

EN NO.: 1 Introduction : About Android Development.

13.7.24

Aim:

To create an android application which displays a word or any text message on the screen.

Procedure:

1. Download the android studio application from the official web side and install its new version and follow the instruction and complete the processes.

2. Click on, create a new project with any name.
3. And, select an "empty activity" template and select Java code.

4. Write a code in a file and adjust the template by our own.

5. And link the activity to your layout.
6. compile and after all the basic set up, run the code and emulator to display the output.

Theory:

Introduction : About Android.

Android open source Project so we can customize it as based on our requirement or customize the for telephonic connection.

Android has an integrated open - source webkit layout - Based web browser or support user

Interfaces like HTML5, and CSS3

It supports multi-tasking means we can run multiple applications at a time switch between them.

It provides support for virtual reality on 2D | 3D graphics.

Pre-requisites to learn Android.

Activities: The activity represents your app. The Activity make your app, which holds all the screen, buttons, switch and views are part of the activity. It is also called as "user interface".

Services: This part won't be seen directly by user and one of the background to perform long-running operation even if user are not active and application is destroyed. It interacts with a content provider.

Broadcast Receivers: Broadcast receiver help your app to communicate other app to android system. Using this your app can communicate other app and system events. It can help build fast and user-friendly app by communicating with the system.

Steps for converting a Java file into dexfile.

Step 1: We have some source code written in Java source file with Java extension.

Step 2: Then this Java will be compiled and convert into object code with file extension class.

Step 3: Then this class file will be translated into dms, jni
By the native virtual machine dms stands for native executable
DM is based on register since Java uses memory to run it
requires more memory and instructions run with its own byte
code and runs .jar file run uses Java byte code and uses
code and runs .dex file run uses Java byte code and uses

APK file extension:

It is an Installer package file which install on
Google's is called Android APK stand for Android Application
package. It can be also run on other OS like Mac.

META-INF directory

MANIFEST.MF : manifest file

CERT.RSA : the certificate of application

LIB : directory containing the compiled code that is
specific to a software layer of a program.

- MIPS: compiled code for MIPS Processor Only

RES: The directory containing resources not compiled
into resources. OTC.

res/values/strings.xml

Dex2dex: Dex2dex compiled Rn dex file format.
understand by DVM.

Resources: ARSC : file containing Pre compiled resources
Android API levels.

Android 13

Android 12

Android 12

Android 11

Android 10

Android 9

Android 8.1

Android 7.1

Android 7.0

Android 6.0

Android 5.1

Android 5.0

Android 4.4 W

Android 4.3

Android 4.2

Android 4.1

Android 3.2

Android 3.1

Android 2.3.3 (API level 10)

Android 2.3 (API level 9)

Android Java Basics:

Setup Android Studio

Create new project

Edit source code

Run application on emulator

Android manifest build. Gradle

Project folder structure

Manifest folder

Java folder

res (resources) folder

- 1. drawable folder
- 2. layout folder
- 3. mipmap folder
- 4. values folder

Gradle script.

Program :

MainActivity.java

```
package com.example.exp1;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity; import
com.example.exp1.R;
public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
}
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent" android:layout_height="match_parent"
    android:background="#FFFFFF4">

    <TextView android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello, praveen "
        android:textSize="35sp"
        android:textColor="#7E587E"
        android:layout_centerInParent="true"/>
</RelativeLayout>
```

Test

~~Result : Build 2~~
Result : Build 2
Create an android application which is
displayed hollow word on any text message on
screen has implemented successfully.

EX NO: 2 Application To change font and colour.

20.7.21

Aim:

To write an application which will change the font and colour of the text and display a fast message when the message is clicked.

Procedure:

1. open a new project by clicking empty view activity
2. In Main Activity Java import the necessary android width packages.
3. Create an object for text view by find view By ID.
 - a. Set the size, font, text by using functions set Text size(), set type face(), set text().
 - b. In the activity main - XML, use text view tag to set the layout of green, and in button tag, set the appearance for the button.
 - c. Run the application by clicking the run button.
 - d. Then, you can able to see no output function by emulation.

