

Practical 1: Study Android Architecture, development toolkit, Android Studio, Android Virtual Device.

Android development toolkit

Android Development Tools (ADT) is a plugin for the Eclipse IDE that is designed to give you a powerful, integrated environment in which to build Android applications.

ADT extends the capabilities of Eclipse to let you quickly set up new Android projects, create an application UI, add packages based on the Android Framework API, debug your applications using the Android SDK tools, and even export signed (or unsigned) .apk files in order to distribute your application.

Developing in Eclipse with ADT is highly recommended and is the fastest way to get started. With the guided project setup it provides, as well as tools integration, custom XML editors, and debug output pane, ADT gives you an incredible boost in developing Android applications.

Android studio

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built based on JetBrains IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools (ADT) as primary IDE for native Android application development.

Android Studio was announced on May 16, 2013 at the Google I/O conference. It was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014. The first stable build was released in December 2014, starting from version 1.0. The current stable version is 2.3.3, released in June 2017. Next major update, version 3.0, is in preview stage as of August 2017.

Features

New features are expected to be rolled out with each release of Android Studio. The following features are provided in the current stable version:

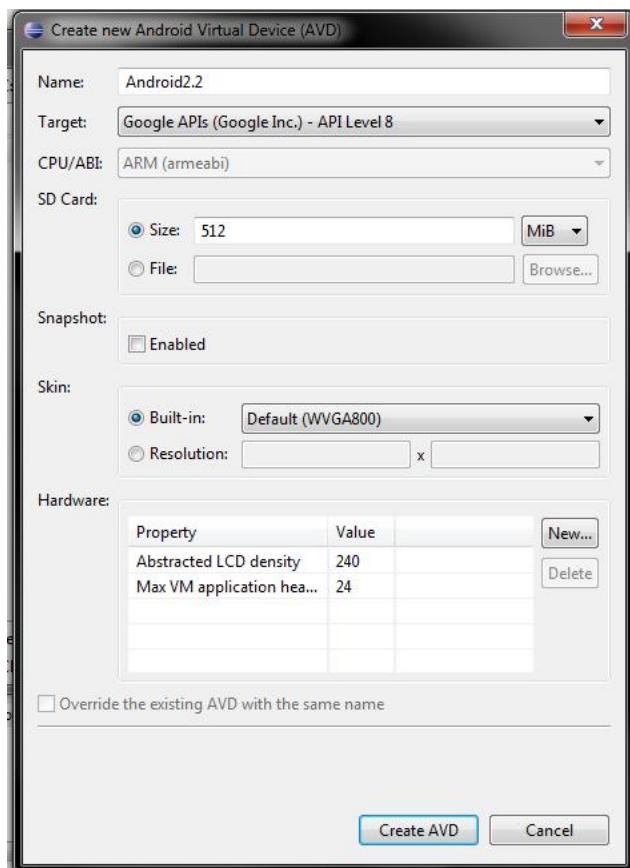
- Powerful code editing (smart editing, code re-factoring)
- Rich layout Editor (As you soon as you drag and drop views on the layout, it shows you preview in all the screens including Nexus 4,Nexus 10 and many other resolutions.
- Gradle-based build support and Maven Support
- Templated based wizards
- Lint tool analysis (The Android lint tool is a static code analysis tool that checks your Android project source files for potential bugs and optimization improvements for correctness, security, performance, usability, accessibility, and internationalization.)

Android virtual device

An Android Virtual Device (AVD) is an emulator configuration that allows developers to test the application by simulating the real device capabilities. We can configure the AVD by specifying the hardware and software options. AVD manager enables an easy way of creating and managing the AVD with its graphical interface. We can create as many AVDs as we need, based on the types of device we want to test for.

Below are the steps to create an AVD from AVD manager graphical interface

1. Go to Window ->AVD Manager and select Virtual Devices.
2. Click on New to create a Virtual Device, give it some Name and select Target Android Platform from the drop-down list
3. Click “Create AVD” and we are done!



API Levels generally mean that as a programmer, you can communicate with the devices' built in functions and functionality. Choosing an API level for an application development should take at least two things into account:

1. Current distribution – How many devices can actually support my application, if it was developed for API level 9, it cannot run on API level 8 and below, then “only” around 60% of devices can run it.
2. Choosing a lower API level may support more devices but gain less functionality for your app. you may also work harder to achieve features you could've easily gained if you chose higher API level.

Practical 2: Create a simple Android Application to display "Hello, welcome to Android Lab" in a text Box and toast it on Button Click.

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">

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="408dp"
        android:onClick="onClick"
        android:text="@string/buttonText"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent" />

    <EditText
        android:id="@+id/editTextTextPersonName"
        android:layout_width="380dp"
        android:layout_height="60dp"
        android:layout_marginBottom="60dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:text="Hello, welcome to android lab!"
        app:layout_constraintBottom_toTopOf="@+id/button"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.631" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.mcwcpractical2;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {

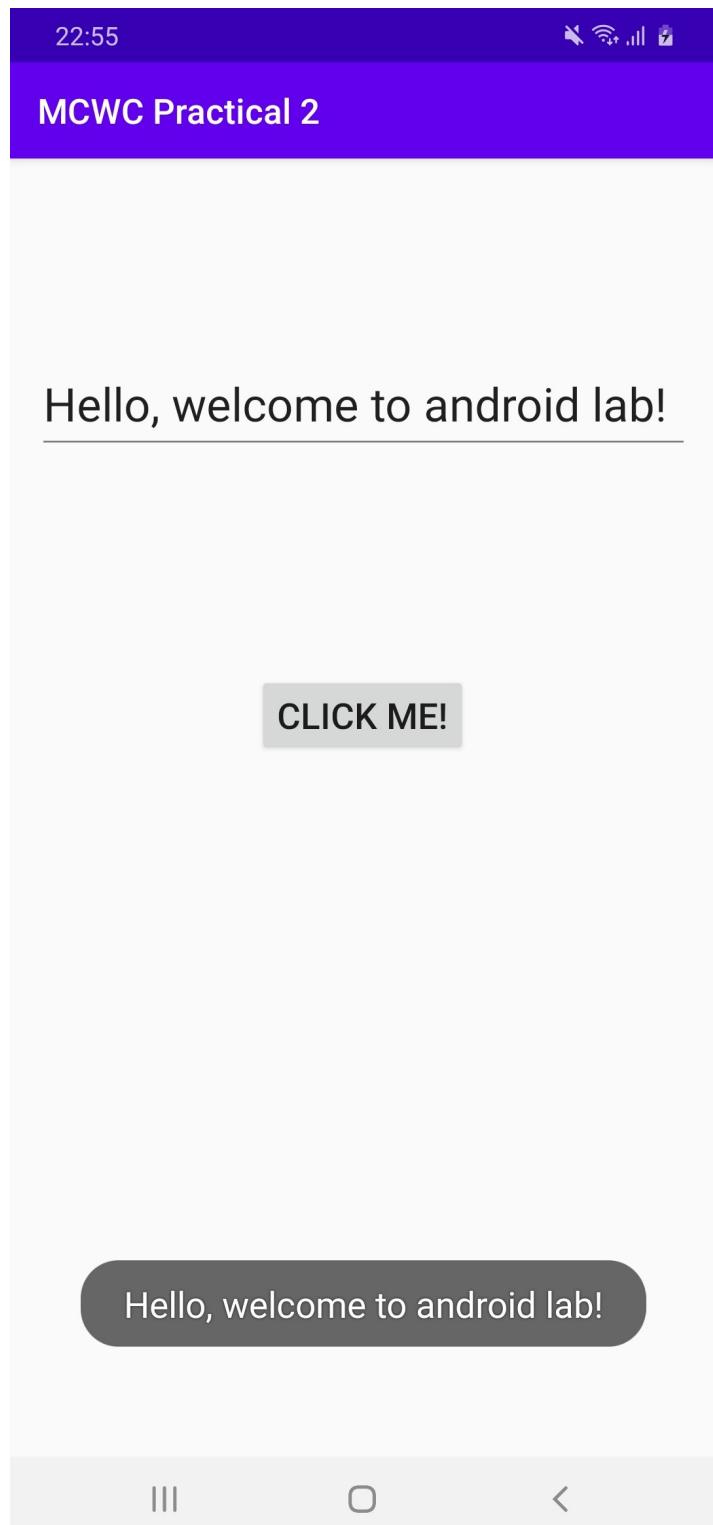
    EditText e1;
    Button b1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = (EditText) findViewById(R.id.editTextTextPersonName);
        b1 = (Button)findViewById(R.id.button);

    }

    public void onClick(View v)
    {
        String msg = e1.getText().toString();
        Toast.makeText(getApplicationContext(),msg,Toast.LENGTH_LONG).show();
    }
}
```

Output:



Practical 3: Create an android application for a simple calculator which has functionality to add, subtract, multiply and divide two numbers.

Activity_main.xml

```
<?xml version="1.0" encoding="UTF-8"?>

<LinearLayout
    android:weightSum="6"
    tools:context=".MainActivity"
    android:background="#F5F5F5"
    android:orientation="vertical"
    android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:android="http://schemas.android.com/apk/res/android">

    <TextView
        android:background="#67C6F1"
        android:layout_height="0dp"
        android:layout_width="match_parent"
        android:layout_marginHorizontal="10dp"
        android:padding="5dp"
        android:layout_marginBottom="30dp"
        android:layout_marginTop="10dp"
        android:textStyle="bold"
        android:textSize="30sp"
        android:layout_weight="1"
        android:gravity="center|right"
        android:id="@+id/screen"
        tools:ignore="RtlHardcoded" />

    <LinearLayout
        android:weightSum="4"
        android:layout_height="0dp"
        android:layout_width="fill_parent"
        android:layout_weight="1">

        <Button
```

```
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#FF0000"
    android:layout_weight="1"
    android:id="@+id/ac"
    android:layout_margin="5dp"
    android:text="@string/ac"
    android:onClick="ButtonClick"
    tools:ignore="NestedWeights,SpUsage" />
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="35dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/power"
    android:layout_margin="5dp"
    android:text="@string/power"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="55dp"
    android:layout_weight="1"
    android:id="@+id/back"
    android:layout_margin="5dp"
    android:text="@string/back"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
```

```
    android:textColor="#000000"  
    android:layout_weight="1"  
    android:id="@+id/div"  
    android:layout_margin="5dp"  
    android:text="@string/div"  
    android:onClick="ButtonClick"  
    tools:ignore="SpUsage" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:weightSum="4"  
    android:layout_height="0dp"  
    android:layout_width="fill_parent" android:layout_weight="1">
```

