         android:text="Vedant"/>
      <TextView
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:layout_margin="15dp"
```

```
            android:text="2403"/>
        <TextView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="15dp"
            android:text="99"/>
    </TableRow>
  </TableLayout>
</LinearLayout>
```

7.

```
package com.example.practicals;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.GridView;

import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    GridView gv;
    String b[]=new String[15];
    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        gv=findViewById(R.id.gv);
        for(int i=0;i<15;i++)
            b[i]="Button "+i;
        ArrayAdapter<String> adp=new
ArrayAdapter<>(this,android.R.layout.simple_list_item_1,b);
        gv.setAdapter(adp);
    }
}
```

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">
    <GridView
        android:id="@+id/gv"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:numColumns="3"/>
</LinearLayout>
```

8.

9.

10.

```
package com.example.myapplication;

import android.annotation.SuppressLint;
import android.os.Bundle;

import com.google.android.material.snackbar.Snackbar;

import androidx.appcompat.app.AppCompatActivity;

import android.view.View;

import androidx.navigation.NavController;
import androidx.navigation.Navigation;
import androidx.navigation.ui.AppBarConfiguration;
import androidx.navigation.ui.NavigationUI;

import com.example.myapplication.databinding.ActivityMainBinding;

import android.view.Menu;
import android.view.MenuItem;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.CompoundButton;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    int ids[]={R.id.c1, R.id.c2, R.id.c3, R.id.c4, R.id.c5};
    CheckBox c[]=new CheckBox[5];
    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button b1=findViewById(R.id.show);
        for(int i=0;i<5;i++)
            c[i]=findViewById(ids[i]);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String msg="";
                for(int i=0;i<5;i++)
                {
                    if(c[i].isChecked())
                        msg+=c[i].getText().toString()+" ";
                }

Toast.makeText(getApplicationContext(),msg,Toast.LENGTH_LONG).show();
            }
        });
    }
}
```

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">
    <CheckBox
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="check1"
        android:id="@+id/c1"/>
    <CheckBox
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="check2"
        android:id="@+id/c2"/>
    <CheckBox
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="check3"
        android:id="@+id/c3"/>
    <CheckBox
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="check4"
        android:id="@+id/c4"/>
    <CheckBox
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="check5"
        android:id="@+id/c5"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SUBMIT"
        android:id="@+id/show"/>
</LinearLayout>
```

11.

```
package com.example.practicals;

import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.AutoCompleteTextView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    AutoCompleteTextView autoCompleteTextView;

    String[] searchSuggestions = {
            "Android Studio", "Java Programming", "Kotlin Tutorial",
            "Python Basics", "Machine Learning", "Deep Learning",
            "Artificial Intelligence", "Data Structures",
            "Algorithms", "Android Development",
            "ChatGPT", "Google Search", "Stack Overflow"
    };
```

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

        autoCompleteTextView = findViewById(R.id.autoCompleteTextView);

        // Adapter to connect suggestions to AutoCompleteTextView
        ArrayAdapter<String> adapter = new ArrayAdapter<>(
                this, android.R.layout.simple_dropdown_item_1line,
searchSuggestions);

        autoCompleteTextView.setAdapter(adapter);
        autoCompleteTextView.setThreshold(1);  // start suggesting after 1
character

        // Optional: Show Toast when user selects a suggestion
        autoCompleteTextView.setOnItemClickListener((parent, view,
position, id) -> {
            String selected = (String) parent.getItemAtPosition(position);
            Toast.makeText(MainActivity.this, "Searching for: " + selected,
Toast.LENGTH_SHORT).show();
        });
    }
}
```

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="20dp">

    <AutoCompleteTextView
        android:id="@+id/autoCompleteTextView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Search here..."/>