Program :

MainActivity.java

```
package com.example.myapplication;
import android.graphics.Typeface;
import android.os.Bundle;
import android.widget.Button;
import android.widget.TextView; import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        TextView textView = findViewById(R.id.textView);
        Button changeTextButton = findViewById(R.id.changeTextButton);
        changeTextButton.setOnClickListener(view -> {
            textView.setTextSize(32);
            textView.setTypeface(Typeface.SERIF,
                Typeface.ITALIC); textView.setText("welcome to android studio!");
            Toast.makeText(MainActivity.this, "!!Font and size Changed!!",
                Toast.LENGTH_SHORT).show();
        });
    }
}
```

Appcelerator

Welcome, happy to see you

click me

Welcome to android
studio!!

click me

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent" android:layout_height="match_parent"
    android:background="#FFF0DB">
    <TextView android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Welcome ,happy to see you!"
        android:textSize="24sp" android:textColor="#B5651D"
        android:layout_centerHorizontal="true"
        android:layout_centerVertical="true"/>
    <Button android:id="@+id/changeTextButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="click"
        android:textColor="#FFF9E3"
        android:layout_below="@+id/textView"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="20dp"/>
</RelativeLayout>
```

~~Path~~
~~Project~~.
~~src~~.
~~com~~.
~~Prashant~~.
~~S24~~.

To create a application to create a font and
colours and display fast message when the display.

(In Click has been implemented successfully.)

EX NO: 3 Scientific Calculator.

3.08 24

AIM:

To create a Scientific calculator app in android studio using Java.

Procedure:

1. Create activity - main .xml file before that we have to create new project and select empty views activity.
2. In activity - main - xml file we have to create linear layout which contain all the information of buttons.
3. we have to create text views which contains text information and color, background color of the text.
4. we have to create the input and output file.
5. Then we have to create .xml .java before that we have to import package.
6. we should declare all Buttons.
7. we have to create all the methods for those buttons with required operation.
8. Then we have to select the virtual device.
9. run the application.
10. test the all the functionalities of the buttons.

MainActivity.java

```
package com.example.ex_3;

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 {
    Button
    b1,b2,b3,b4,b5,b6,b7,b8,b9,b0,bdot,bpi,bequal,bplus,bmin,bmul,
    bdiv,binv,bsqrt,bsquare,bfact,bln,blog,btan,bcos,bsin,bb1,bb2,bc,b
    ac;
    TextView tvmain,tvsec;
    String pi = "3.14159265";

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

        b1 = findViewById(R.id.b1);
        b2 = findViewById(R.id.b2);
        b3 = findViewById(R.id.b3);
        b4 = findViewById(R.id.b4);
        b5 = findViewById(R.id.b5);
        b6 = findViewById(R.id.b6);
        b7 = findViewById(R.id.b7);
        b8 = findViewById(R.id.b8);
        b9 = findViewById(R.id.b9);
        b0 = findViewById(R.id.b0);
        bpi = findViewById(R.id.bpi);
        bdot = findViewById(R.id.bdot);
        bequal = findViewById(R.id.bequal);
        bplus = findViewById(R.id.bplus);
        bmin = findViewById(R.id.bmin);
        bmul = findViewById(R.id.bmul);
        bdiv = findViewById(R.id.bdiv);
        binv = findViewById(R.id.binv);
        bsqrt = findViewById(R.id.sqrt);
        bsquare = findViewById(R.id.square);
        bfact = findViewById(R.id.bfact);
        bln = findViewById(R.id.bln);
        blog = findViewById(R.id.blog);
        btan = findViewById(R.id.btan);
        bsin = findViewById(R.id.bsin);
        bcos = findViewById(R.id.bcos);
        bb1 = findViewById(R.id.bb1);
        bb2 = findViewById(R.id.bb2);
        bc = findViewById(R.id.bc);
        bac = findViewById(R.id.bac);

        tvmain = findViewById(R.id.tvmain);
        tvsec = findViewById(R.id.tvsec);