```
<Button  
    android:background="#FCEC77"  
    android:layout_height="fill_parent"  
    android:layout_width="0dp"  
    android:textSize="30dp"  
    android:textColor="#000000"  
    android:layout_weight="1"  
    android:id="@+id/seven"  
    android:layout_margin="5dp"  
    android:text="@string/seven"  
    android:onClick="ButtonClick"  
    tools:ignore="NestedWeights,SpUsage" />
```

```
<Button  
    android:background="#FCEC77"  
    android:layout_height="fill_parent"  
    android:layout_width="0dp"  
    android:textSize="30dp"  
    android:textColor="#000000"  
    android:layout_weight="1"  
    android:id="@+id/eight"  
    android:layout_margin="5dp"  
    android:text="@string/eight"  
    android:onClick="ButtonClick"  
    tools:ignore="SpUsage" />
```

```
<Button
```

```
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/nine"
    android:layout_margin="5dp"
    android:text="@string/nine"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/mul"
    android:layout_margin="5dp"
    android:text="@string/multiply"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
</LinearLayout>
```

```
<LinearLayout
    android:weightSum="4"
    android:layout_height="0dp"
    android:layout_width="fill_parent"
    android:layout_weight="1">
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/four"
    android:layout_margin="5dp"
```

```
    android:text="@string/four"
    android:onClick="ButtonClick"
    tools:ignore="NestedWeights,SpUsage" />

<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/five"
    android:layout_margin="5dp"
    android:text="@string/five"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />

<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/six"
    android:layout_margin="5dp"
    android:text="@string/six"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />

<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="45dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/min"
    android:layout_margin="5dp"
    android:text="@string/min"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

</LinearLayout>

```
<LinearLayout
    android:weightSum="4"
    android:layout_height="0dp"
    android:layout_width="fill_parent"
    android:layout_weight="1">

    <Button
        android:background="#FCEC77"
        android:layout_height="fill_parent"
        android:layout_width="0dp"
        android:textSize="30dp"
        android:textColor="#000000"
        android:layout_weight="1"
        android:id="@+id/one"
        android:layout_margin="5dp"
        android:text="@string/one"
        android:onClick="ButtonClick"
        tools:ignore="NestedWeights,SpUsage" />

    <Button
        android:background="#FCEC77"
        android:layout_height="fill_parent"
        android:layout_width="0dp"
        android:textSize="30dp"
        android:textColor="#000000"
        android:layout_weight="1"
        android:id="@+id/two"
        android:layout_margin="5dp"
        android:text="@string/two"
        android:onClick="ButtonClick"
        tools:ignore="SpUsage" />

    <Button
        android:background="#FCEC77"
        android:layout_height="fill_parent"
        android:layout_width="0dp"
        android:textSize="30dp"
        android:textColor="#000000"
        android:layout_weight="1"
        android:id="@+id/three"
```

```
    android:layout_margin="5dp"
    android:text="@string/three"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />

<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/plus"
    android:layout_margin="5dp"
    android:text="@string/plus"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />

</LinearLayout>

<LinearLayout
    android:layout_height="0dp"
    android:layout_width="fill_parent"
    android:layout_weight="1">

<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/zero"
    android:layout_margin="5dp"
    android:text="@string/zero"
    android:onClick="ButtonClick"
    tools:ignore="NestedWeights,SpUsage" />

<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
```

```
    android:textSize="45dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/point"
    android:layout_margin="5dp"
    android:text="@string/point"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="30dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/ans"
    android:layout_margin="5dp"
    android:text="@string/ans"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
<Button
    android:background="#FCEC77"
    android:layout_height="fill_parent"
    android:layout_width="0dp"
    android:textSize="40dp"
    android:textColor="#000000"
    android:layout_weight="1"
    android:id="@+id/equal"
    android:layout_margin="5dp"
    android:text="@string/equal"
    android:onClick="ButtonClick"
    tools:ignore="SpUsage" />
```

```
</LinearLayout>
```

```
</LinearLayout>
```

MainActivity.java

```
package com.example.mcwcpractical3;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {

    private TextView screen;
    private Button
ac,power,back,div,mul,plus,min,one,two,three,four,five,six,seven,eight,nine,zero
,ans,point,equal;
    private String input="";
    private boolean clearResult;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        screen=findViewById(R.id.screen);
        ac=findViewById(R.id.ac);
        power=findViewById(R.id.power);
        back=findViewById(R.id.back);
        div=findViewById(R.id.div);
        mul=findViewById(R.id.mul);
        plus=findViewById(R.id.plus);
        min=findViewById(R.id.min);
        one=findViewById(R.id.one);
        two=findViewById(R.id.two);
        three=findViewById(R.id.three);
        four=findViewById(R.id.four);
        five=findViewById(R.id.five);
        six=findViewById(R.id.six);
        seven=findViewById(R.id.seven);
        eight=findViewById(R.id.eight);
        nine=findViewById(R.id.nine);
        zero=findViewById(R.id.zero);
        ans=findViewById(R.id.ans);
```

```
    point=findViewById(R.id.point);
    equal=findViewById(R.id.equal);
}

public void ButtonClick(View view){
    Button button= (Button) view;
    String data=button.getText().toString();
    switch (data)
    {
        case "AC":
            input="";
            break;
        case "Ans":
            clearResult=false;
            input+=Ans;
            break;
        case "x":
            clearResult=false;
            Solve();
            input+="*";
            break;
        case "^":
            clearResult=false;
            Solve();
            input+="^";
            break;
        case "=":
            clearResult=true;
            Solve();
            Ans=input;
            break;
        case "←":
            if(input.length()>0){
                clearResult=false;
                String newText=input.substring(0,input.length()-1);
                input=newText;
            }
            break;
        default:
            if(input==null){
                input="";
            }
            if(data.equals("+") || data.equals("-") || data.equals("/")){

```

```
        clearResult=false;
        Solve();
    }
    else if(clearResult==true){
        input="";
        clearResult=false;
    }
    input+=data;
}
screen.setText(input);
}

public void Solve()
{
    if(input.split("\\*").length==2)
    {
        String[] numbers =input.split("\\*");
        try{
            double
mul=Double.parseDouble(numbers[0])*Double.parseDouble(numbers[1]);
            input=mul+"";
        }
        catch (Exception e){
            //Display error
        }
    }
    else if(input.split("/").length==2)
    {
        String[] numbers =input.split("/");
        try{
            double div;
            div =
Double.parseDouble(numbers[0])/Double.parseDouble(numbers[1]);
            input=div+"";
        }
        catch (Exception e){
            //Display error
        }
    }
    else if(input.split("\\^").length==2)
    {
        String[] numbers =input.split("\\^");
        try{
```

```
    double pow;
    pow =
Math.pow(Double.parseDouble(numbers[0]),Double.parseDouble(numbers[1]))
;
    input=pow+"";
}
catch (Exception e){
    //Display error
}
}

else if(input.split("\\"+").length==2)
{
    String[] numbers =input.split("\\"+");
    try{
        double sum;
        sum =
Double.parseDouble(numbers[0])+Double.parseDouble(numbers[1]);
        input=sum+"";
    }
    catch (Exception e){
        //Display error
    }
}
else if(input.split("\\"-").length>1)
{
    String[] numbers =input.split("\\"-");
    if(numbers[0].equals("") && numbers.length==2){
        numbers[0]=0+"";
    }
    try{
        double sub=0;
        if(numbers.length==2) {
            sub = Double.parseDouble(numbers[0]) -
Double.parseDouble(numbers[1]);
        }
        else if(numbers.length==3){
            sub = -Double.parseDouble(numbers[1]) -
Double.parseDouble(numbers[2]);
        }
        input=sub+"";
    }
    catch (Exception e){
```

```
//Display error
    }
}
String n[]=input.split("\\.");
if(n.length>1){
    if(n[1].equals("0")){
        input=n[0];
    }
}
screen.setText(input);
}
}
```





Practical 4: Create an Android application for Dialog Box in Android.

Activity_main.xml

```
<?xml version="1.0" encoding="UTF-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
    tools:context=".MainActivity"
    android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:android="http://schemas.android.com/apk/res/android">

    <LinearLayout
        android:layout_height="152dp"
        android:layout_width="215dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        android:orientation="vertical" android:id="@+id/linearLayout">

        <TextView
            android:layout_height="54dp"
            android:layout_width="match_parent"
            android:id="@+id/textView"
            android:text="Name"/>

        <TextView
            android:layout_height="46dp"
            android:layout_width="match_parent"
            android:id="@+id/textView2"
            android:text="Account Number"/>

        <TextView
            android:layout_height="49dp"
            android:layout_width="match_parent"
            android:id="@+id/textView3"
            android:text="Address"/>
    
```

```
    android:text="Balance"/>

</LinearLayout>

<LinearLayout
    android:layout_height="149dp"
    android:layout_width="202dp"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintBottom_toBottomOf="parent"
    android:orientation="vertical"
    app:layout_constraintStart_toEndOf="@+id/linearLayout">

    <Button
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:id="@+id/button"
        android:text="View"/>

    <Button
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:id="@+id/button2"
        android:text="View"/>

    <Button
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:id="@+id/button3"
        android:text="View"/>

</LinearLayout>

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

MainActivity.java

```
package com.example.mcwcpractical4;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

import android.annotation.SuppressLint;
import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

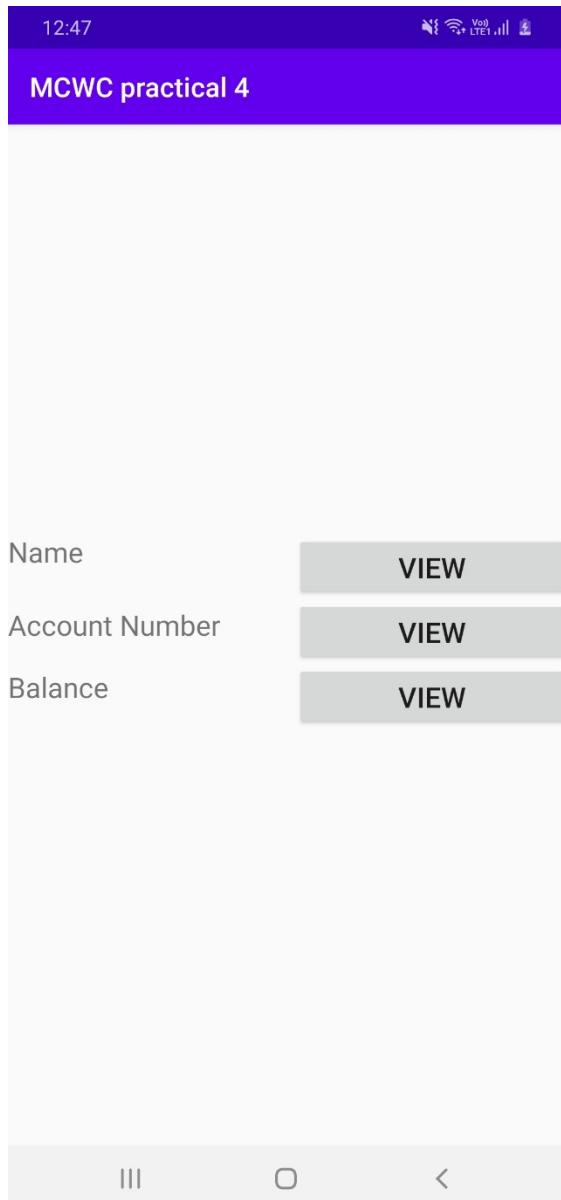
public class MainActivity extends AppCompatActivity {
    private TextView tv1, tv2, tv3;
    private Button btn1, btn2, btn3;