</LinearLayout>
```

12.

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Single Radio Buttons"
        android:layout_gravity="center"
        android:layout_marginTop="10dp"/>
    <RadioButton
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Radio Button 1"
```

```
        android:id="@+id/srd1"/>
    <RadioButton
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Radio Button 2"
        android:id="@+id/srd2"/>
    <TextView
        android:layout_width="match_parent"
        android:layout_height="3dp"
        android:background="@color/black"/>
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Radio button inside RadioGroup"
        android:layout_gravity="center"
        android:layout_marginTop="10dp"/>
    <RadioGroup
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/rg">
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Male"
            android:id="@+id/r1"/>
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Female"
            android:id="@+id/r2"/>
    </RadioGroup>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SHOW SELECTED"
        android:layout_gravity="center"
        android:id="@+id/b1"/>
</LinearLayout>
```

```
package com.example.radiobutton;

import android.annotation.SuppressLint;
import android.os.Bundle;

import com.google.android.material.snackbar.Snackbar;

import androidx.appcompat.app.AppCompatActivity;

import android.view.View;

import androidx.navigation.NavController;
import androidx.navigation.Navigation;
import androidx.navigation.ui.AppBarConfiguration;
import androidx.navigation.ui.NavigationUI;

import com.example.radiobutton.databinding.ActivityMainBinding;

import android.view.Menu;
import android.view.MenuItem;
import android.widget.Button;
```

```
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    int ids[]={R.id.srd1,R.id.srd2,R.id.r1,R.id.r2};
    RadioButton rbs[]=new RadioButton[4];
    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        for(int i=0;i<4;i++)
            rbs[i]=findViewById(ids[i]);
        Button b1=findViewById(R.id.b1);
        RadioGroup rg=findViewById(R.id.rg);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String msg="";
                for(int i=0;i<4;i++)
                {
                    if(rbs[i].isChecked())
                        msg+=rbs[i].getText().toString()+" ";
                }

Toast.makeText(getApplicationContext(),msg,Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

13.

```
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="20dp">
    <ProgressBar
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"/>
</RelativeLayout>
```

14.

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:layout_gravity="center">
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:id="@+id/btn"
        android:text="DOWNLOAD FILE"/>
</LinearLayout>
```

```java
package com.example.progressbar;

import android.annotation.SuppressLint;
import android.app.ProgressDialog;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    ProgressDialog pd;
    int status=0;
    Handler h=new Handler();
    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button b=findViewById(R.id.btn);
        b.setOnClickListener(v -> showProgress());
    }
    void showProgress()
    {
        pd=new ProgressDialog(this);
        pd.setMax(100);
        pd.setMessage("File downloading...");
        pd.setProgressStyle(ProgressDialog.STYLE_HORIZONTAL);
        pd.setCancelable(false);
        pd.show();
        new Thread(()->{
            while(status<100)
            {
                status+=1;
                h.post(()->pd.setProgress(status));
                try
                {
                    Thread.sleep(100);
                }
                catch(InterruptedException e)
                {
                    e.printStackTrace();
                }
            }
            pd.dismiss();
            status=0;
        }).start();
    }
}
```

15.

```
package com.example.listview;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    String
lst[]={"Android","Java","Php","Hadoop","Sap","Python","Ajax","C++","Ruby","
Rails"};
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ListView lv=findViewById(R.id.lv);
        ArrayAdapter<String> ad=new
ArrayAdapter<>(this,android.R.layout.simple_list_item_1,lst);
        lv.setAdapter(ad);
        lv.setOnItemClickListener((AdapterView<?> parent, View view, int
position, long id) ->{
                Toast.makeText(getApplicationContext(),(String)
parent.getItemAtPosition(position),Toast.LENGTH_SHORT).show();
        });
    }
}
```

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <ListView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/lv"/>
</LinearLayout>
```

16.

```
package com.example.imageview;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button b1=findViewById(R.id.btn);
        ImageView iv=findViewById(R.id.img);
        b1.setOnClickListener(new View.OnClickListener() {
            boolean status=true;
            @Override
            public void onClick(View v) {
                if(status)
                    iv.setImageResource(R.drawable.image2);
                else
                    iv.setImageResource(R.drawable.image1);
                status=!status;
            }
        });
    }
}
```

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:layout_gravity="center">
    <ImageView
        android:id="@+id/img"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:src="@drawable/image1"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="CHANGE IMAGE"
        android:layout_gravity="center"
        android:id="@+id/btn"/>
</LinearLayout>
```

17.