        //onclick listeners
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"1");
            }
        });
        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"2");
            }
        });
        b3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"3");
            }
        });
        b4.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"4");
            }
        });
        b5.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"5");
            }
        });
        b6.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"6");
            }
        });
        b7.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"7");
            }
        });
        b8.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"8");
            }
        });
        b9.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"9");
            }
        });
        b0.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+"0");
            }
        });
        bdot.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText(tvmain.getText()+".");
            }
        });
        bac.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tvmain.setText("");
                tvsec.setText("");
            }
        });
        bc.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String val = tvmain.getText().toString();
                val = val.substring(0, val.length() - 1);
                tvmain.setText(val);
            }
        });
    }
}
```

```

});  

bplus.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"+");
    }
});  

bminus.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"-");
    }
});  

bmul.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"x");
    }
});  

bdiv.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"/");
    }
});  

bsqrt.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        String val = tvmain.getText().toString();  

        double r = Math.sqrt(Double.parseDouble(val));  

        tvmain.setText(String.valueOf(r));
    }
});  

bb1.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"(");
    }
});  

bb2.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+")");
    }
});  

bp1.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvsec.setText(bpi.getText());  

        tvmain.setText(tvmain.getText()+pi);
    }
});  

bsin.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"sin");
    }
});  

bcos.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"cos");
    }
});  

btan.setOnClickListener(new View.OnClickListener() {  

    @Override  

    public void onClick(View v) {  

        tvmain.setText(tvmain.getText()+"tan");
    }
});

```

binv.setOnClickListener(new View.OnClickListener() {
 @Override
 public void onClick(View v) {
 tvmain.setText(tvmain.getText()+"**"+(-1));
 }
});
bfact.setOnClickListener(new View.OnClickListener() {
 @Override
 public void onClick(View v) {
 int val = Integer.parseInt(tvmain.getText().toString());
 int fact = factorial(val);
 tvmain.setText(String.valueOf(fact));
 tvsec.setText(val+"!");
 }
});
bsquare.setOnClickListener(new View.OnClickListener() {
 @Override
 public void onClick(View v) {
 double d = Double.parseDouble(tvmain.getText().toString());
 double square = d*d;
 tvmain.setText(String.valueOf(square));
 tvsec.setText(d+"^2");
 }
});
bln.setOnClickListener(new View.OnClickListener() {
 @Override
 public void onClick(View v) {
 tvmain.setText(tvmain.getText()+"ln");
 }
});
blog.setOnClickListener(new View.OnClickListener() {
 @Override
 public void onClick(View v) {
 tvmain.setText(tvmain.getText()+"log");
 }
});
bequal.setOnClickListener(new View.OnClickListener() {
 @Override
 public void onClick(View v) {
 String val = tvmain.getText().toString();
 String replacedstr = val.replace('+','/').replace('x','*');
 double result = eval(replacedstr);
 tvmain.setText(String.valueOf(result));
 tvsec.setText(val);
 }
});

//factorial function
int factorial(int n)
{
 return (n==1 || n==0) ? 1 : n*factorial(n-1);
}

//eval function
public static double eval(final String str) {
 return new Object() {
 int pos = -1, ch;

 void nextChar() {
 ch = (++pos < str.length()) ? str.charAt(pos) : -1;
 }

 boolean eat(int charToEat) {
 while (ch == ' ') nextChar();
 if (ch == charToEat) {
 nextChar();
 }
 }
 };
}

```

    -> addSubtract();
}

-> multiplyDivide();
}

double parse() {
    nextChar();
    double a = parseExpression();
    if (pos < str.length()) throw new RuntimeException("Unexpected " + (char)ch);
    return a;
}