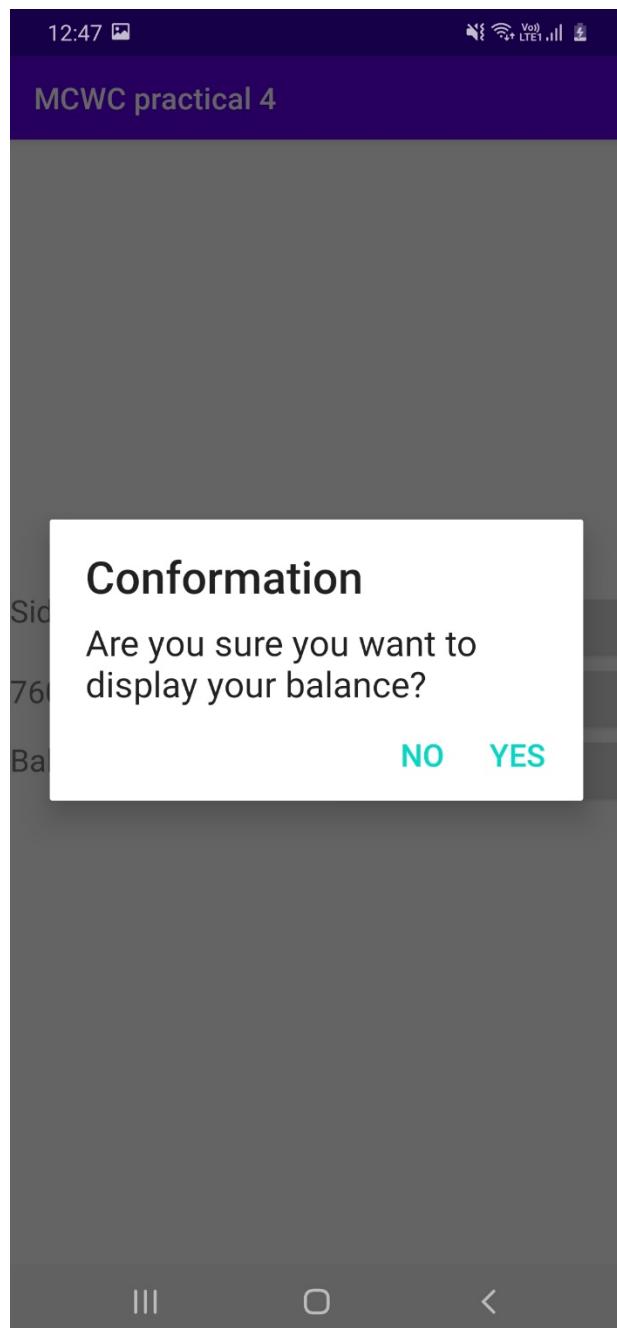
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        tv1 = (TextView) findViewById(R.id.textView);
        tv2 = (TextView) findViewById(R.id.textView2);
        tv3 = (TextView) findViewById(R.id.textView3);
        btn1 = (Button) findViewById(R.id.button);
        btn2 = (Button) findViewById(R.id.button2);
        btn3 = (Button) findViewById(R.id.button3);

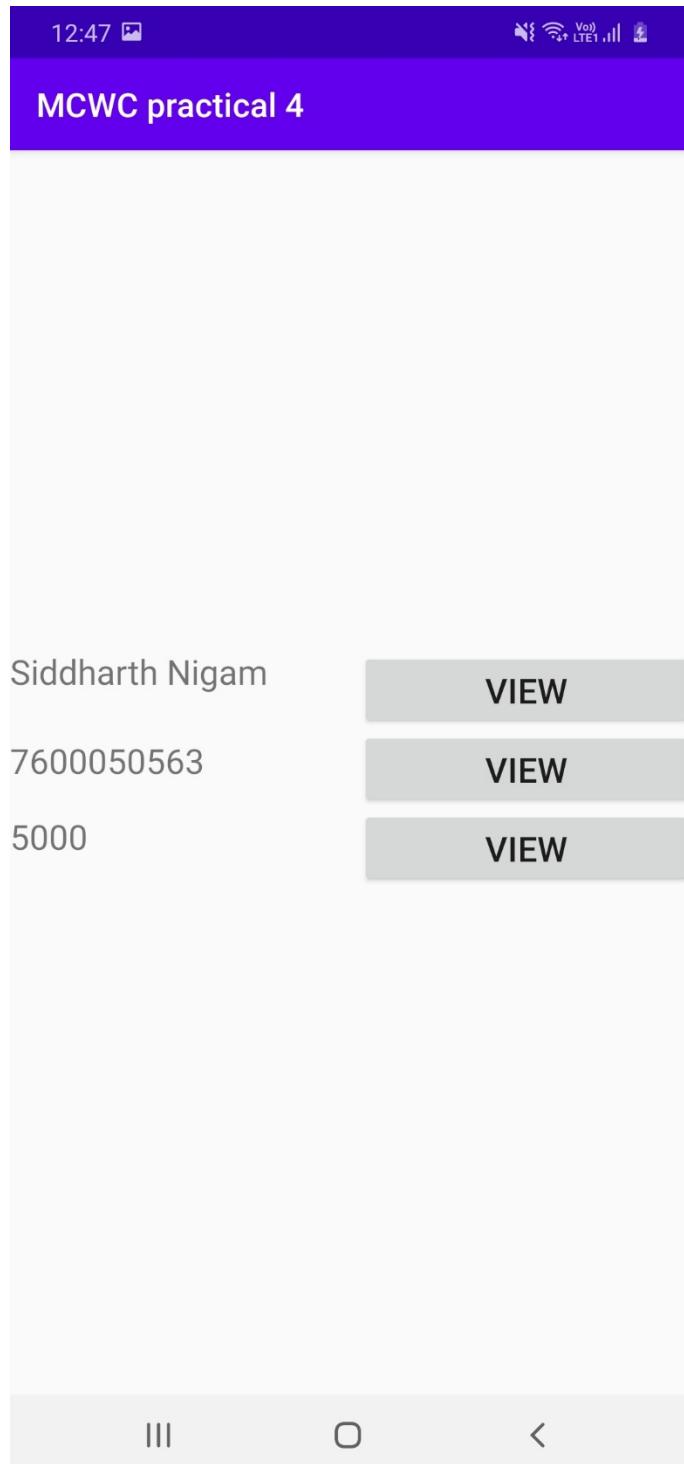
        btn1.setOnClickListener(new View.OnClickListener() {
            @SuppressLint("SetTextI18n")
            @Override
            public void onClick(View view) {
                tv1.setText("Siddharth Nigam");
            }
        });
        btn2.setOnClickListener(new View.OnClickListener() {
            @SuppressLint("SetTextI18n")
            @Override
            public void onClick(View view) {
                tv2.setText("7600050563");
            }
        });
    }
}
```

```
btn3.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        AlertDialog.Builder alt= new AlertDialog.Builder(MainActivity.this);
        alt.setTitle("Conformation");
        alt.setCancelable(false);
        alt.setMessage("Are you sure you want to display your balance?");
        alt.setPositiveButton("Yes", new DialogInterface.OnClickListener() {
            @SuppressLint("SetTextI18n")
            @Override
            public void onClick(DialogInterface dialogInterface, int i) {
                tv3.setText("5000");
            }
        });
        alt.setNegativeButton("No", new DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialogInterface, int i) {
                dialogInterface.cancel();
            }
        });
        AlertDialog alert=alt.create();
        alert.show();
    }
});
```

Output:







Practical 5: Create an android application for list view with multiple choice in android.

Activity_main.xml

```
<?xml version="1.0" encoding="UTF-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
    tools:context=".MainActivity"
    android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:android="http://schemas.android.com/apk/res/android">

    <Button
        android:layout_height="wrap_content"
        android:layout_width="wrap_content"
        app:layout_constraintVertical_bias="0.263"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        android:text="@string/order"
        android:background="#FFEB3B"
        android:id="@+id/button"/>

    <TextView
        android:layout_height="wrap_content"
        android:layout_width="wrap_content"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        android:id="@+id/textView"
        app:layout_constraintTop_toBottomOf="@+id/button"
        android:gravity="center"
        android:textColor="@color/colorPrimary"
        android:textStyle="italic"
        android:textSize="20sp"/>

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

MainActivity.java

```
package com.example.listviewmultipleselection;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

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

import com.example.listviewmultipleselection.R;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {
    Button btn;
    TextView tv;
    String[] menuitems;
    boolean[] checkeditems;
    ArrayList<Integer> useritems=new ArrayList<>();

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

        btn=(Button)findViewById(R.id.button);
        tv=(TextView)findViewById(R.id.textView);
        menuitems=getResources().getStringArray(R.array.menuitems);
        checkeditems=new boolean[menuitems.length];

        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                AlertDialog.Builder adb=new AlertDialog.Builder(MainActivity.this);
                adb.setTitle("Items available in the shop");
                adb.setMultiChoiceItems(menuitems, checkeditems, new
                DialogInterface.OnMultiChoiceClickListener() {
                    @Override
```