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingLeft="10dp"
    android:paddingRight="10dp">
    <Button
        android:id="@+id/btnTakePicture"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Take a Photo"
        android:textStyle="bold"
        android:layout_centerHorizontal="true"
        android:layout_alignParentBottom="true" />
    <ImageView
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        android:id="@+id/capturedImage"
        android:layout_above="@+id/btnTakePicture"/>
</RelativeLayout>
```

```
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    private Button btnCapture;
    private ImageView imgCapture;
    private static final int Image_Capture_Code = 1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnCapture =(Button)findViewById(R.id.btnTakePicture);
        imgCapture = (ImageView) findViewById(R.id.capturedImage);
        btnCapture.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent cInt = new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
                startActivityForResult(cInt,Image_Capture_Code);
            }
        });
    }
    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent
data) {
        super.onActivityResult(requestCode, resultCode, data);
        if (requestCode == Image_Capture_Code) {
            if (resultCode == RESULT_OK) {
                Bitmap bp = (Bitmap) data.getExtras().get("data");
                imgCapture.setImageBitmap(bp);
            } else if (resultCode == RESULT_CANCELED) {
                Toast.makeText(this, "Cancelled",
Toast.LENGTH_LONG).show();
            }
        }
    }
}
```

18.

```
<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_centerHorizontal="true"
        android:layout_centerVertical="true"
        android:text="hello_world" />
</RelativeLayout>
```

```
public class MainActivity extends Activity implements LocationListener {
    protected LocationManager locationManager;
    protected LocationListener locationListener;
    protected Context context;
    TextView txtLat;
    String lat;
    String provider;
    protected String latitude, longitude;
    protected boolean gps_enabled, network_enabled;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        txtLat = (TextView) findViewById(R.id.textview1);
        locationManager = (LocationManager)
getSystemService(Context.LOCATION_SERVICE);
        if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED &&
ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
            return;
        }

locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0,
this);
    }
    @Override
    public void onLocationChanged(Location location) {
        txtLat = (TextView) findViewById(R.id.textview1);
        txtLat.setText("Latitude:" + location.getLatitude() + ",
Longitude:" + location.getLongitude());
    }
    @Override
    public void onProviderDisabled(String provider) {
        Log.d("Latitude","disable");
    }
    @Override
    public void onProviderEnabled(String provider) {
        Log.d("Latitude","enable");
    }
    @Override
    public void onStatusChanged(String provider, int status, Bundle extras)
{
        Log.d("Latitude","status");
    }
}
```

19.

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

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

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World, Toast Example" />

    <Button
        android:id="@+id/showToastButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Toast" />
</LinearLayout>
```

MainActivity

```
public class MainActivity extends AppCompatActivity {

    Button showToastButton;

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

        showToastButton = findViewById(R.id.showToastButton);

        showToastButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Toast.makeText(MainActivity.this, "Message for you:\nYou
have got mail!", Toast.LENGTH_LONG).show();
            }
        });
    }
}
```

20.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Phno"/>

    <EditText
        android:id="@+id/etPhno"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Msg"/>

    <EditText
```

```
        android:id="@+id/etmsg"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"/>

    <Button
        android:id="@+id/btnSms"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Send SMS"/>

</LinearLayout>
```

SendSms

```
public class MainActivity extends AppCompatActivity {
    SmsReceiver sms = new SmsReceiver();
    EditText et1, et2;
    Button b1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        et1 = findViewById(R.id.etPhno);
        et2 = findViewById(R.id.etmsg);
        b1 = findViewById(R.id.btnSms);
        if (ContextCompat.checkSelfPermission(MainActivity.this,
Manifest.permission.SEND_SMS) != PackageManager.PERMISSION_GRANTED)
        {
            ActivityCompat.requestPermissions(MainActivity.this, new
String[]{Manifest.permission.SEND_SMS}, 100);
        }
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                try {
                    String phno = et1.getText().toString();
                    String msg = et2.getText().toString();
                    SmsManager smsManager = SmsManager.getDefault();
                    smsManager.sendTextMessage(phno, null, msg, null,
null);
                    Toast.makeText(MainActivity.this, "Sms sent
successfully", Toast.LENGTH_LONG).show();
                } catch (Exception e) {
                    Toast.makeText(MainActivity.this, "Sms failed to
send... try again", Toast.LENGTH_LONG).show();
                }
            }
        });
    }

