|| Jai Sri Gurudev ||

Sri Adichunchanagiri Shikshana Trust (R)

S J C Institute of Technology

Chickballapur - 562101

Affiliated to VTU, Belagavi & Approved by AICTE, New Delhi,
NAAC & NBA [CSE, ECE & ME] Accredited, Gold Rated QS-I Gauge

We'll Train You Well

Department of Information Science and Engineering

Mobile Application Development Laboratory Manual

6th Semester

18CSMP68

Name: _____

USN: _____

Vision of the Department

Educating Students to Engineer Information Science and Technology for Advancing the Knowledge as to best serve the Real world.

Mission of the Department

M1: Focusing on Fundamentals and Applied aspects in both Information Science Theory and Programming practices.

M2: Training comprehensively and encouraging R&D culture in trending areas of Information Technology.

M3: Collaborating with premier Institutes and Industries to nurture Innovation and learning, in cutting edge Information Technology.

M4: Preparing the students who are much Sought-after, Productive and Well-respected for their work culture having Lifelong Learning practice.

M5: Promoting ethical and moral values among the students so as to enable them emerge as responsible professionals.

Program Outcomes

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO12: Life Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Program Educational Objectives

PEO1: Engage in Successful professional career in Information Science and Technology.

PEO2: Pursue higher studies and research to advance the knowledge for Solving Contemporary Problems in IT industry.

PEO3: Adapt to a constantly changing world through Professional Development and Sustained Learning.

PEO4: Exhibit professionalism and team work with social concern.

PEO5: Develop Leadership and Entrepreneurship Skills by incorporating Organizational goals.

Program Specific Outcomes

PSO1: Apply the knowledge of data structures, database systems, system programming, networking, web development and AI & ML techniques in engineering the software.

PSO2: Exhibit solid foundations and advancements in developing software / hardware systems for solving contemporary problems.

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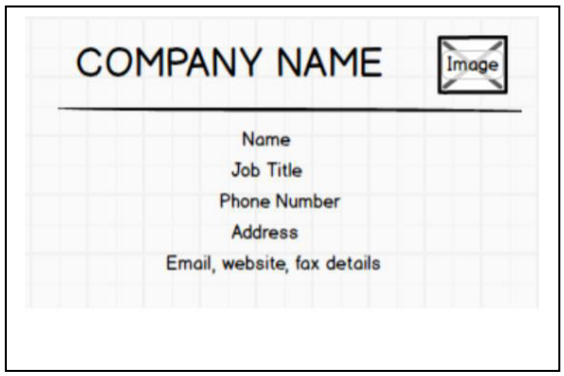
Program-1

Create an application to design a Visiting Card. The Visiting card should have a company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the center. Information like the name of the employee, job title, phone number, address, email, fax and the website address is to be displayed. Insert a horizontal line between the job title and the phone number.



XML-CODE

```
<?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">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="17dp"
        android:layout_marginLeft="17dp"
        android:layout_marginTop="17dp"
        android:layout_marginEnd="244dp"
        android:layout_marginRight="244dp"
        android:layout_marginBottom="486dp"
        android:text="SJCIT"
        android:textSize="38dp" />


    <ImageView
        android:id="@+id/imageView"
        android:layout_width="231dp"
        android:layout_height="174dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
```

```
        android:layout_marginEnd="-14dp"
        android:layout_marginRight="-14dp"
        android:layout_marginBottom="481dp"
        app:srcCompat="@drawable/logo" />

    <View
        android:id="@+id/view"
        android:layout_width="wrap_content"
        android:layout_height="4dp"
        android:layout_alignParentBottom="true"
        android:background="#4444"
        android:layout_marginBottom="466dp" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="117dp"
        android:layout_marginRight="117dp"
        android:layout_marginBottom="394dp"
        android:text="Amar Akbar Anthony"
        android:textSize="30dp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="64dp"
        android:layout_marginRight="64dp"
        android:layout_marginBottom="343dp"
        android:text="Assistant Professor-ISE"
        android:textSize="25dp" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="127dp"
        android:layout_marginRight="127dp"
        android:layout_marginBottom="294dp"
```

```
        android:text="Ph No: 9988776655"
        android:textSize="20dp" />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="10dp"
        android:layout_marginRight="10dp"
        android:layout_marginBottom="229dp"
        android:text="PB No. 20, BB Road, Chickballapur-562 101"
        android:textSize="20dp" />

    <TextView
        android:id="@+id/textView6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="44dp"
        android:layout_marginRight="44dp"
        android:layout_marginBottom="189dp"
        android:text="Email: amarakbaranthony@sjcit.ac.in"
        android:textSize="20dp" />
</RelativeLayout>
```

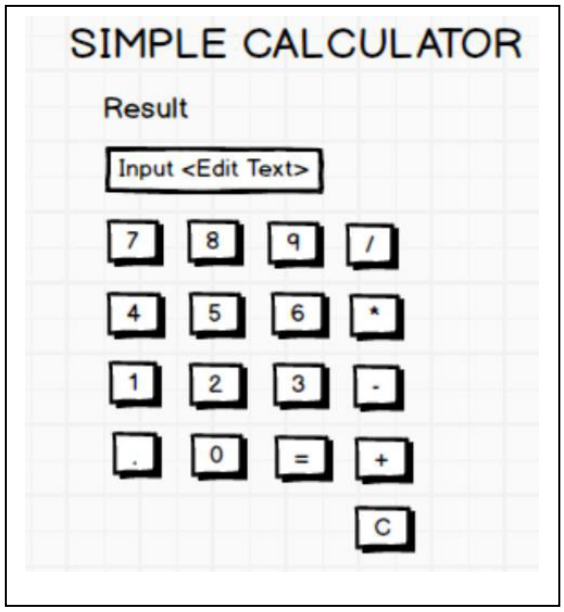
JAVA-CODE

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class MainActivity extends AppCompatActivity {
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

OUTPUT:

Program-2

Develop an Android application using controls like Button, TextView, EditText for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.