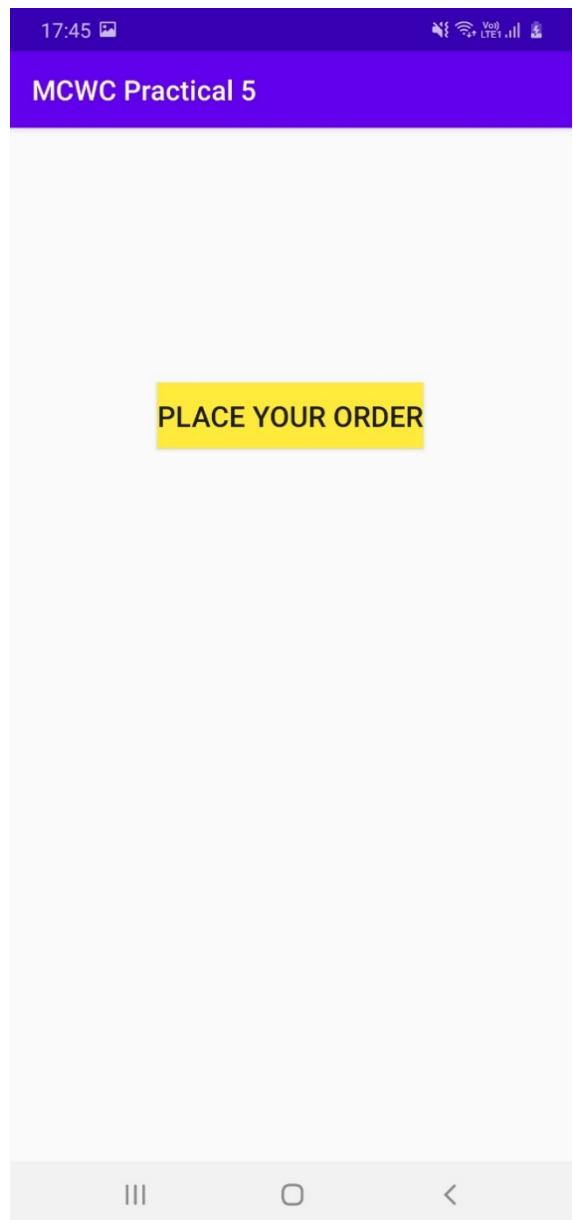
```
        public void onClick(DialogInterface dialogInterface, int position,
boolean isChecked) {
            if(isChecked){
                if(!userItems.contains(position)){
                    userItems.add(position);
                }
            }else if(userItems.contains(position)){
                userItems.remove(position);
            }
        }
    });
adb.setCancelable(false);
adb.setPositiveButton("OK", new DialogInterface.OnClickListener()
{
    @Override
    public void onClick(DialogInterface dialogInterface, int i) {
        String str="";
        for(int k=0;k<userItems.size();k++)
        {
            str=str+ menuItems[userItems.get(k)];
            if(k!=userItems.size()-1){
                str=str+", ";
            }
        }
        tv.setText(str);
    }
});
adb.setNegativeButton("Dismiss", new
DialogInterface.OnClickListener() {
    @Override
    public void onClick(DialogInterface dialogInterface, int i) {
        dialogInterface.dismiss();
    }
});
adb.setNeutralButton("Clear all", new
DialogInterface.OnClickListener() {
    @Override
    public void onClick(DialogInterface dialogInterface, int i) {
        for(int j=0;j<checkedItems.length;j++)
    }
});
```

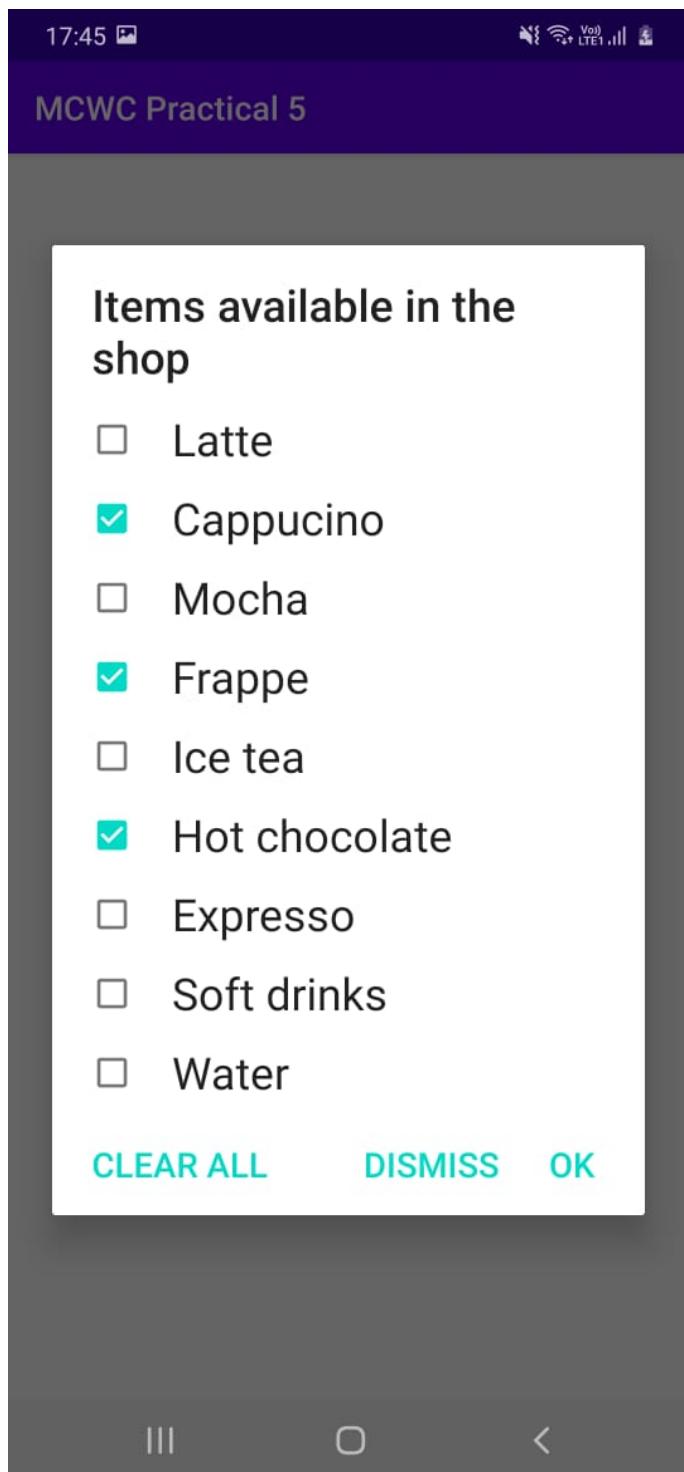
```
{  
    checkeditems[j]=false;  
    useritems.clear();  
    tv.setText("");  
}  
  
}  
});  
AlertDialog dialog=adb.create();  
dialog.show();  
  
}  
});  
}  
}  
}
```

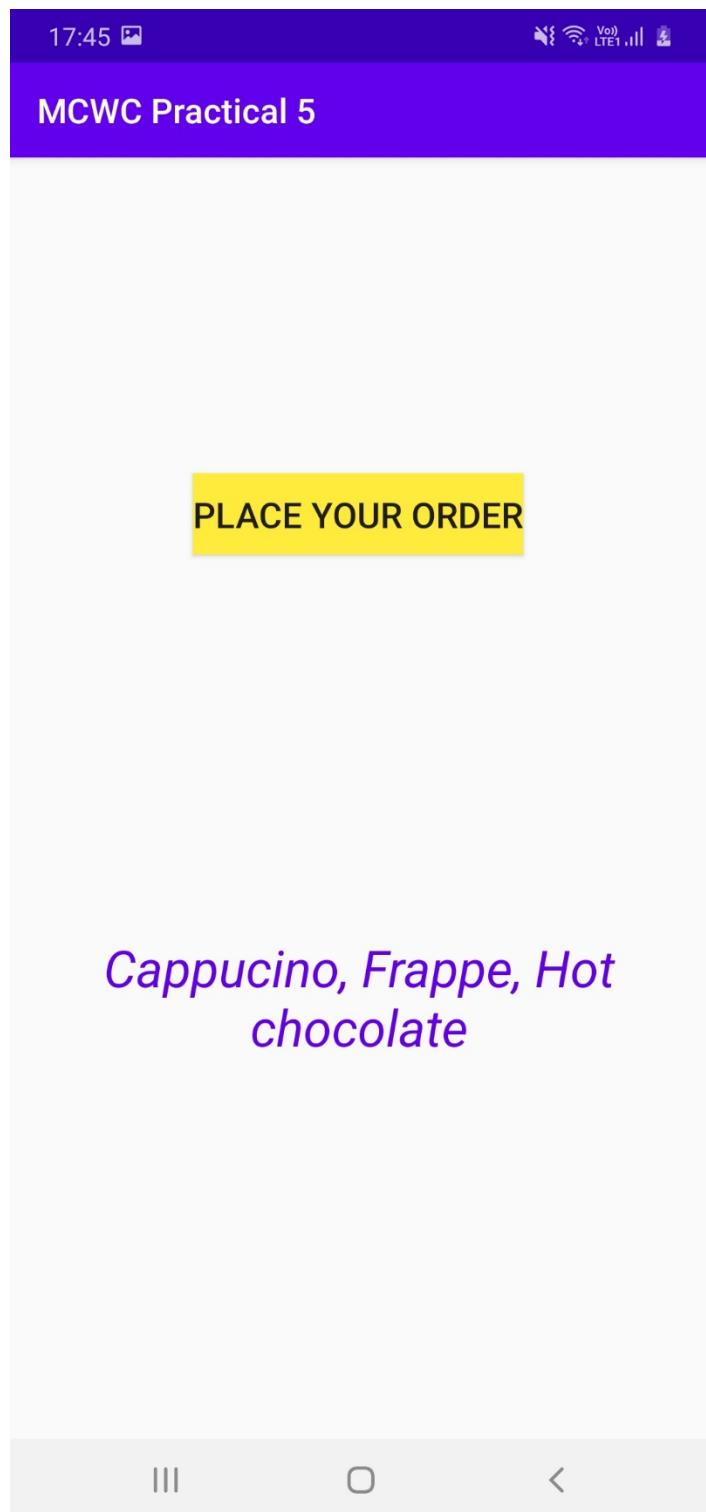
strings.xml

```
<?xml version="1.0"?>  
<resources>  
    <string name="app_name">MCWC Practical 5</string>  
    <string name="order">Place your Order</string>  
    <string-array name="menuitems">  
        <item>Latte</item>  
        <item>Cappuccino</item>  
        <item>Mocha</item>  
        <item>Frappe</item>  
        <item>Ice tea</item>  
        <item>Hot chocolate</item>  
        <item>Expresso</item>  
        <item>Soft drinks</item>  
        <item>Water</item>  
    </string-array>  
</resources>
```

Output:







Practical 6: Create an application in android for slideshow animation.