    @Override
    protected void onStart() {
        super.onStart();
        IntentFilter filter = new
IntentFilter("android.provider.Telephony.SMS_RECEIVED");
        registerReceiver(sms, filter);
    }

    @Override
```

```
    protected void onStop() {
        super.onStop();
        unregisterReceiver(sms);
    }
}
```

ReceiveSms

```
public class SmsReceiver extends BroadcastReceiver {
    SmsReceiver() {
    }

    @Override
    public void onReceive(Context context, Intent intent) {
        Bundle bundle = intent.getExtras();
        if (bundle != null) {
            Object[] sms = (Object[]) bundle.get("pdus");
            for (int i = 0; i < sms.length; i++) {
                SmsMessage smsMessage = SmsMessage.createFromPdu((byte[])
sms[i]);
                String phone = smsMessage.getOriginatingAddress();
                String message = smsMessage.getMessageBody().toString();
                Toast.makeText(context, "Received From" + phone + ": " +
message, Toast.LENGTH_SHORT).show();
            }
        }
    }
}
```

21.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:gravity="center"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello, World!" />
</LinearLayout>
```

MainActivity

```
 public class MainActivity extends AppCompatActivity {

    private static final String TAG = "HelloWorldActivity";

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Log.d(TAG, "onCreate: Activity Created");
    }
    @Override
    protected void onStart() {
        super.onStart();
```

```
        Log.d(TAG, "onStart: Activity Started");
    }
    @Override
    protected void onResume() {
        super.onResume();
        Log.d(TAG, "onResume: Activity Resumed");
    }
    @Override
    protected void onPause() {
        super.onPause();
        Log.d(TAG, "onPause: Activity Paused");
    }
    @Override
    protected void onStop() {
        super.onStop();
        Log.d(TAG, "onStop: Activity Stopped");
    }
    @Override
    protected void onRestart() {
        super.onRestart();
        Log.d(TAG, "onRestart: Activity Restarted");
    }
    @Override
    protected void onDestroy() {
        super.onDestroy();
        Log.d(TAG, "onDestroy: Activity Destroyed");
    }
}
```

22.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <EditText
        android:id="@+id/urlEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter URL" />

    <Button
        android:id="@+id/navigateButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Navigate" />
</LinearLayout>
```

MainActivity

```
public class MainActivity extends AppCompatActivity {

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

```
        urlEditText = findViewById(R.id.urlEditText);
        navigateButton = findViewById(R.id.navigateButton);
        navigateButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String url = urlEditText.getText().toString().trim();
                if (!url.startsWith("http://") &&
!url.startsWith("https://")) {
                    url = "http://" + url;
                }
                try {
                    Intent intent = new Intent(Intent.ACTION_VIEW,
Uri.parse(url));
                    startActivity(intent);
                } catch (Exception e) {
                    Toast.makeText(MainActivity.this, "Invalid URL",
Toast.LENGTH_SHORT).show();
                }
            }
        });
    }
}
```

23.

Refer to code no. 3

24.

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="300dp"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:layout_gravity="center">
    <EditText
        android:id="@+id/ed1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Username"/>
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ed2"
        android:hint="Enter Password"/>
    <Button
```

```
        android:id="@+id/btn"
        android:text="LOG-IN"
        android:layout_gravity="center"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

MainActivity

```
public class MainActivity extends AppCompatActivity {
    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        EditText ed1=findViewById(R.id.ed1);
        EditText ed2=findViewById(R.id.ed2);
        Button b1=findViewById(R.id.btn);
        b1.setOnClickListener(new View.OnClickListener(){
            int attempts=0;
            @Override
            public void onClick(View v) {
                String username = ed1.getText().toString();
                String password = ed2.getText().toString();
                String msg = "";
                if (username.isEmpty() || password.isEmpty())
                    msg = "Username & Password Required!";
                else if (username.length() < 5 || password.length() < 5)
                    msg = "Username & Password must contain >5 characters";
                else if (username.equals("DragonRage") &&
password.equals("VB@413")) {
                    attempts = 0;
                    msg = "Login Successful!";
                } else {
                    attempts += 1;
                    msg = "Login Unsuccessful!";
```

```
                    msg+="\nAttempts: "+attempts;
                }

Toast.makeText(getApplicationContext(),msg,Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

25.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/et_source"
        android:hint="Enter Source Location" />
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/et_destination"
        android:hint="Enter Destination Location" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/track"
        android:text="Draw Route"/>
</LinearLayout>
```