XML-CODE

```
<?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">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="98dp"
        android:layout_marginBottom="653dp"
        android:text="SIMPLE CALCI"
        android:textSize="38dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.042" />
    <EditText
        android:id="@+id/editText1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="115dp"
        android:layout_marginBottom="547dp"
        android:ems="10"
        android:hint="Enter the First Number"
        android:inputType="textPersonName"
        android:text="" />

    <EditText
        android:id="@+id/editText2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="111dp"
        android:layout_marginBottom="455dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="Enter the Second Number"
        android:text="" />

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="203dp"
        android:layout_marginBottom="350dp"
        android:text="0"
        android:textSize="40dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="274dp"
        android:layout_marginBottom="237dp"
        android:onClick="doAdd"
        android:text="ADD" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
```

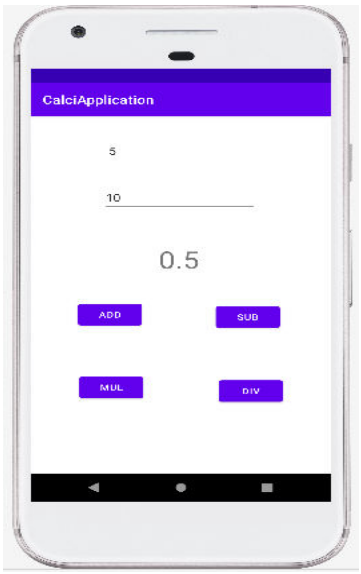
```
        android:layout_marginEnd="68dp"
        android:layout_marginBottom="233dp"
        android:onClick="doSub"
        android:text="SUB" />

    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="277dp"
        android:layout_marginBottom="115dp"
        android:onClick="doMul"
        android:text="MUL" />

    <Button
        android:id="@+id/button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="63dp"
        android:layout_marginBottom="104dp"
        android:onClick="doDiv"
        android:text="DIV" />

</RelativeLayout>
```

JAVA-CODE

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    EditText e1,e2;
    TextView tv1;
    @Override
protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = (EditText)findViewById(R.id.editText1);
        e2 = (EditText)findViewById(R.id.editText2);
        tv1 = (TextView)findViewById(R.id.textView1);
    }
```

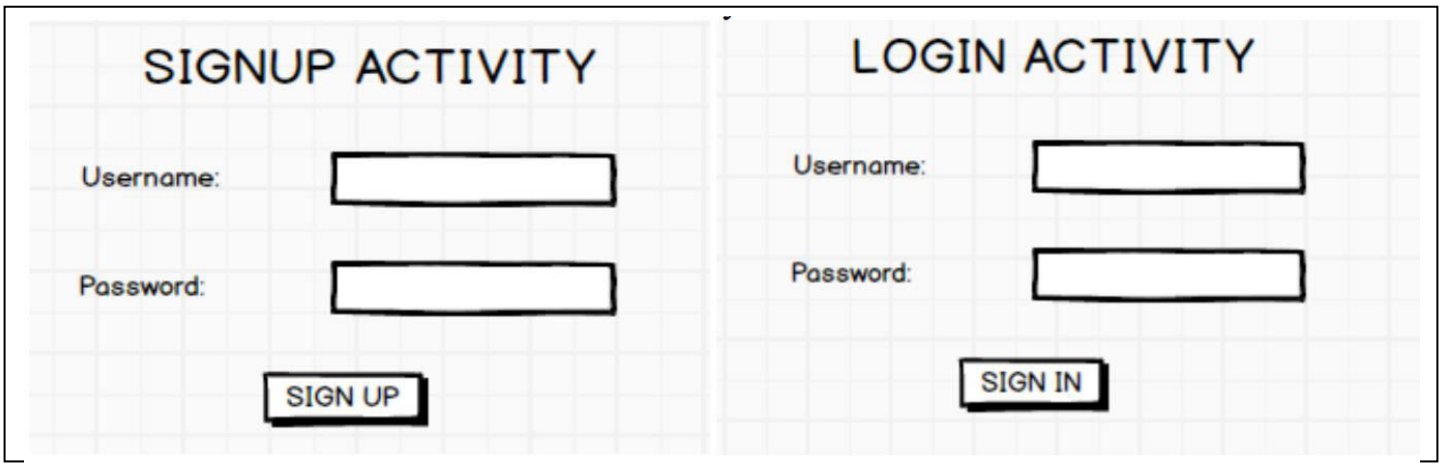
```
public void doAdd(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result= a1+a2;
        tv1.setText(""+result);
    }

public void doSub(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result= a1-a2;
        tv1.setText(""+result);
    }

public void doMul(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result= a1*a2;
        tv1.setText(""+result);
    }

public void doDiv(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        float result= a1/a2;
        tv1.setText(""+result);
    }
}
```

OUTPUT:



Program-3

Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:
- Password should contain uppercase and lowercase letters.
- Password should contain letters and numbers.
- Password should contain special characters.
- Minimum length of the password (the default value is 8).
On successful SIGN UP proceed to the next Login activity. Here the user should SIGN IN using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying "Successful Login" or else display a toast message saying "Login Failed". The user is given only two attempts and after that display a toast message saying "Failed Login Attempts" and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.



//SignUpActivity.java