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">

    <ImageView
        android:id="@+id/iv_background"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:scaleType="centerCrop"
        android:src="@drawable/anim_slideshoww"
        tools:ignore="ContentDescription" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:shadowColor="#000000"
        android:shadowRadius="5"
        android:text="@string/slideshow"
        android:textColor="#ffffff"
        android:textSize="40sp"
        android:textStyle="bold"
        />

</RelativeLayout>
```

animm_slideshow.xml

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

    <item
        android:duration="4000"
        android:drawable="@drawable/image1"
        tools:ignore="StateListReachable" />

    <item
        android:duration="4000"
        android:drawable="@drawable/image2"
        tools:ignore="StateListReachable" />

    <item
        android:duration="4000"
        android:drawable="@drawable/image3" />
</animation-list>
```

MainActivity.java

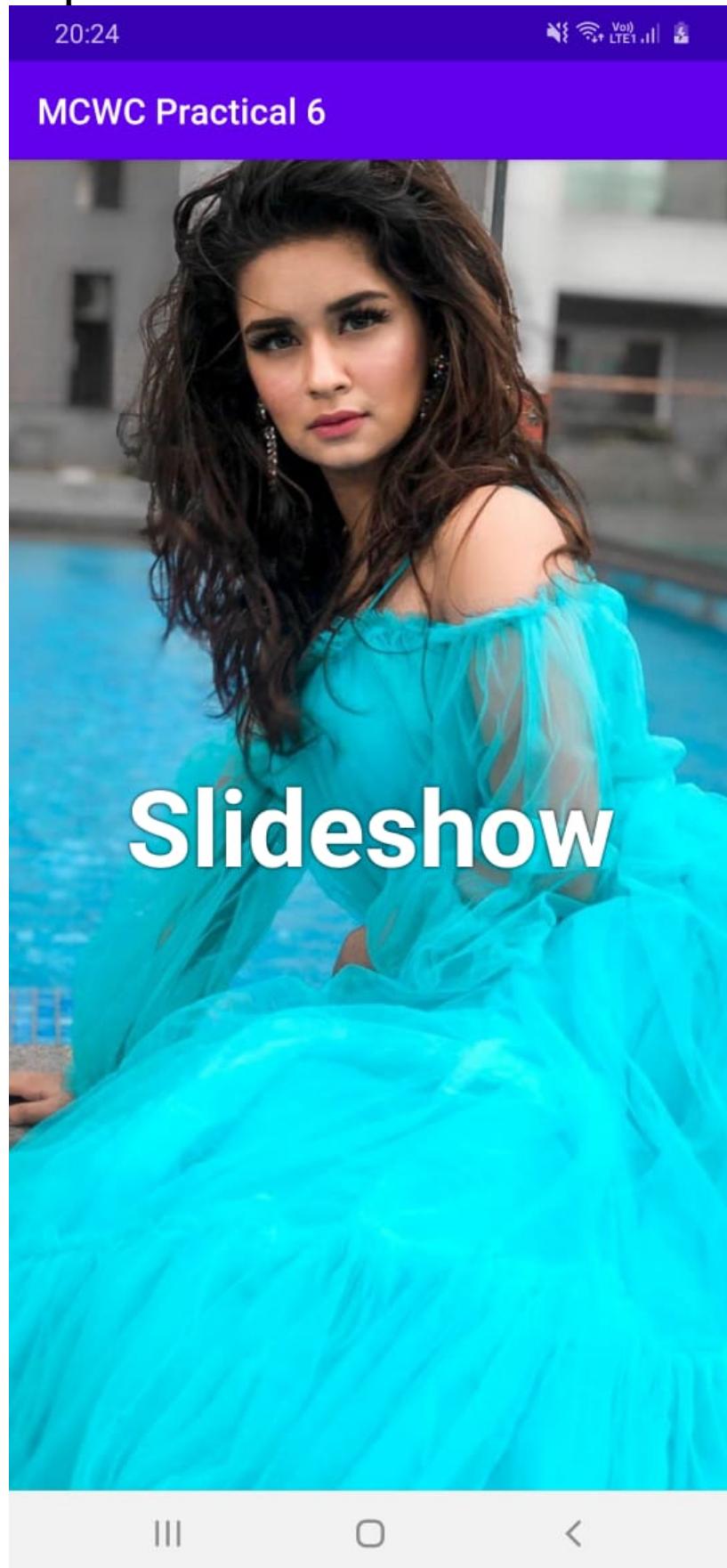
```
package com.example.mcwcpractical6;
import androidx.appcompat.app.AppCompatActivity;
import android.graphics.drawable.AnimationDrawable;
import android.os.Bundle;
import android.widget.ImageView;

public class MainActivity extends AppCompatActivity {

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

        ImageView iv_background = findViewById(R.id.iv_background);
        AnimationDrawable animationDrawable = (AnimationDrawable)
        iv_background.getDrawable();
        animationDrawable.start();
    }
}
```

Output:



MCWC Practical 6

Slideshow





Practical 7: Using Android, Create a login Activity. It asks “username” and “password” from user. If username and password are valid, it displays Welcome message using new activity.

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:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/login_text"
        android:id="@+id/textView_login"
        android:layout_alignParentTop="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/username_text"
        android:id="@+id/textView_username"
        android:layout_marginTop="66dp"
        android:layout_below="@+id/textView_login"
        android:layout_alignRight="@+id/textView_login"
        android:layout_alignEnd="@+id/textView_login" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/password_text"
        android:id="@+id/textView_password"
        android:layout_below="@+id/editText_user"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />

    <EditText
        android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
    android:inputType="textPersonName"
    android:ems="10"
    android:id="@+id/editText_user"
    android:layout_alignTop="@+id/textView_username"
    android:layout_alignParentRight="true"
    android:layout_alignParentEnd="true" />

<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:inputType="textPassword"
    android:ems="10"
    android:id="@+id/editText_password"
    android:layout_below="@+id/editText_user"
    android:layout_alignLeft="@+id/editText_user"
    android:layout_alignStart="@+id/editText_user" />

<Button
    android:id="@+id/button_login"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/textView_password"
    android:layout_alignLeft="@+id/textView_password"
    android:layout_below="@+id/editText_password"
    android:layout_marginStart="17dp"
    android:layout_marginLeft="17dp"
    android:layout_marginTop="60dp"
    android:text="@string/button_login" />
</RelativeLayout>
```

activity_user.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=".User"
    android:id="@+id/user_layout">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
    android:textAppearance="?android:attr/textAppearanceLarge"
    android:text="@string/Secon_page_text"
    android:id="@+id/textView"
    android:layout_alignParentTop="true"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="137dp" />
</RelativeLayout>
```

MainActivity.java

```
package com.example.simpleloginapp;

import android.annotation.SuppressLint;
import android.content.Intent;

import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import com.example.simpleloginapp.R;

public class MainActivity extends AppCompatActivity
{
    @SuppressLint("StaticFieldLeak")
    private static EditText username;
    @SuppressLint("StaticFieldLeak")
    private static EditText password;
    @SuppressLint("StaticFieldLeak")
    private static Button login_btn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        LoginButton();
    }

    @SuppressLint("SetTextI18n")
```

```
public void LoginButton() {
    username = (EditText) findViewById(R.id.editText_user);
    password = (EditText) findViewById(R.id.editText_password);
    login_btn = (Button) findViewById(R.id.button_login);

    login_btn.setOnClickListener(
        new View.OnClickListener() {
            @SuppressLint("SetTextI18n")
            @Override
            public void onClick(View v) {
                if(username.getText().toString().equals("user") &&
                   password.getText().toString().equals("pass") ) {
                    Toast.makeText(MainActivity.this,"User and Password is
correct",
                        Toast.LENGTH_SHORT).show();
                    Intent intent = new Intent(".User");
                    startActivity(intent);
                } else {
                    Toast.makeText(MainActivity.this,"User and Password is not
correct",
                        Toast.LENGTH_SHORT).show();
                }
            }
        );
    }

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

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        int id = item.getItemId();
        if (id == R.id.action_settings) {
            return true;
        }

        return super.onOptionsItemSelected(item);
    }
}
```