MainActivity

```
public class MainActivity extends AppCompatActivity {
    EditText source, destination;
    Button track;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        source = findViewById(R.id.et_source);
        destination = findViewById(R.id.et_destination);
        track = findViewById(R.id.track);
        track.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String sSource = source.getText().toString();
                String sDestination = destination.getText().toString();
                if(sSource.equals("") && sDestination.equals("")){
                    Toast.makeText(MainActivity.this,"Enter Both
Location",Toast.LENGTH_SHORT).show();
                }
                else{
```

```
                    DisplayTrack(sSource,sDestination);
                }
            }
        });
    }
    private void DisplayTrack(String sSource, String sDestination) {
            Uri uri =
Uri.parse("https://www.google.co.in/maps/dir/"+sSource+"/"+sDestination);
            Intent intent = new Intent(Intent.ACTION_VIEW,uri);
            intent.setPackage("com.google.android.apps.maps");
            intent.setFlags(Intent.FLAG_ACTIVITY_NEW_TASK);
            startActivity(intent);
        }
    }
```

26.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >

    <EditText
        android:id="@+id/editText1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="email id"/>

    <EditText
        android:id="@+id/editText2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="subject"/>

    <EditText
        android:id="@+id/editText3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="body"/>

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SEND" />
</LinearLayout>
```

MainActivity

```
public class MainActivity extends AppCompatActivity {
    // define objects for edit text and button
    Button button;
    EditText sendto, subject, body;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        sendto = findViewById(R.id.editText1);
        subject = findViewById(R.id.editText2);
```

```
        body = findViewById(R.id.editText3);
        button = findViewById(R. id. button);

        button.setOnClickListener(view -> {
            String emailsend = sendto.getText().toString();
            String emailsubject = subject.getText().toString();
            String emailbody = body.getText().toString();

            Intent intent = new Intent(Intent. ACTION_SEND);
            intent.putExtra(Intent.EXTRA_EMAIL, new String[] {emailsend});
            intent.putExtra(Intent.EXTRA_SUBJECT, emailsubject);
            intent.putExtra(Intent.EXTRA_TEXT, emailbody);

            intent.setType("message/rfc822");
            startActivity(Intent.createChooser(intent, "Choose an Email
client :"));
        });
    }
}
```

27.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center">
    <ImageView
        android:id="@+id/imgvw"
        android:layout_width="250dp"
        android:layout_height="250dp"
        android:src="@drawable/potato"
        android:layout_gravity="center"/>
    <Button
        android:id="@+id/btnRotate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Rotate Clock/Anti-Clock" />
    <Button
        android:id="@+id/btnZoom"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Zoom In/Out" />
    <Button
        android:id="@+id/btnFade"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Fade In/Out" />
</LinearLayout>
```

```
<?xml version="1.0" encoding="utf-8"?>
<rotate xmlns:android="http://schemas.android.com/apk/res/android"
    android:fromDegrees="0"
    android:toDegrees="360"
    android:pivotX="50%"
    android:pivotY="50%"
    android:duration="1000" />
```

```xml
<?xml version="1.0" encoding="utf-8"?>
<scale xmlns:android="http://schemas.android.com/apk/res/android"
    android:fromXScale="1.0"
    android:toXScale="2.0"
    android:fromYScale="1.0"
    android:toYScale="2.0"
    android:pivotX="50%"
    android:pivotY="50%"
    android:duration="500" />
```

```xml
<?xml version="1.0" encoding="utf-8"?>
<alpha xmlns:android="http://schemas.android.com/apk/res/android"
    android:fromAlpha="1.0"
    android:toAlpha="0.0"
    android:duration="800" />
```

```java
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    Button btnRotate;
    Button btnZoom;
    Button btnFade;
    ImageView imgvw;
    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnRotate = findViewById(R.id.btnRotate);
        btnZoom = findViewById(R.id.btnZoom);
        btnFade = findViewById(R.id.btnFade);
        imgvw = findViewById(R.id.imgvw);
        btnRotate.setOnClickListener(v -> {
```

```
            Animation rot =
AnimationUtils.loadAnimation(getApplicationContext(), R.anim.rotate);
            imgvw.startAnimation(rot);
        });
        btnZoom.setOnClickListener(v -> {
            Animation zom =
AnimationUtils.loadAnimation(getApplicationContext(), R.anim.zoom);
            imgvw.startAnimation(zom);
        });
        btnFade.setOnClickListener(v -> {
            Animation fde =
AnimationUtils.loadAnimation(getApplicationContext(), R.anim.fade);
            imgvw.startAnimation(fde);
        });
    }
}
```