```
import.AppCompatActivity;
import.Intent;
import.Bundle;
import.View;
import.Button;
import.EditText;
import.Toast;
import.Pattern;
public class SignUpActivity extends AppCompatActivity {
EditText emailEditText, passwordEditText;
Button signUpBtn;
@Override
protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_signup);
        emailEditText = findViewById(R.id.emailEditText);
        passwordEditText = findViewById(R.id.passwordEditText);
        signUpBtn = findViewById(R.id.signUpBtn);
        signUpBtn.setOnClickListener(new View.OnClickListener() {
                @Override
        public void onClick(View v) {
                String email = emailEditText.getText().toString();
                String password = passwordEditText.getText().toString();
                if (!isValidPassword(password)) {
```

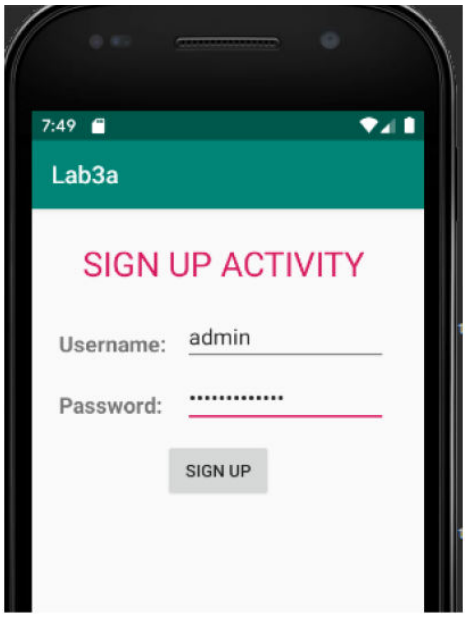
```
                        Toast.makeText(SignUpActivity.this, "Password doesn't match rules",
                        Toast.LENGTH_SHORT).show();
                        return;
        }
        Intent intent = new Intent(SignUpActivity.this, LoginActivity.class);
        intent.putExtra("email", email);
        intent.putExtra("password", password);
        startActivity(intent);
        }
    });
}

Pattern lowerCase = Pattern.compile("^.*[a-z].*$");
Pattern upperCase = Pattern.compile("^.*[A-Z].*$");
Pattern number = Pattern.compile("^.*[0-9].*$");
Pattern specialCharacter = Pattern.compile("^.*[^a-zA-Z0-9].*$");
private Boolean isValidPassword(String password) {
// Checks if password length is less than 8
if (password.length() < 8) {
        return false;
}
// Returns false if password doesn't contain a lower case character
if (!lowerCase.matcher(password).matches()) {
        return false;
}
// Returns false if password doesn't contain an upper case character
if (!upperCase.matcher(password).matches()) {
        return false;
}
// Returns false if password doesn't contain a number
if (!number.matcher(password).matches()) {
        return false;
}
// Returns false if password doesn't contain a special character
if (!specialCharacter.matcher(password).matches()) {
        return false;
}
return true;
}
}
```

//LoginActivity.java

```
import.AppCompatActivity;
import.Intent;
import.Bundle;
import.View;
import.Button;
import.EditText;
import.Toast;
public class LoginActivity extends AppCompatActivity {
        EditText emailEditText, passwordEditText;
        Button loginBtn;
        @Override
        protected void onCreate(Bundle savedInstanceState) {
```

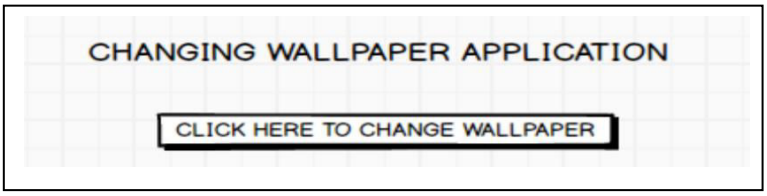
```
                super.onCreate(savedInstanceState);
                setContentView(R.layout.activity_login);
                emailEditText = findViewById(R.id.emailEditText);
                passwordEditText = findViewById(R.id.passwordEditText);
                loginBtn = findViewById(R.id.loginBtn);
                String registeredEmail = getIntent().getStringExtra("email");
                String registeredPassword = getIntent().getStringExtra("password");
                loginBtn.setOnClickListener(new View.OnClickListener() {
                        @Override
                        public void onClick(View v) {
                                String email = emailEditText.getText().toString();
                                String password = passwordEditText.getText().toString();
                                if(registeredEmail.equals(email)&&
                                        registeredPassword.equals(password))
                                {
                                Intent intent = new Intent(LoginActivity.this, LoginSuccessActivity.class);
                                startActivity(intent);
                                }
                                else
                                {
                                        Toast.makeText(LoginActivity.this, "Invalid Credentials", Toast.LE
                                        NGTH_SHORT).show();
                                }
                        }
                });
        }
}