User.java

```
package com.example.simpleloginapp;

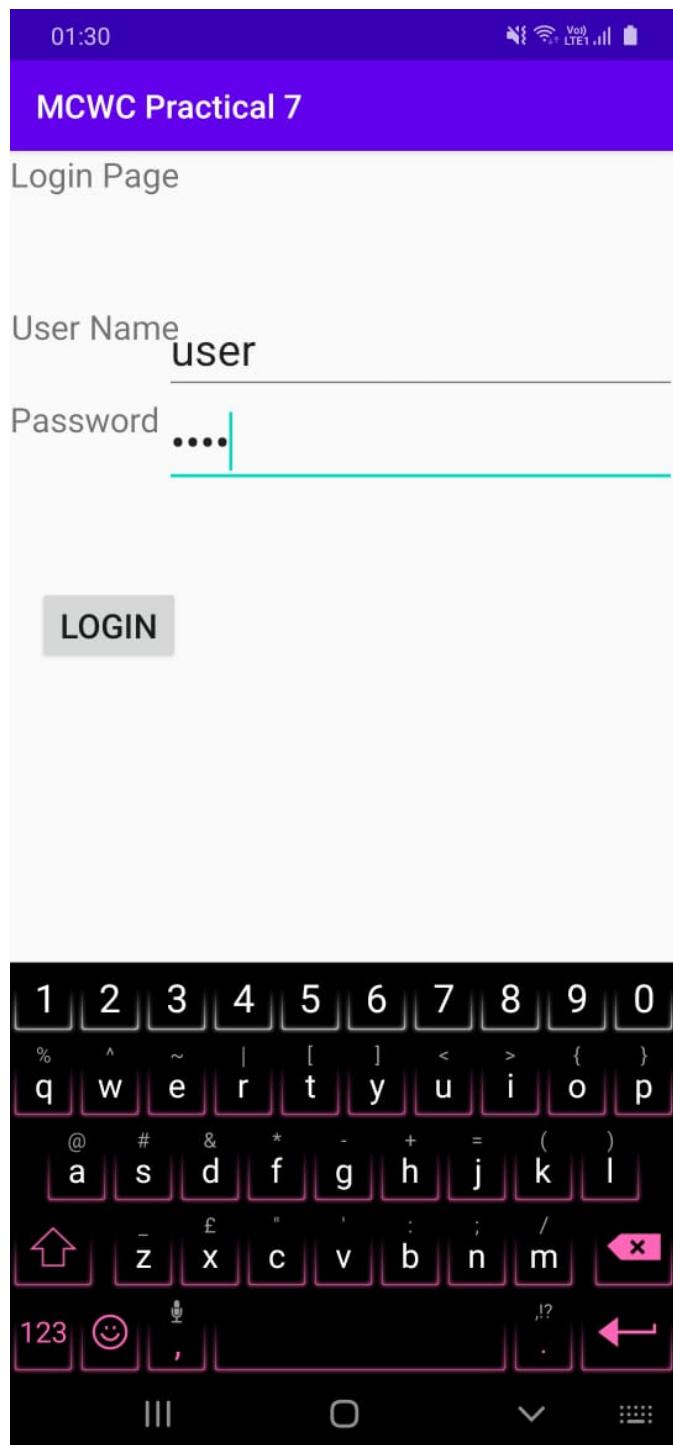
import androidx.appcompat.app.AppCompatActivity;

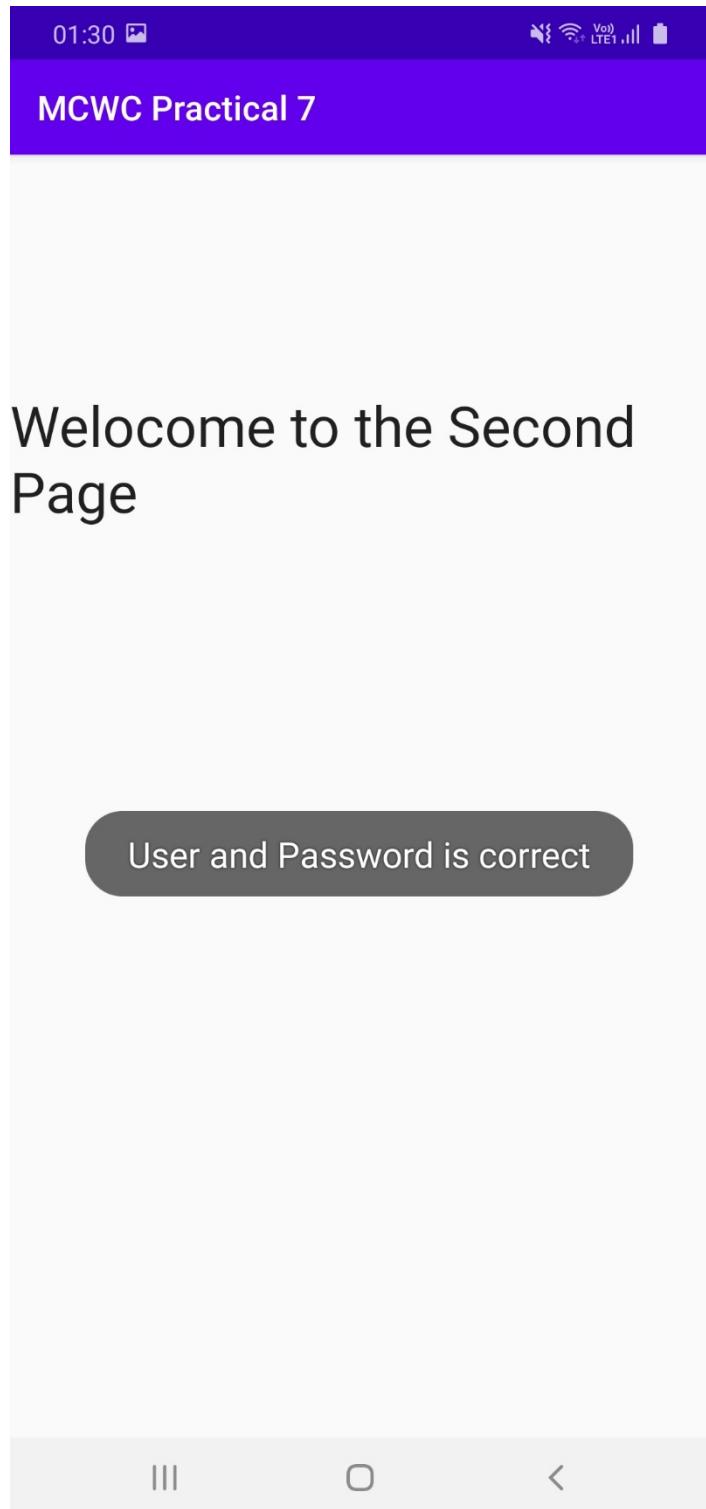
import android.os.Bundle;

public class User extends AppCompatActivity {

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

Output:





Practical 8: Create an app which list names of all leading daily newspapers (English, Hindi, Gujarati). When user selects one of them then it should show the newspaper via URL in Browser or WebView.

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.widget.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="com.example.mcwcpractical8.MainActivity">

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginLeft="20dp"
        android:layout_marginStart="20dp"
        android:layout_marginTop="18dp"
        android:text="@string/newspapers"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="25dp"
        android:text="@string/english"
        android:textSize="24sp"
        android:textStyle="bold"
        android:layout_below="@+id/textView3"
        android:layout_alignLeft="@+id/textView3"
        android:layout_alignStart="@+id/textView3" />

    <TextView
```

```
    android:id="@+id/textView5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="16dp"
    android:text="@string/e1"
    android:layout_below="@+id/textView4"
    android:layout_alignLeft="@+id/textView4"
    android:layout_alignStart="@+id/textView4" />
```

```
<TextView
    android:id="@+id/textView6"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="12dp"
    android:text="@string/e2"
    android:layout_below="@+id/textView5"
    android:layout_alignLeft="@+id/textView5"
    android:layout_alignStart="@+id/textView5" />
```

```
<TextView
    android:id="@+id/textView7"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView6"
    android:layout_alignStart="@+id/textView6"
    android:layout_below="@+id/textView6"
    android:layout_marginTop="37dp"
    android:text="@string/hindi"
    android:textSize="24sp"
    android:textStyle="bold" />
```

```
<TextView
    android:id="@+id/textView8"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView7"
    android:layout_alignStart="@+id/textView7"
    android:layout_below="@+id/textView7"
    android:layout_marginTop="14dp"
    android:text="@string/e3" />
```

```
<TextView
    android:id="@+id/textView9"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView8"
    android:layout_alignStart="@+id/textView8"
    android:layout_below="@+id/textView8"
    android:layout_marginTop="17dp"
    android:text="@string/e4" />
```

```
<TextView
    android:id="@+id/textView10"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView9"
    android:layout_alignStart="@+id/textView9"
    android:layout_below="@+id/textView9"
    android:layout_marginTop="53dp"
    android:text="@string/gujarati"
    android:textSize="24sp"
    android:textStyle="bold" />
```

```
<TextView
    android:id="@+id/textView11"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView10"
    android:layout_alignStart="@+id/textView10"
    android:layout_below="@+id/textView10"
    android:layout_marginTop="9dp"
    android:text="@string/e5" />
```

```
<TextView
    android:id="@+id/textView12"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView11"
    android:layout_alignStart="@+id/textView11"
    android:layout_below="@+id/textView11"
    android:layout_marginTop="19dp"
    android:text="@string/e6"/>
```

```
</android.widget.RelativeLayout>
```

MainActivity.java

```
package com.example.mcwcpractical8;

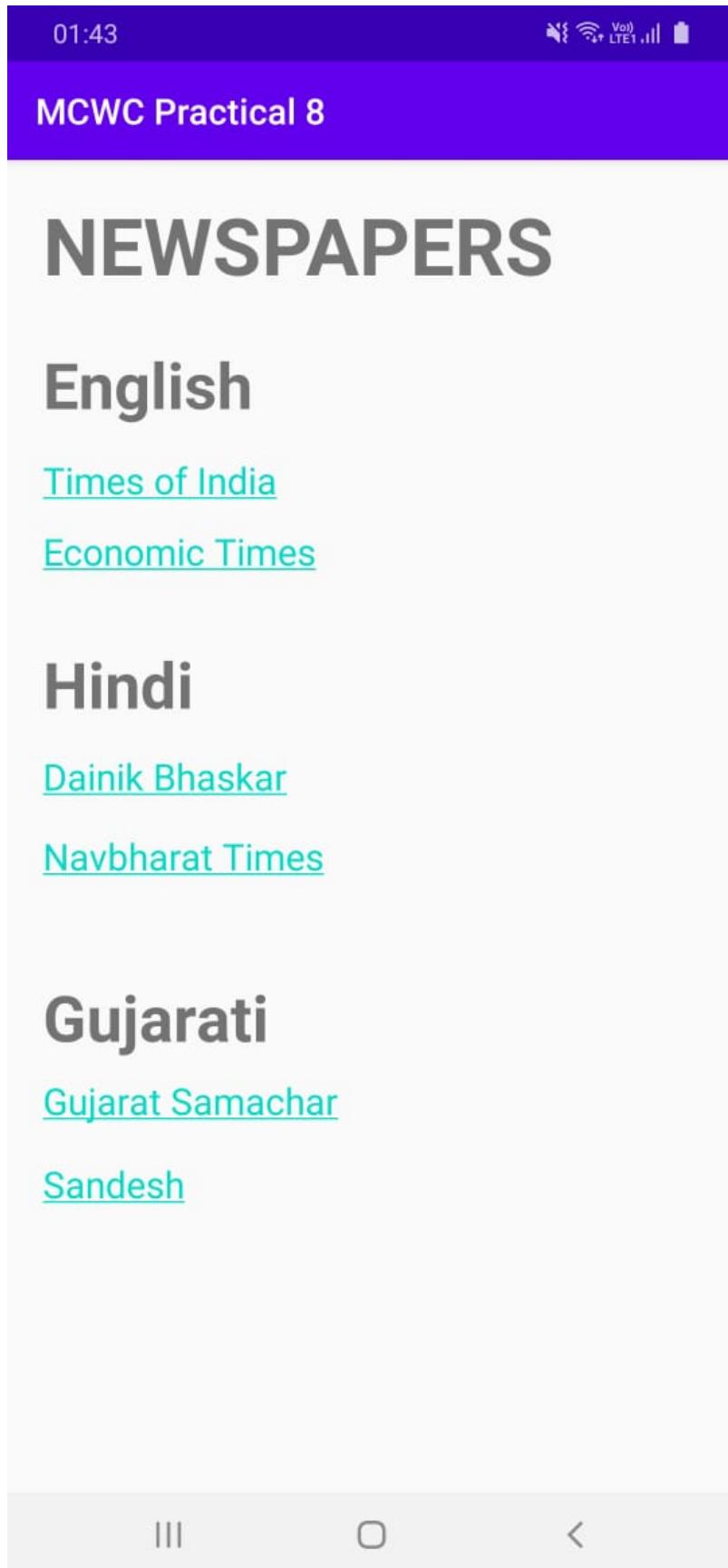
import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.text.method.LinkMovementMethod;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        TextView t1 = (TextView) findViewById(R.id.textView5);
        t1.setMovementMethod(LinkMovementMethod.getInstance());
        TextView t2 = (TextView) findViewById(R.id.textView6);
        t2.setMovementMethod(LinkMovementMethod.getInstance());
        TextView t3 = (TextView) findViewById(R.id.textView8);
        t3.setMovementMethod(LinkMovementMethod.getInstance());
        TextView t4 = (TextView) findViewById(R.id.textView9);
        t4.setMovementMethod(LinkMovementMethod.getInstance());
        TextView t5 = (TextView) findViewById(R.id.textView11);
        t5.setMovementMethod(LinkMovementMethod.getInstance());
        TextView t6 = (TextView) findViewById(R.id.textView12);
        t6.setMovementMethod(LinkMovementMethod.getInstance());
    }
}
```

Output:



01:44

● LIVE VIDEO What's making Neha Kakkar go #FullOn binge?