28.

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_height="match_parent"
    android:layout_width="wrap_content"
    android:layout_gravity="center"
    android:orientation="vertical">
    <CheckBox
        android:id="@+id/c1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Pizza"/>
    <CheckBox
        android:id="@+id/c2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Coffee"/>
    <CheckBox
        android:id="@+id/c3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Burger"/>
    <Button
        android:id="@+id/btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="ORDER"/>
</LinearLayout>
```

```
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
```

```
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        int ids[]={R.id.c1,R.id.c2,R.id.c3};
        Button b1=findViewById(R.id.btn);
        CheckBox c[]=new CheckBox[3];
        int prices[]={150,50,120};
        for(int i=0;i<3;i++)
            c[i]=findViewById(ids[i]);
        b1.setOnClickListener(v->{
            String msg="Selected Items:\n";
            int total=0;
            for(int i=0;i<3;i++)
            {
                if(c[i].isChecked())
                {
                    msg=msg+c[i].getText().toString()+" "+prices[i]+"\n";
                    total=total+prices[i];
                }
            }
            msg=msg+"Total: "+total;

Toast.makeText(getApplicationContext(),msg,Toast.LENGTH_SHORT).show();
        });
    }
}
```

29.

```
<?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:gravity="center">

    <Button
        android:id="@+id/dialerButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="Start Dialer" />
</LinearLayout>
```

```
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

        Button dialerButton = findViewById(R.id.dialerButton);
        dialerButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent intent = new Intent(Intent.ACTION_DIAL);
                startActivity(intent);
            }
        });
    }
}
```

30.

```
<?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:gravity="center">
```

```
    <EditText
        android:id="@+id/inputNum"
        android:hint="Enter a number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>
    <Button
        android:id="@+id/factorialButton"
        android:text="Factorial"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />
</LinearLayout>
```

```
<?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:gravity="center">
    <TextView
        android:id="@+id/factorialResult"
        android:textSize="20sp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

```
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    EditText inputNumber;
```

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

        inputNumber = findViewById(R.id.inputNum);
        Button factorialButton = findViewById(R.id.factorialButton);

        factorialButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String numStr = inputNumber.getText().toString();
                if (!numStr.isEmpty()) {
                    int number = Integer.parseInt(numStr);
                    Intent intent = new Intent(MainActivity.this,
ResultActivity.class);
                    intent.putExtra("number", number);  // Send number
                    startActivity(intent);
                }
            }
        });
    }
}
```

```
package com.example.myapplication;

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

import androidx.appcompat.app.AppCompatActivity;

public class ResultActivity extends AppCompatActivity {

    TextView resultView;

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

        resultView = findViewById(R.id.factorialResult);

        int number = getIntent().getIntExtra("number", 0);
        long fact = 1;
        for (int i = 1; i <= number; i++) {
            fact *= i;
        }

        resultView.setText("Factorial of " + number + " is: " + fact);
    }
}
```

31.