                                        //LoginSuccessActivity.java
import .AppCompatActivity;
import .Bundle;
public class LoginSuccessActivity extends AppCompatActivity {
        @Override
        protected void onCreate(Bundle savedInstanceState) {
                super.onCreate(savedInstanceState);
                setContentView(R.layout.activity_login_success);
        }
}
```

OUTPUT:



Program-4

Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.

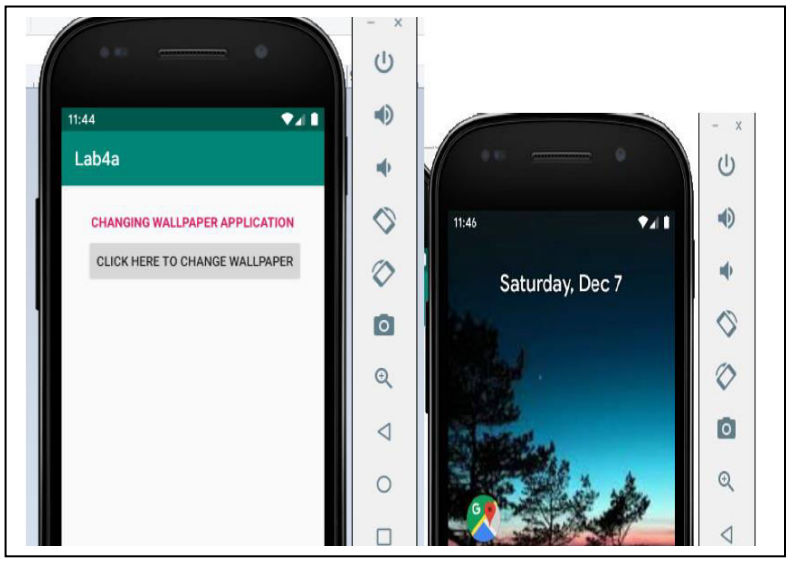


//First, create the android application as discussed in "Create your First Android Application". Copy the //images and save the images in the drawable folder. Following is the content of the modified //res/layout/activity_main.xml.
//Save five images (jpg format) in the drawable folder. In this example one.jpg, two.jpg,three.jpg, four.jpg and //five.jpg images are saved in drawable folder.
//MainActivity.java package com.example.lab4a;

```
import androidx.appcompat.app.AppCompatActivity;
import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.drawable.AnimationDrawable;
import android.graphics.drawable.BitmapDrawable;
import android.graphics.drawable.Drawable;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import java.io.IOException;
import java.util.Timer;
import java.util.TimerTask;
public class MainActivity extends AppCompatActivity {
Button changewallpaper;
Timer mytimer;
Drawable drawable;
WallpaperManager wpm;
int prev=1;
@Override
protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mytimer = new Timer();
        wpm = WallpaperManager.getInstance(this);
        changewallpaper = findViewById(R.id.button); changewallpaper.setOnClickListener(new
                View.OnClickListener() {
                @Override public void onClick(View view) {
                setWallpaper();
                }
        });
}

private void setWallpaper() {
        mytimer.schedule(new TimerTask() {
        @Override
```

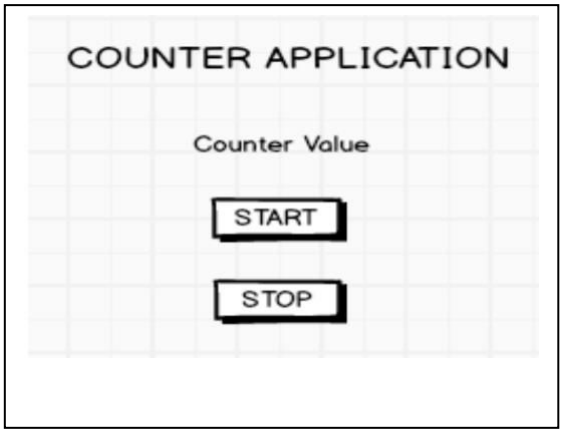
```
        public void run() {
                if(prev==1) {
                        drawable = getResources().getDrawable(R.drawable.one);
                        prev = 2;
                }
                else if(prev==2) {
                        drawable = getResources().getDrawable(R.drawable.two);
                        prev=3;
                }
                else if(prev==3) {
                        drawable = getResources().getDrawable(R.drawable.three);
                        prev=4;
                }
                else if(prev==4) {
                        drawable = getResources().getDrawable(R.drawable.four);
                        prev=5;
                }
                else if(prev==5) {
                        drawable = getResources().getDrawable(R.drawable.five);
                        prev=1;
                }

        Bitmap wallpaper = ((BitmapDrawable)drawable).getBitmap();
        try {
                wpm.setBitmap(wallpaper);
                } catch (IOException e) {
                        e.printStackTrace();
                }
        }
},0,30000); } }
```

OUTPUT:



Program - 5

Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextView control.

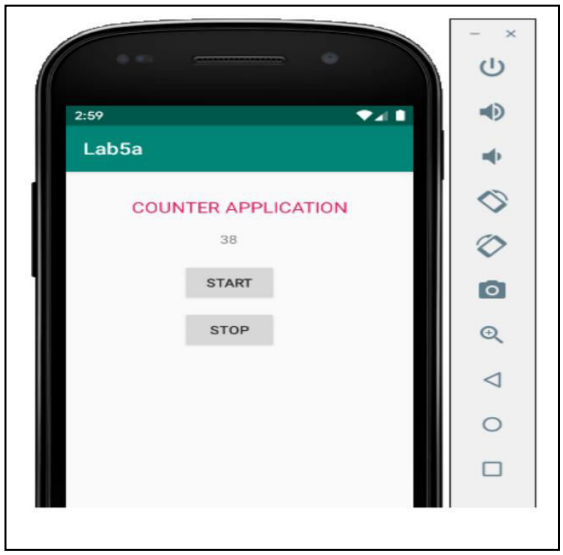


//MainActivity.java