// Grammar:
// expression : term | expression + term | expression - term
// term : factor | term * factor | term / factor
// factor : factor | - factor | ( expression )
//          | number | functionName factor | factor ^ factor

double parseExpression() {
    double a = parseTerm();
    for (;;) {
        if (eat('+')) a += parseTerm(); // addition
        else if (eat('-')) a -= parseTerm(); // subtraction
        else return a;
    }
}

double parseTerm() {
    double a = parseFactor();
    for (;;) {
        if (eat('*')) a *= parseFactor(); // multiplication
        else if (eat('/')) a /= parseFactor(); // division
        else return a;
    }
}

double parseFactor() {
    if (eat('+')) return parseFactor(); // unary plus
    if (eat('-')) return -parseFactor(); // unary minus

    double a;
    int startPos = this.pos;
    if (eat('(')) { // parentheses
        a = parseExpression();
        eat(')');
    } else if ((ch >='0' && ch <='9') || ch == '.') { // numbers
        while ((ch >='0' && ch <='9') || ch == '.') nextChar();
        a = Double.parseDouble(str.substring(startPos, this.pos));
    } else if (ch == 'e' || ch == 'E') { // functions
        while (ch == 'e' || ch == 'E') nextChar();
        String func = str.substring(startPos, this.pos);
        a = parseFactor();
        if (func.equals("sqrt")) a = Math.sqrt(a);
        else if (func.equals("sin")) a =
            Math.sin(Math.toRadians(a));
        else if (func.equals("cos")) a =
            Math.cos(Math.toRadians(a));
        else if (func.equals("tan")) a =
            Math.tan(Math.toRadians(a));
        else if (func.equals("log")) a = Math.log10(a);
        else if (func.equals("ln")) a = Math.log(a);
        else throw new RuntimeException("Unknown function");
    } else {
        throw new RuntimeException("Unexpected " +
            (char)ch);
    }
}

```

Activity_Main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    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"
    android:orientation="vertical"
    android:weightSum="10"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/tvsec"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:background="@android:color/holo_red_dark"
        android:text="Calculator"
        android:textColor="#ff6f6f6"
        android:textSize="40sp"
        android:padding="15dp"
        android:gravity="start"

        android:maxLines="1"
        android:layout_weight="1"
        tools:ignore="ExtraText">
    </TextView>

    <TextView
        android:id="@+id/tvmain"
        android:layout_width="match_parent"
        android:layout_height="25dp"
        android:layout_weight="2"
        android:background="@color/white"
        android:gravity="bottom"
        android:maxLines="1"
        android:padding="10dp"
        android:text=""
        android:textAlignment="viewEnd"
        android:textColor="@color/black"
        android:textSize="50sp">
    </TextView>

    <LinearLayout
        android:layout_weight="7"
        android:orientation="vertical"
        android:layout_width="match_parent"
        android:layout_height="0dp">
        <LinearLayout
            android:orientation="vertical"
            android:weightSum="7"
            android:layout_width="match_parent"
            android:layout_height="match_parent">
            <LinearLayout
                android:layout_weight="1"
                android:orientation="horizontal"
                android:layout_width="match_parent"
                android:layout_height="match_parent">
                <LinearLayout
                    android:orientation="horizontal"
                    android:weightSum="4"
                    android:layout_width="match_parent"
                    android:layout_height="match_parent">
                    <Button
                        android:id="@+id/bac"
                        android:text="AC"
                        android:textSize="30sp">
                    </Button>
```

```
        android:backgroundTint="@android:color/holo_orange_light"
        android:textColor="@color/black"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">>

    </Button>
    <Button
        android:id="@+id/bc"
        android:text="C"
        android:textSize="30sp"

        android:backgroundTint="@android:color/holo_orange_light"
        android:textColor="@color/black"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">>

    </Button>
    <Button
        android:id="@+id/bb1"
        android:text="("
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#ffa500"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">>

    </Button>
    <Button
        android:id="@+id/bb2"
        android:text ")"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#ffa500"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">>

    </Button>