```
<?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:gravity="center">
    <Button
        android:id="@+id/start"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Start Service" />
    <Button
        android:id="@+id/stop"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Stop Service" />
</LinearLayout>
```

```
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    Button startServiceBtn, stopServiceBtn;

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

        startServiceBtn = findViewById(R.id.start);
        stopServiceBtn = findViewById(R.id.stop);

        startServiceBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(MainActivity.this,
MyService.class);
```

```
                startService(intent);
            }
        });

        stopServiceBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(MainActivity.this,
MyService.class);
                stopService(intent);
            }
        });
    }
}
```

```
package com.example.myapplication;

import android.app.Service;
import android.content.Intent;
import android.os.IBinder;
import android.widget.Toast;

import androidx.annotation.Nullable;

public class MyService extends Service {

    @Nullable
    @Override
    public IBinder onBind(Intent intent) {
        return null; // Not using bound service
    }

    @Override
    public void onStart(Intent intent, int startId) {
        super.onStart(intent, startId);
        Toast.makeText(this, "Service Started", Toast.LENGTH_SHORT).show();
    }

    @Override
    public void onDestroy() {
        super.onDestroy();
        Toast.makeText(this, "Service Stopped", Toast.LENGTH_SHORT).show();
    }
}
```

32.

```
<?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:gravity="center"
    android:orientation="vertical"
    android:padding="16dp">

    <Button
        android:id="@+id/sendBroadcast"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="Send Custom Broadcast" />
</LinearLayout>
```

```
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    public static final String CUSTOM_ACTION =
"com.example.CUSTOM_BROADCAST";

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

        Button sendBroadcast = findViewById(R.id.sendBroadcast);
        sendBroadcast.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent intent = new Intent(CUSTOM_ACTION);
                intent.putExtra("msg", "Hello from custom broadcast!");
                sendBroadcast(intent);
            }
        });
    }
}
```

```
package com.example.myapplication;

import android.content.BroadcastReceiver;
import android.content.Context;
```

```
import android.content.Intent;
import android.widget.Toast;

public class CustomReceiver extends BroadcastReceiver {

    @Override
    public void onReceive(Context context, Intent intent) {
        if (MainActivity.CUSTOM_ACTION.equals(intent.getAction())) {
            String message = intent.getStringExtra("msg");
            Toast.makeText(context, "Received: " + message,
Toast.LENGTH_SHORT).show();
        }
    }
}
```

33.

```
<?xml version="1.0" encoding="utf-8"?>
<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/textView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:text="Shake to switch color" />

</RelativeLayout>
```

```
public class MainActivity extends AppCompatActivity implements
SensorEventListener{
    private SensorManager sensorManager;
    private boolean isColor = false;
    private View view;
    private long lastUpdate;

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        view = findViewById(R.id.textView);
        view.setBackgroundColor(Color.GREEN);

        sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);
        lastUpdate = System.currentTimeMillis();
    }
    //overriding two methods of SensorEventListener
    @Override
    public void onAccuracyChanged(Sensor sensor, int accuracy) {}
    @Override
    public void onSensorChanged(SensorEvent event) {
        if (event.sensor.getType() == Sensor.TYPE_ACCELEROMETER) {
            getAccelerometer(event);
```

```
        }

    }

    private void getAccelerometer(SensorEvent event) {
        float[] values = event.values;
        // Movement
        float x = values[0];
        float y = values[1];
        float z = values[2];

        float accelationSquareRoot = (x * x + y * y + z * z)
                / (SensorManager.GRAVITY_EARTH *
SensorManager.GRAVITY_EARTH);

        long actualTime = System.currentTimeMillis();

Toast.makeText(getApplicationContext(),String.valueOf(accelationSquareRoot)
+" "+
                SensorManager.GRAVITY_EARTH,Toast.LENGTH_SHORT).show();

        if (accelationSquareRoot >= 2) //it will be executed if you shuffle
        {

            if (actualTime - lastUpdate < 200) {
                return;
            }
            lastUpdate = actualTime;//updating lastUpdate for next shuffle
            if (isColor) {
                view.setBackgroundColor(Color.GREEN);

            } else {
                view.setBackgroundColor(Color.RED);
            }
            isColor = !isColor;
        }
    }

    @Override
    protected void onResume() {
        super.onResume();
        // register this class as a listener for the orientation and
        // accelerometer sensors

sensorManager.registerListener(this,sensorManager.getDefaultSensor(Sensor.T
YPE_ACCELEROMETER),
                SensorManager.SENSOR_DELAY_NORMAL);
    }