```
package com.example.a5a;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
        Button btnstart, btnstop;
        TextView txtcounter;
        int i = 1;
        Handler customHandler = new Handler();
        @Override
        protected void onCreate(Bundle savedInstanceState) {
                super.onCreate(savedInstanceState);
                setContentView(R.layout.activity_main);
                txtcounter = findViewById(R.id.textView1);
                btnstart = findViewById(R.id.btn_start);
                btnstop = findViewById(R.id.btn_stop);
                btnstart.setOnClickListener(new View.OnClickListener() {
                @Override
                public void onClick(View view) {
                        customHandler.postDelayed(updateTimerThread,0);
                }
        });
btnstop.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
                customHandler.removeCallbacks(updateTimerThread);
        }
        });
}
```

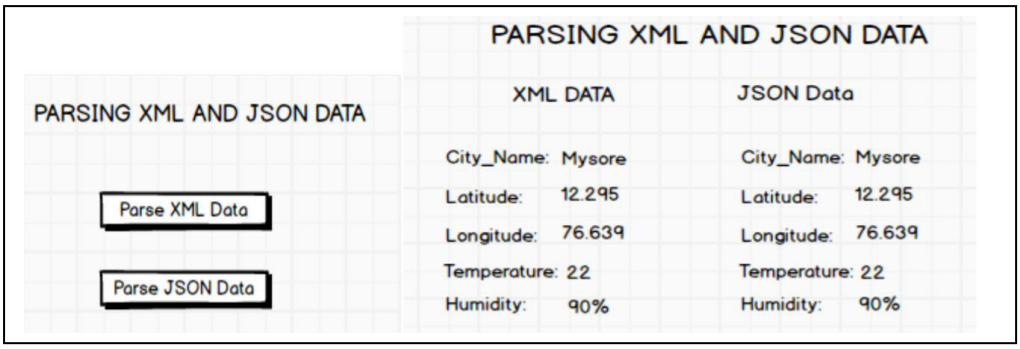
```
private final Runnable updateTimerThread = new Runnable() {
        @Override
        public void run() {
                txtcounter.setText(""+i);
                customHandler.postDelayed(this,1000);
                i++;
                }
        };
}
```

OUTPUT:



Program-6

Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.



//MainActivity.java

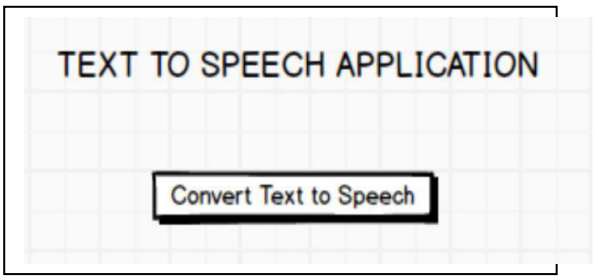
```
import android.os.Bundle;
import android.util.Log;
import android.util.Xml;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;
import org.xml.sax.SAXException;
import org.xmlpull.v1.XmlPullParser;
import org.xmlpull.v1.XmlPullParserException;
import java.io.IOException;
import java.io.InputStream;
import java.nio.charset.StandardCharsets;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.ParserConfigurationException;

public class MainActivity extends AppCompatActivity {
        Button parseXmlBtn, parseJsonBtn;
        TextView displayTextView;

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

```
        parseJsonBtn = findViewById(R.id.parseJsonBtn);
        parseXmlBtn = findViewById(R.id.parseXmlBtn);

        displayTextView = findViewById(R.id.displayTextView);

        parseXmlBtn.setOnClickListener(new View.OnClickListener() {
                @Override
                public void onClick(View v) {
                        try {
                                InputStream is = getAssets().open("city.xml");

           DocumentBuilderFactory documentBuilderFactory = DocumentBuilderFactory.newInstance();
           DocumentBuilder documentBuilder = documentBuilderFactory.newDocumentBuilder();
           Document document = documentBuilder.parse(is);

           StringBuilder stringBuilder = new StringBuilder();
           stringBuilder.append("XML Data");
           stringBuilder.append("\n----------");

           NodeList nodeList = document.getElementsByTagName("place");

           for (int i = 0; i < nodeList.getLength(); i++) {
                Node node = nodeList.item(i);
                if (node.getNodeType() == Node.ELEMENT_NODE) {
                        Element element = (Element) node;

                        stringBuilder.append("\nName: ").append(getValue("name", element));
                        stringBuilder.append("\nLatitude: ").append(getValue("lat", element));
                        stringBuilder.append("\nLongitude: ").append(getValue("long", element));
                        stringBuilder.append("\nTemperature: ").append(getValue("temperature", element));
                        stringBuilder.append("\nHumidity: ").append(getValue("humidity", element));
                        stringBuilder.append("\n----------");
                        }
                }
                displayTextView.setText(stringBuilder.toString());

         } catch (Exception e) {
           e.printStackTrace();
           Toast.makeText(MainActivity.this, "Error Parsing XML", Toast.LENGTH_SHORT).show();
         }
       }
     });

parseJsonBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
                String json;
                StringBuilder stringBuilder = new StringBuilder();
                try {
                        InputStream is = getAssets().open("city.json");
                        int size = is.available();
                        byte[] buffer = new byte[size];
                        is.read(buffer);
```

```
                        json = new String(buffer, StandardCharsets.UTF_8);
                        JSONArray jsonArray = new JSONArray(json);
                        stringBuilder.append("JSON Data");
                        stringBuilder.append("\n----------");
                         for (int i = 0; i < jsonArray.length(); i++) {
                                JSONObject jsonObject = jsonArray.getJSONObject(i);
                                stringBuilder.append("\nName: ").append(jsonObject.getString("name"));
                                stringBuilder.append("\nLatitude: ").append(jsonObject.getString("lat"));
                                stringBuilder.append("\nLongitude: ").append(jsonObject.getString("long"));
                        stringBuilder.append("\nTemperature:").append(jsonObject.getString("temperature"));
                        stringBuilder.append("\nHumidity: ").append(jsonObject.getString("humidity"));
                        stringBuilder.append("\n----------");
                }
                displayTextView.setText(stringBuilder.toString());
                is.close();
        } catch (IOException | JSONException e) {
                e.printStackTrace();
                Toast.makeText(MainActivity.this, "Error in parsing JSON data from!",Toast.LENGTH_SHORT)
                        .show();
                }
        }
    });
  }

private String getValue(String tag, Element element) {
        return element.getElementsByTagName(tag).item(0).getChildNodes().item(0).getNodeValue();
        }
}
```