</LinearLayout>
</LinearLayout>
<LinearLayout
    android:layout_weight="1"
    android:orientation="horizontal"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
<LinearLayout
    android:orientation="horizontal"
    android:weightSum="5"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <Button
        android:id="@+id-bsin"
        android:text="sin"
        android:textAllCaps="false"
        android:textSize="20sp"
        android:background="#000"
        android:textColor="#ffa500"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">>

    </Button>
    <Button
        android:id="@+id/bcos"
        android:text="cos"
        android:textAllCaps="false"
        android:layout_width="match_parent"
        android:layout_height="match_parent">>

    </Button>
</LinearLayout>
```

```
    android:textSize="20sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">>

</Button>
<Button
    android:id="@+id/btan"
    android:text="tan"
    android:textAllCaps="false"
    android:textSize="20sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

</Button>
<Button
    android:id="@+id/blog"
    android:text="log"
    android:textAllCaps="false"
    android:textSize="20sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

</Button>
<Button
    android:id="@+id/blin"
    android:text="ln"
    android:textAllCaps="false"
    android:textSize="20sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

</Button>
<Button
    android:id="@+id/bdiv"
    android:text="+"
    android:textSize="30sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">>

</Button>
<Button
    android:id="@+id/bfact"
    android:text="x1"
    android:textAllCaps="false"
    android:textSize="30sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">>

</Button>
<Button
    android:id="@+id/bsquare"
    android:text="V"
    android:textAllCaps="false"
    android:textSize="30sp"
    android:background="#000"
    android:textColor="#ffa500"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">>

</Button>
<Button
    android:id="@+id/bt7"
    android:text="7"
    android:textSize="30sp"
    android:background="#000"
    android:textColor="#ffff00"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">>

</Button>
<Button
    android:id="@+id/bt8"
    android:text="8"
    android:textSize="30sp"
    android:background="#000"
    android:textColor="#ffff00"
    android:layout_weight="1"
    android:layout_width="match_parent"
    android:layout_height="match_parent">>
```

```
        android:text="8"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
    <Button
        android:id="@+id/b9"
        android:text="9"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
    <Button
        android:id="@+id/bmul"
        android:text="x"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#ffa500"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
</LinearLayout>
</LinearLayout>
<LinearLayout
    android:layout_weight="1"
    android:orientation="horizontal"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
<LinearLayout
    android:orientation="horizontal"
    android:weightSum="4"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
<Button
        android:id="@+id/b4"
        android:text="4"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
<Button
        android:id="@+id/b5"
        android:text="5"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
<Button
        android:id="@+id/b6"
        android:text="6"
        android:textSize="30sp"
        android:background="#000"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
<Button
        android:id="@+id/bmin"
        android:text="-"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#ffa500"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

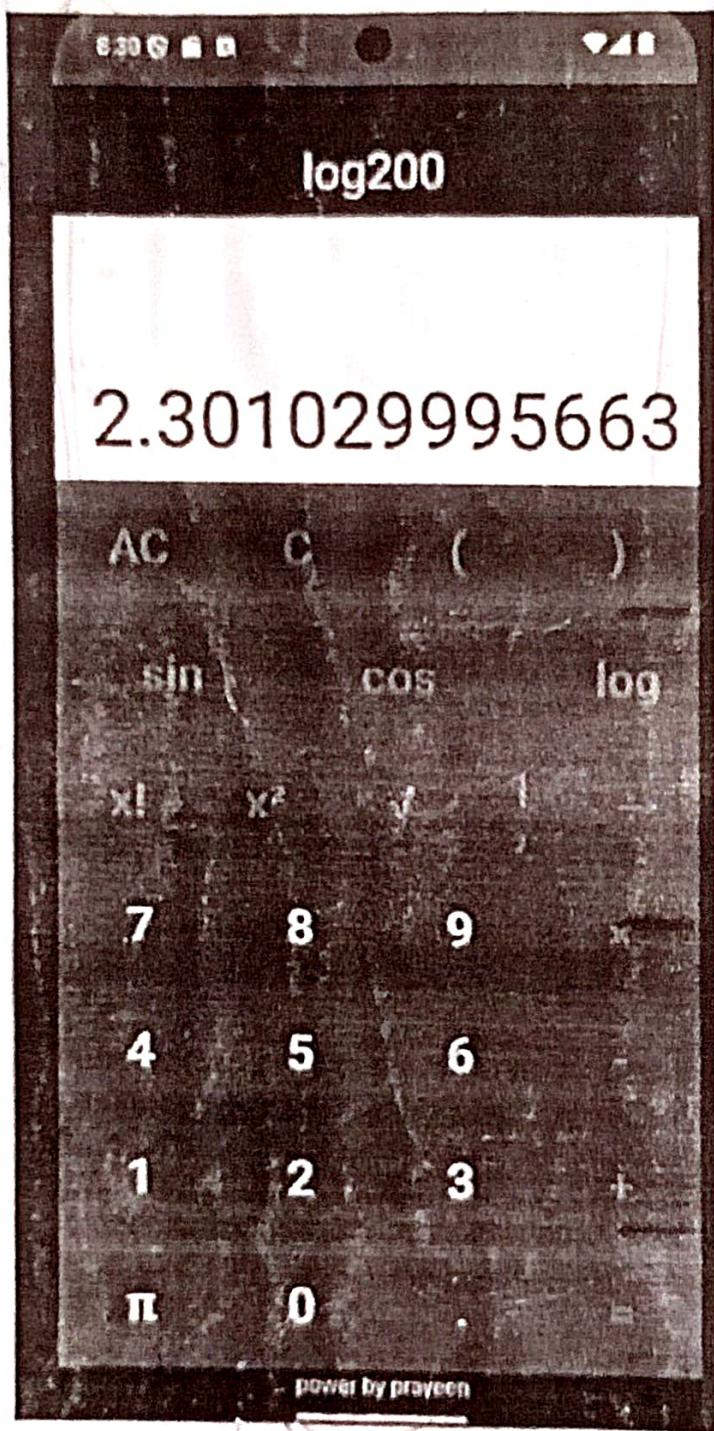
    </Button>
</LinearLayout>
</LinearLayout>
<LinearLayout
    android:layout_weight="1"
    android:orientation="horizontal"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
<LinearLayout
    android:orientation="horizontal"
    android:weightSum="4"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
<Button
        android:id="@+id/b1"
        android:text="1"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
<Button
        android:id="@+id/b2"
        android:text="2"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
<Button
        android:id="@+id/b3"
        android:text="3"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#fff"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
<Button
        android:id="@+id/bplus"
        android:text="+"
        android:textSize="30sp"
        android:background="#000"
        android:textColor="#ffa500"
        android:layout_weight="1"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    </Button>
```



```

    android:layout_height="match_parent">