COVID-19 TOP DEALS

TOP NEWS BRIEFS TOI+ VIDEOS IPL 2020

LAC stand-off: India scrambles to buy high-altitude warfare kits from US

Jet-II becomes a possibility as creditors clear revival plan after months of talks

Peace along LAC 'deeply disturbed', impacting India-China ties: Jaishankar

Virus is genetically stable, no major mutation in it, says PMO

TOP VIDEOS SEE ALL

||| O <

01:44 🔍 🔳 VoLTE 4G

શરૂ કરો રજીસ્ટ્રેશન

ગુજરાત સમાચાર

કોરોના સામેના જંગમાં હવે પછીના અઢી મહિના
બહુ જ મહત્વનાઃ D.O. ઉર્ધ્વર્ધન



DC vs CSK Highlights: શિખર ધવન
સદીની મદદથી દિલ્હી કેપિટિલ્સે ચેન્નાઈ
સુપર કિંગ્સને હરાવ્યું



આગામી સપ્તાહે ભારત અને ચીનનાં કોર
કમાન્ડરોની યોજાણો 8મી બેઠક



પરમાણુ હथિયારો ન વધારવાનો રશિયાનો
પ્રસ્તાવ અમેરિકાઓએ હુકરાવ્યો



દેશમાં 3 કોરોના વેક્સિન ઝડપથી
માં

PORTRAITS
OF POWER

III O <

Practical 9: Create an Android App which has an activity to get details of a person like Name, BirthDate, Age, EmailAddress, PhoneNumber, Country, State, City, Gender, Hobbies, married:(ToggleButton) Etc..

Form should be followed by a Button with label “Submit”. On pressing send button second activity is launched which shows details entered in first activity. Second Activity also has a button “is Voter?” which checks weather the person is old enough to be a voter or not. Display result in Toast.

Utilize suitable UI controls (i.e. widgets). [When user enters country in AutoCompleteTextView, list of states should be displayed in Spinner automatically.]

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">
    <EditText
        android:id="@+id/etname"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="Name"
        android:gravity="center"/>
    <EditText
        android:id="@+id/etdate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Date"
        android:gravity="center"
        android:inputType="date"
        android:layout_below="@+id/etname"
        android:layout_alignParentEnd="true"
        android:layout_alignParentStart="true" />
    <EditText
        android:id="@+id/etage"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="number"
    android:layout_below="@+id/etdate"
    android:hint="Age"
    android:gravity="center"
    android:layout_alignParentEnd="true"
    android:layout_alignParentStart="true" />
<EditText
    android:id="@+id/etmail"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:hint="E-Mail"
    android:gravity="center"
    android:inputType="textEmailAddress"
    android:layout_below="@+id/etage"
    android:layout_alignParentStart="true"
    android:layout_alignParentEnd="true" />
<EditText
    android:id="@+id/etphone"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/etmail"
    android:ems="10"
    android:hint="Phone"
    android:gravity="center"
    android:inputType="phone"
    android:layout_alignParentStart="true"
    android:layout_alignParentEnd="true" />
<AutoCompleteTextView
    android:id="@+id/actvcountry"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/etphone"
    android:hint="Country"
    android:gravity="center"
    android:layout_alignParentStart="true"
    android:layout_alignParentEnd="true" />
<Spinner
    android:id="@+id/sp"
    android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/actvcountry" />
<RadioGroup
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="34dp"
    android:layout_below="@+id/sp"
    android:layout_alignParentStart="true"
    android:id="@+id/radioGroup">
    <RadioButton
        android:id="@+id/radioButton7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_below="@+id/sp"
        android:text="Male" />
    <RadioButton
        android:id="@+id/radioButton8"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="false"
        android:text="Female" />
</RadioGroup>
<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/sp"
    android:layout_marginTop="13dp"
    android:text="Gender : " />
<TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/radioGroup"
    android:layout_marginTop="19dp"
    android:text="Hobbies : "
    android:textSize="18sp"/>
<CheckBox
    android:id="@+id/cb1"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBottom="@+id/textView3"
    android:layout_toEndOf="@+id/textView3"
    android:text="Music" />
<CheckBox
    android:id="@+id/cb2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/cb1"
    android:layout_toEndOf="@+id/cb1"
    android:text="Dance" />
<CheckBox
    android:id="@+id/checkBox3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/cb2"
    android:layout_toEndOf="@+id/cb2"
    android:text="Play" />
<Switch
    android:id="@+id/switch1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/cb2"
    android:text="Married : "
    android:textSize="18dp"
    />
<Button
    android:id="@+id	btn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Submit"
    android:layout_below="@+id/switch1"
    android:layout_toEndOf="@+id/cb1" />
</RelativeLayout>
```

Activity_main2.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=".Main2Activity">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginTop="25dp"
        android:text="Name : "
        android:id="@+id/textView8" />
    <TextView
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignTop="@+id/textView8"
        android:layout_toEndOf="@+id/textView8"
        android:text=" " />
    <TextView
        android:id="@+id/textView10"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_below="@+id/textView8"
        android:layout_marginTop="12dp"
        android:text="Age : " />
    <TextView
        android:id="@+id/age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignTop="@+id/textView10"
        android:layout_toEndOf="@+id/textView8"
        android:text=" " />
    <TextView
        android:id="@+id/textView12"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
    android:layout_alignParentStart="true"
    android:layout_below="@+id/textView10"
    android:layout_marginTop="19dp"
    android:text="Phone : " />
<TextView
    android:id="@+id/phone"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/textView12"
    android:layout_toEndOf="@+id/textView12"
    android:text=" " />
<TextView
    android:id="@+id/textView14"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/textView12"
    android:layout_marginTop="15dp"
    android:text="Gender : " />
<TextView
    android:id="@+id/gender"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/textView14"
    android:layout_marginStart="10dp"
    android:layout_toEndOf="@+id/textView14"
    android:text=" " />
<TextView
    android:id="@+id/textView16"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/textView14"
    android:layout_marginTop="18dp"
    android:text="Country : " />
<TextView
    android:id="@+id/country"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/gender"
    android:layout_alignTop="@+id/textView16"
    android:text=" " />
```

```
<TextView
    android:id="@+id/textView18"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/textView16"
    android:layout_marginTop="14dp"
    android:text="State : " />
<TextView
    android:id="@+id/state"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBottom="@+id/textView18"
    android:layout_toEndOf="@+id/textView14"
    android:text=" " />
<TextView
    android:id="@+id/textView20"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/textView18"
    android:layout_marginTop="19dp"
    android:text="Hobby : " />
<TextView
    android:id="@+id/hobby"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/textView20"
    android:layout_toEndOf="@+id/textView16"
    android:text=" " />
<TextView
    android:id="@+id/textView22"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_alignParentStart="true"
    android:layout_marginBottom="218dp"
    android:text="Married : " />
<TextView
    android:id="@+id/married"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignStart="@+id/country"
```

```
    android:layout_alignTop="@+id/textView22"
    android:text=" " />
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_centerHorizontal="true"
    android:layout_marginBottom="92dp"
    android:text="Is Voter?" />
</RelativeLayout>
```

MainActivity.java

```
package com.example.admin.pr4;
import android.app.Activity;
import android.content.Intent;
import android.database.DataSetObserver;
import android.support.v7.app.AppCompatActivity; import android.os.Bundle;
import android.view.View; import android.view.ViewGroup; import
android.widget.Adapter; import android.widget.AdapterView; import
android.widget.ArrayAdapter;
import android.widget.AutoCompleteTextView; import android.widget.Button;
import android.widget.CheckBox; import android.widget.EditText; import
android.widget.RadioButton; import android.widget.RadioGroup; import
android.widget.Spinner; import android.widget.Switch;

public class MainActivity extends Activity {
    EditText etname,etage,etdate,etemail,etphone; AutoCompleteTextView
    actvcountry; Spinner s;
    RadioGroup rg;
    RadioButton rb;
    CheckBox cm,cd,cp;
    String state;
    Switch sw;
    Button btn;
    ArrayAdapter ad,sp;
    String cntry[]={"India","Canada"};
    String India[]={"Gujarat","Rajasthan","Goa"}; @Override

    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState); setContentView(R.layout.activity_main);
        etname=(EditText)findViewById(R.id.etname);
```

```
etage=(EditText)findViewById(R.id.etage);
etdate=(EditText)findViewById(R.id.etdate);
etemail=(EditText)findViewById(R.id.etmail);
etphone=(EditText)findViewById(R.id.etphone);

actvcountry=(AutoCompleteTextView)findViewById(R.id.actvcountry);
s=(Spinner)findViewById(R.id.sp);
rg=(RadioGroup)findViewById(R.id.radioGroup);
cm=(CheckBox)findViewById(R.id.cb1);

cd=(CheckBox)findViewById(R.id.cb2);
cp=(CheckBox)findViewById(R.id.checkBox3);
sw=(Switch)findViewById(R.id.switch1);
btn=(Button)findViewById(R.id.btn);
ad=new
ArrayAdapter(getApplicationContext(),R.layout.support_simple_spinner_dropdown_item,cntry);
actvcountry.setAdapter(ad);
actvcountry.setThreshold(1);
sp=new
ArrayAdapter(getApplicationContext(),R.layout.support_simple_spinner_dropdown_item,India);
s.setAdapter(sp);
s.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener()
{
    @Override
    public void onItemSelected(AdapterView<?> parent, View view, int
position, long id) {
        state=s.getSelectedItem().toString();
    }
    @Override
    public void onNothingSelected(AdapterView<?>
parent) { }
}
btn.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
    Intent ii=new
        Intent(MainActivity.this,Main2Activity.class); String hobby="";
    ii.putExtra("name",etname.getText().toString());
    ii.putExtra("age",etage.getText().toString());
    ii.putExtra("state",state);
    ii.putExtra("date",etdate.getText().toString());
    ii.putExtra("email",etemail.getText().toString());
    ii.putExtra("phone",etphone.getText().toString());
    ii.putExtra("country",actvcountry.getText().toString());
}
})
```

```
rb=(RadioButton)findViewById(rg.getCheckedRadioButtonId());
ii.putExtra("gender",rb.getText().toString()); if(cm.isChecked())
{
    hobby=hobby+cm.getText().toString();
}
if(cd.isChecked())
{
    hobby=hobby+cd.getText().toString();
}
if(cp.isChecked())
{
    hobby=hobby+cp.getText().toString();
}
ii.putExtra("hobby",hobby);
if(sw.isChecked())
{
    ii.putExtra("married","Yes");
}
else
{
    ii.putExtra("married","No");
}
startActivity(ii);
});  }
}
```