Program-7

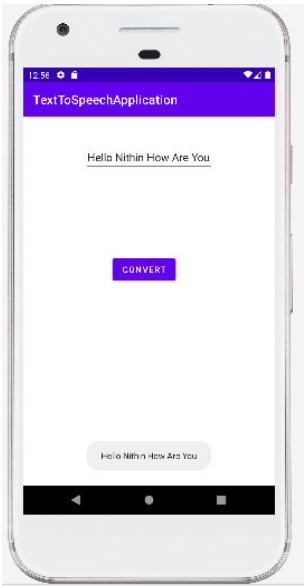
Develop a simple application with one EditText so that the user can write some text in it. Create a button called "Convert Text to Speech" that converts the user input text into voice.



//MainActivity.java

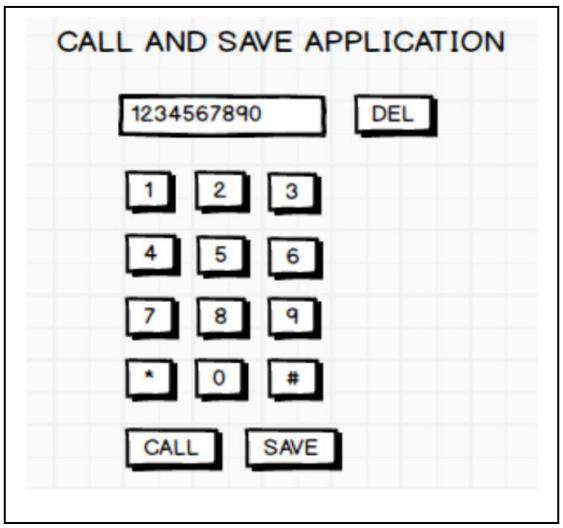
```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {

        TextToSpeech t1;
        EditText e1;
        @Override
        protected void onCreate(Bundle savedInstanceState) {
                super.onCreate(savedInstanceState);
                setContentView(R.layout.activity_main);
                e1 = (EditText)findViewById(R.id.editText);
                t1 = new TextToSpeech(getApplicationContext(), new TextToSpeech.OnInitListener() {
                @Override
                public void onInit(int status) {
                        if (status!=TextToSpeech.ERROR){
                                t1.setLanguage(Locale.UK);
                                }
                         }
                });
        }
        public void convert(View view){
                String tospeak = e1.getText().toString();
                Toast.makeText(getBaseContext(),tospeak,Toast.LENGTH_LONG).show();
                t1.speak(tospeak,TextToSpeech.QUEUE_FLUSH,null);
        }
}
```

OUTPUT:


12:56
TextToSpeechApplication
Hello Nithin How Are You
CONVERT
Hello Nithin How Are You

Program-8

Create an activity like a phone dialler with CALL and SAVE buttons. On pressing the CALL button, it must call the phone number and on pressing the SAVE button it must save the number to the phone contacts.



//MainActivity.java

```
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
        EditText phoneNumberEditText;
        Button clearBtn, callBtn, saveBtn;

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

                phoneNumberEditText = findViewById(R.id.phoneNumberEditText);

                clearBtn = findViewById(R.id.clearBtn);
                callBtn = findViewById(R.id.callBtn);
                saveBtn = findViewById(R.id.saveBtn);

                clearBtn.setOnClickListener(new View.OnClickListener() {
```

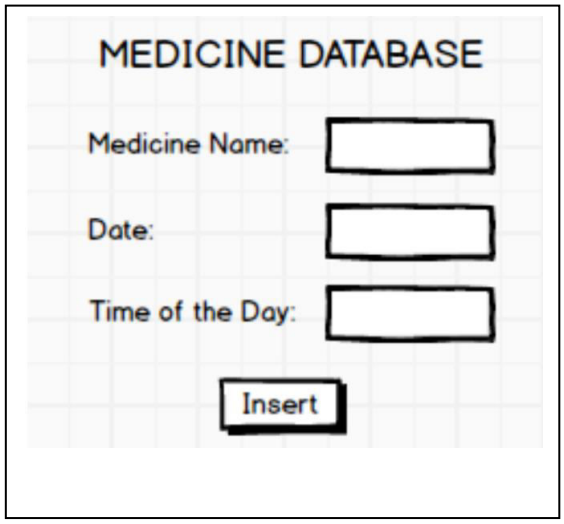
```
                @Override
                public void onClick(View v) {
                        phoneNumberEditText.setText("");
                 }
        });

    callBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String phoneNumber = phoneNumberEditText.getText().toString();
        Intent intent = new Intent(Intent.ACTION_DIAL);
        intent.setData(Uri.parse("tel:" + phoneNumber));
        startActivity(intent);
    }
  });

    saveBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String phoneNumber = phoneNumberEditText.getText().toString();
            Intent intent = new Intent(Intent.ACTION_INSERT);
            intent.setType(ContactsContract.Contacts.CONTENT_TYPE);
            intent.putExtra(ContactsContract.Intents.Insert.PHONE, phoneNumber);
            startActivity(intent);
        }
     });
  }

public void inputNumber(View v) {
    Button btn = (Button)v;
    String digit = btn.getText().toString();
    String phoneNumber = phoneNumberEditText.getText().toString();
    phoneNumberEditText.setText(phoneNumber + digit);
    }
}
```