    @Override
    protected void onPause() {
        // unregister listener
        super.onPause();
        sensorManager.unregisterListener(this);
    }
}
```

34.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical" android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
        android:id="@+id/sensorslist"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sensors"
        android:layout_gravity="center"/>
</LinearLayout>
```

```
public class MainActivity extends AppCompatActivity {

    private SensorManager mgr;
    private TextView txtList;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mgr = (SensorManager)getSystemService(Context.SENSOR_SERVICE);
        txtList = (TextView)findViewById(R.id.sensorslist);
        List<Sensor> sensorList = mgr.getSensorList(Sensor.TYPE_ALL);
        StringBuilder strBuilder = new StringBuilder();
        for(Sensor s: sensorList){
            strBuilder.append(s.getName()+"\n");
        }
        txtList.setVisibility(View.VISIBLE);
        txtList.setText(strBuilder);
    }
}
```

35.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/textview"
        android:text="Bluetooth"
        android:textSize="20dp"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Turn On"
        android:id="@+id/button"
        android:onClick="on" />
    <Button
        android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:text="Get visible"
        android:onClick="visible"
        android:id="@+id/button2" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="List devices"
        android:onClick="list"
        android:id="@+id/button3" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="turn off"
        android:onClick="off"
        android:id="@+id/button4" />
    <ListView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/listView" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Paired devices:"
        android:id="@+id/textView2" />
</LinearLayout>
```

```
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.app.Activity;
import android.bluetooth.BluetoothAdapter;
import android.bluetooth.BluetoothDevice;
import android.content.ActivityNotFoundException;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.util.Log;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.ListView;
import android.widget.TextView;
import android.widget.Toast;
```

```
import java.util.ArrayList;
import java.util.Set;

public class MainActivity extends Activity {
    Button b1, b2, b3, b4;
    private BluetoothAdapter BA;
    private Set<BluetoothDevice> pairedDevices;
    ListView lv;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b1 = (Button) findViewById(R.id.button);
        b2 = (Button) findViewById(R.id.button2);
        b3 = (Button) findViewById(R.id.button3);
        b4 = (Button) findViewById(R.id.button4);
        BA = BluetoothAdapter.getDefaultAdapter();
        lv = (ListView) findViewById(R.id.listView);
    }

    public void on(View v) {
        if (!BA.isEnabled()) {
            Intent turnOn = new
Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
            if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
                ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.BLUETOOTH_CONNECT}, 1);
            }
            startActivityForResult(turnOn, 0);
            Toast.makeText(getApplicationContext(), "Turned on",
Toast.LENGTH_LONG).show();
        } else {
            Toast.makeText(getApplicationContext(), "Already on",
Toast.LENGTH_LONG).show();
        }
    }

    public void off(View v) {
        if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
            return;
        }
        BA.disable();
        Toast.makeText(getApplicationContext(), "Turned off",
Toast.LENGTH_LONG).show();
    }

    public void visible(View v) {
        Intent getVisible = new
Intent(BluetoothAdapter.ACTION_REQUEST_DISCOVERABLE);
        if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.BLUETOOTH_ADVERTISE) !=
PackageManager.PERMISSION_GRANTED) {
            return;
        }
        startActivityForResult(getVisible, 0);
```

```
    }

    public void list(View v) {
        if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
            ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.BLUETOOTH_CONNECT}, 1);
        }
        pairedDevices = BA.getBondedDevices();
        ArrayList list = new ArrayList();
        for (BluetoothDevice bt : pairedDevices) {
            list.add(bt.getName());
        }
        Toast.makeText(getApplicationContext(), "Showing Paired
Devices",Toast.LENGTH_SHORT).show();
        final ArrayAdapter adapter = new
ArrayAdapter(this,android.R.layout.simple_list_item_1, list);
        lv.setAdapter(adapter);
    }
}
```

```
<uses-permission android:name="android.permission.BLUETOOTH_ADVERTISE" />
<uses-permission android:name="android.permission.BLUETOOTH_CONNECT" />
<uses-permission android:name="android.permission.BLUETOOTH"/>
<uses-permission android:name="android.permission.BLUETOOTH_ADMIN"/>
```