Output:

SCREEN 1 :

Name

Date

Age

E-Mail

Phone

Country

Gender :

Male

Female

Hobbies : Music Dance Play

Married :

SUBMIT

Hima

26/06/1998

20

hima@gmail.com

9988776655

India

Gender :

Male

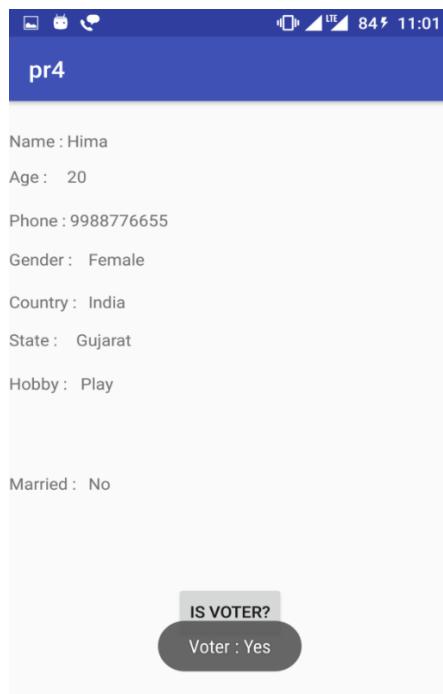
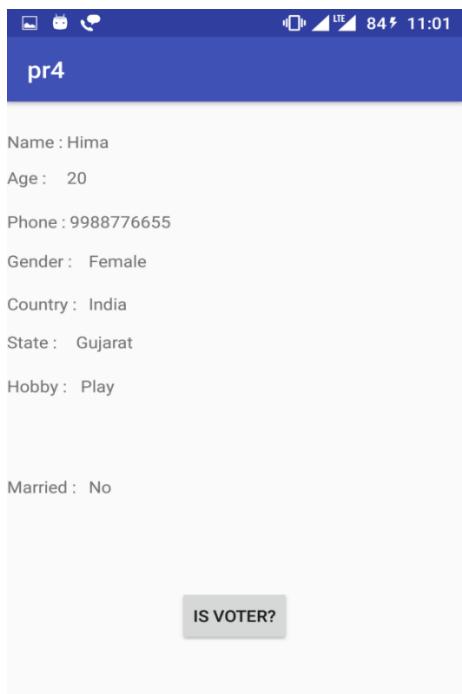
Female

Hobbies : Music Dance Play

Married :

SUBMIT

SCREEN 2 :



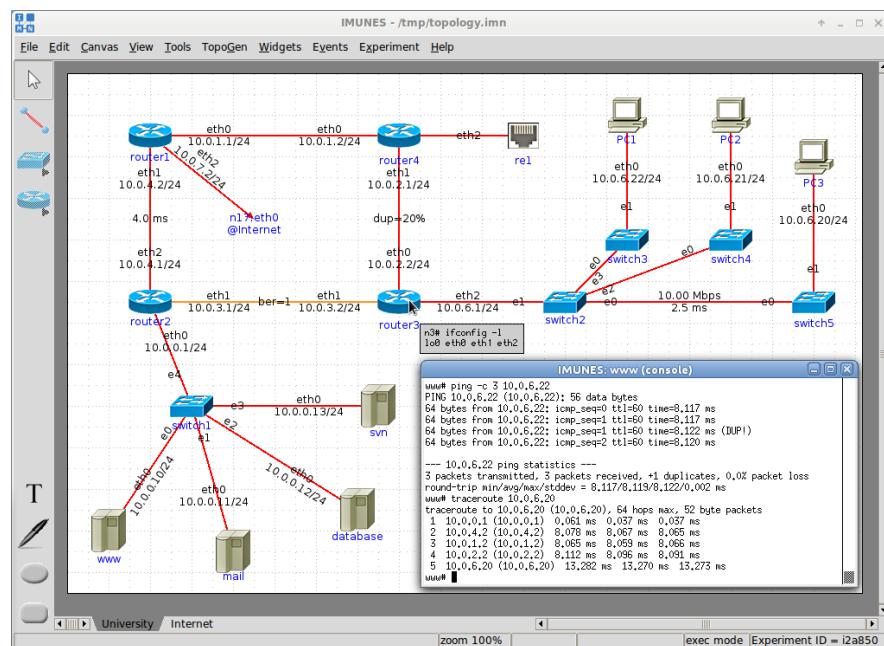
Practical 10: Study of Network Simulator tools for wireless network simulation

A **network simulator** is software that predicts the behavior of a computer network. Since communication Networks have become too complex for traditional analytical methods to provide an accurate understanding of system behavior, network simulators are used.

In simulators, the computer network is modeled with devices, links, applications etc. and the performance is analysed. Simulators come with support for the most popular technologies and networks in use today such as Wireless LANs, Mobile Adhoc Networks, Wireless Sensor Networks, Vehicular Adhoc Networks, Cognitive Radio networks, LTE / LTE- Advanced Networks, Internet of things (IOT) etc.

Most of the commercial simulators are GUI driven, while some network simulators are CLI driven. The network model / configuration describes the network (nodes, routers, switches, links) and the events (data transmissions, packet error etc.).

Below given image shows the screenshot for the simulation tool IMUNES – IP network simulator/emulator.



Most network simulators use discrete event simulation, in which a list of pending "events" is stored, and those events are processed in order, with some events triggering future events—such as the event of the arrival of a packet at one node triggering the event of the arrival of that packet at a downstream node.

Network Simulation Tools

ns-2 Network Simulator

ns-2 is a discrete event simulator targeted at networking research.

ns-2 provides substantial support for simulation of TCP, routing, and multicast protocols over wired and wireless (local and satellite) networks.

OMNeT++

OMNeT++ is an open-source, component-based simulation package built on C++ foundations. It offers a C++ simulation class library and GUI support (graphical network editing, animation).

SSFNet

SSF (Scalable Simulation Framework) is a standard for discrete-event simulation in Java and C++. Several SSF implementations and a large number of open-source protocol models and other components exist.

Akaroa

Akaroa is a package for supporting the Multiple Replications In Parallel (MRIP) simulation technique to harness the computing power of a network of inexpensive workstations. • Integration exists with the ns-2 and OMNeT++ simulators.

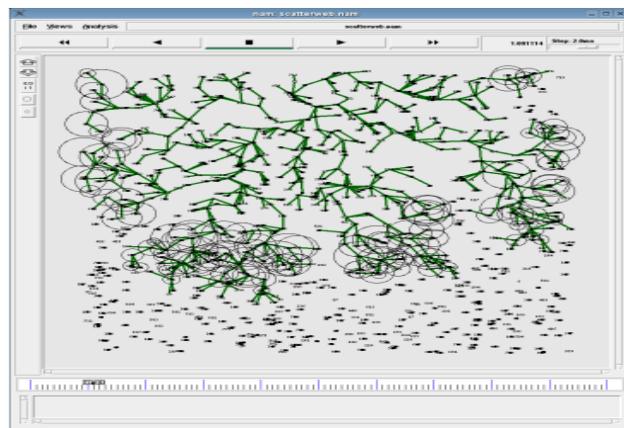
The Network Simulator, ns-2

What is NS2

NS2 stands for Network Simulator Version 2. It is an open-source event-driven simulator designed specifically for research in computer communication networks.

Features of NS2

1. It is a discrete event simulator for networking research.
2. It provides substantial support to simulate bunch of protocols like TCP, FTP, UDP, HTTP and DSR.
3. It simulates wired and wireless network
4. It is primarily Unix based.
5. Uses TCL as its scripting language.
6. Discrete event scheduler



ns-2: Components

ns: the simulator itself

nam: the Network Animator

 Visualize ns (or other) output

 GUI input simple ns scenarios

Pre-processing:

 Traffic and topology generator

Post-processing:

 Simple trace analysis, often in Awk, Perl, Python, or Tcl

ns-2: Models

Traffic models and applications

Web, FTP, Telnet, Constant-bit Rate (CBR), Real Audio

Transport protocols

 Unicast: TCP (Reno, Vegas, etc.), UDP

 Multicast: SRM (Scalable Reliable Multicast)

Routing and queueing

 Wired routing, Ad-hoc routing and Directed Diffusion

 Queueing protocols: RED, drop-tail, etc.

Physical media

 Wired (point-to-point, LANs),

 Wireless (multiple propagation models), Satellite communication

End-to-End Argument: File Transfer

Even if network guaranteed reliable delivery

 Need to provide end-to-end checks

 e.g., network card may malfunction

If network is highly unreliable

 Adding some level of reliability helps performance, not correctness

Uses of network simulators / emulators

Network simulators provide a cost-effective method for

- a. [Network design](#) validation for enterprises / data centres /sensor networks etc.
- b. Analysing Utilities distribution communication, railway signalling / communication etc.
- c. Network R & D (More than 70 % of all Network Research paper reference a network simulator)
- d. Défense applications such as HF / UHF / VHF MANET networks, Tactical data links etc
- e. Education - Lab experimentation. Most universities use a network simulation to teach / experiment on networking since its too expensive to buy hardware equipment covering all the various technologies.

There are a wide variety of network simulators, ranging from the very simple to the very complex. Minimally, a network simulator must enable a user to

1. Model the [network topology](#) specifying the nodes on the network and the links between those nodes
2. Model the application flow (traffic) between the nodes
3. Providing network performance metrics as output
4. Visualization of the packet flow
5. Technology / protocol evaluation and device designs
6. Logging of packet / events for drill down analyses / debugging