PART-B:

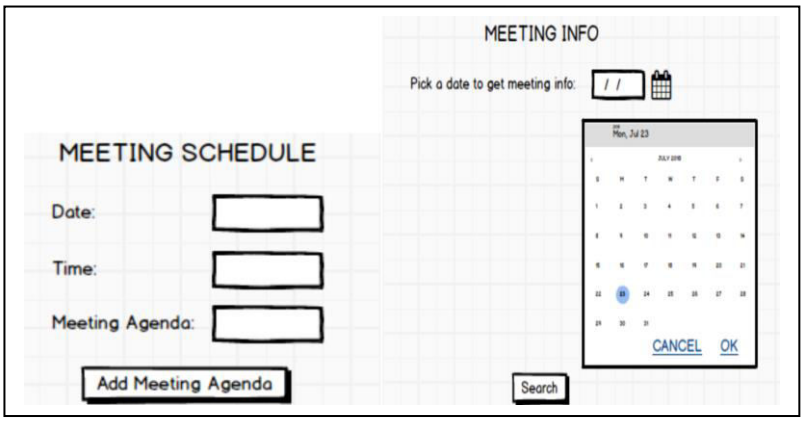
Part B programs should be developed as an application and are to be demonstrated as a mini project in a group by adding extra features or the students can also develop their application and demonstrate it as a mini-project.

(Projects/programs are not limited to the list given in Part B).

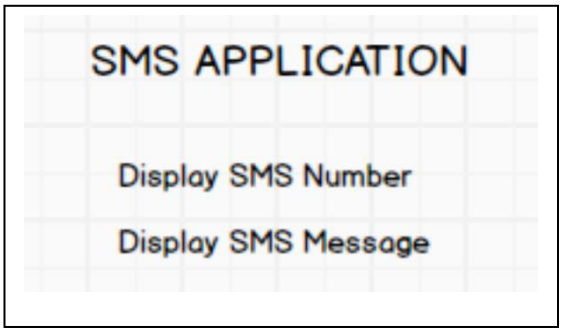
1. **Write a program to enter Medicine Name, Date and Time of the Day as input from the user and store it in the SQLite database. Input for Time of the Day should be either Morning or Afternoon or Eveningor Night. Trigger an alarm based on the Date and Time of the Day and display the Medicine Name.**



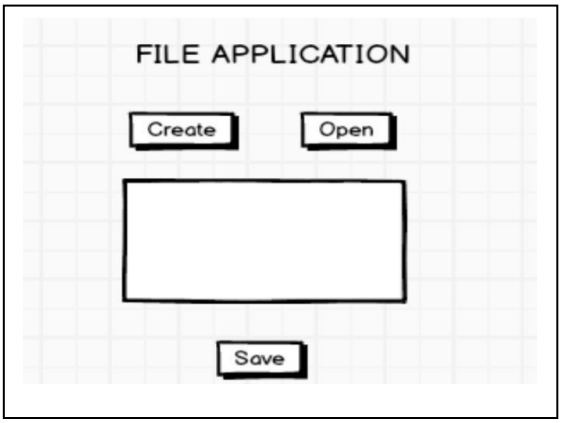
2. **Develop a content provider application with an activity called "Meeting Schedule" which takes Date, Time and Meeting Agenda as input from the user and store this information into the SQLite database. Create another application with an activity called "Meeting Info" having DatePicker control, which on the selection of a date should display the Meeting Agenda information for that particular date, else it should display a toast message saying "No Meeting on this Date".**



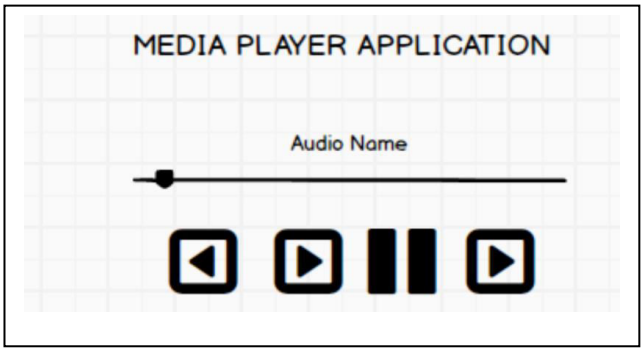
3. **Create an application to receive an incoming SMS which is notified to the user. On clicking this SMS notification, the message content and the number should be displayed on the screen. Use appropriate emulator control to send the SMS message to your application.**



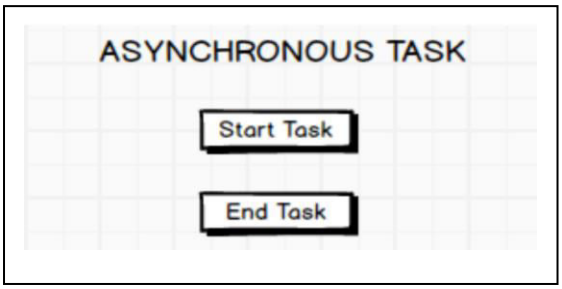
4. **Write a program to create an activity having a Text box, and also Save, Open and Create buttons. The user has to write some text in the Text box. On pressing the Create button the text should be saved as a text file in MkSDcard. On subsequent changes to the text, the Save button should be pressed to store the latest content to the same file. On pressing the Open button, it should display the contents from the previously stored files in the Text box. If the user tries to save the contents in the Textbox to a file without creating it, then a toast message has to be displayed saying "First Create a File".**



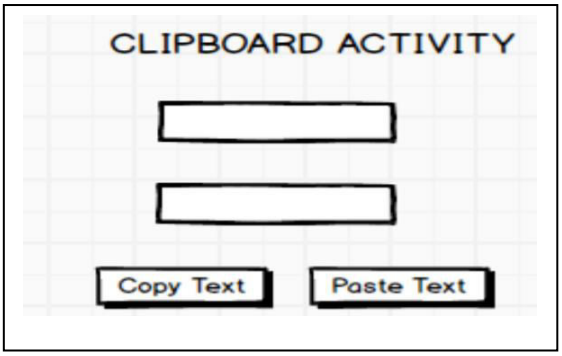
5. **Create an application to demonstrate a basic media playerthat allows the user to Forward, Backward, Play and Pause an audio. Also, make use of the indicator in the seek bar to move the audio forward or backward as required.**



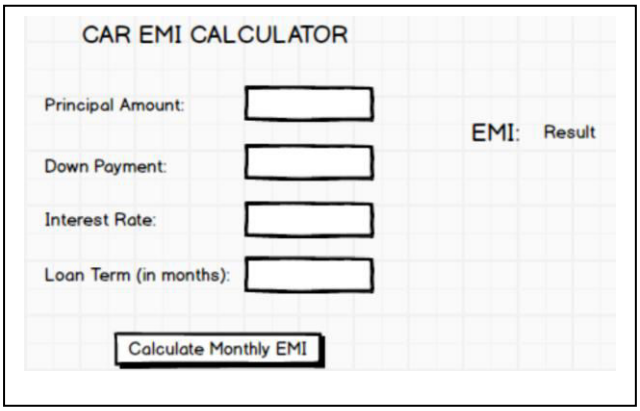
6. **Develop an application to demonstrate the use of Asynchronous tasks in android. The asynchronous task should implement the functionality of a simple moving banner. On pressing the Start Task button, the banner message should scrollfrom right to left. On pressing the Stop Task button, the banner message should stop.Let the banner message be "Demonstration of Asynchronous Task".**



7. **Develop an application that makes use of the clipboard framework for copying and pasting of the text. The activity consists of two EditText controls and two Buttons to trigger the copy and paste functionality.**



8. **Create an AIDL service that calculates Car Loan EMI. The formula to calculate EMI is E = P * (r(1+r)n)/((1+r)n -1) where E = The EMI payable on the car loan amount P = The Car loan Principal Amount r = The interest rate value computed on a monthly basis n = The loan tenure in the form of months The down payment amount has to be deducted from the principal amount paid towards buying the Car. Develop an application that makes use of this AIDL service to calculate the EMI. This application should have four EditText to read the PrincipalAmount, Down Payment, Interest Rate, Loan Term (in months) and a button named as "Calculate Monthly EMI". On click of this button, the result should be shown in a TextView. Also, calculate the EMI by varying the Loan Term and Interest Rate values.**



Viva Voce Questions

1) What is Android?
2) What Is the Google Android SDK?
3) What is the Android Architecture?
4) Describe the Android Framework.
5) What is AAPT?
6) What is the importance of having an emulator within the Android environment?
7) What is the use of an activityCreator?
8) Describe Activities.
9) What are Intents?
10) Differentiate Activities from Services.
11) What items are important in every Android project?
12) What is the importance of XML-based layouts?
13) What are containers?
14) What is Orientation?
15) What is the importance of Android in the mobile market?
16) What do you think are some disadvantages of Android?
17) What is adb?
18) What are the four essential states of an activity?
19) What is ANR?
20) Which elements can occur only once and must be present?
21) How are escape characters used as attribute?
22) What is the importance of settings permissions in app development?
23) What is the function of an intent filter?
24) Enumerate the three key loops when monitoring an activity
25) When is the onStop() method invoked?
26) Is there a case wherein other qualifiers in multiple resources take precedence over locale?
27) What are the different states wherein a process is based?
28) How can the ANR be prevented?
29) What role does Dalvik play in Android development?
30) What is the AndroidManifest.xml?
31) What is the proper way of setting up an Android-powered device for app development?
32) Enumerate the steps in creating a bounded service through AIDL.
33) What is the importance of Default Resources?
34) When dealing with multiple resources, which one takes precedence?
35) When does ANR occur?
36) What is AIDL?
37) What data types are supported by AIDL?
38) What is a Fragment?
39) What is a visible activity?
40) When is the best time to kill a foreground activity?
41) Is it possible to use or add a fragment without using a user interface?
42) How do you remove icons and widgets from the main screen of the Android device?
43) What are the core components under the Android application architecture?
44) What composes a typical Android application project?
45) What is a Sticky Intent?
46) Do all mobile phones support the latest Android operating system?
47) What is portable wi-fi hotspot?

48) What is an action?
49) What is the difference between a regular bitmap and a nine-patch image?
50) What language is supported by Android for application development?