```

</Button>

</LinearLayout>

<LinearLayout>

android:layout_weight="1"

android:orientation="horizontal"

android:layout_width="match_parent"

android:layout_height="match_parent">

<LinearLayout>

android:orientation="horizontal"

android:weightSum="4"

android:layout_width="match_parent"

android:layout_height="match_parent">

<Button>

android:id="@+id/bpi"

android:text="π"

android:textSize="30sp"

android:background="#000"

android:textColor="#fff"

android:layout_weight="1"

android:layout_width="match_parent"

android:layout_height="match_parent">

</Button>

<Button>

android:id="@+id/b0"

android:text="0"

android:textSize="30sp"

android:background="#000"

android:textColor="#fff"

android:layout_weight="1"

android:layout_width="match_parent"

android:layout_height="match_parent">

</Button>

<Button>

android:id="@+id/bdot"

android:layout_width="match_parent"

android:layout_height="match_parent"

android:layout_weight="1"

android:background="#000"

android:text=""

android:textColor="#fff"

android:textSize="30sp">

</Button>

<Button>

android:id="@+id/bequal"

android:text="="

android:textSize="40sp"

android:backgroundTint="@android:color/holo_orange_light"

android:textColor="@color/black"

android:layout_weight="1"

android:layout_width="match_parent"

android:layout_height="match_parent">

</Button>

</LinearLayout>

</LinearLayout>

<TextView>

android:id="@+id/textView"

android:layout_width="match_parent"

android:layout_height="30dp"

android:layout_weight="1"

android:textColor="#fff"

android:background="#000"

android:textAlignment="center"

android:textSize="20dp"

android:text="power by praveen raj" />

</LinearLayout>

</LinearLayout>

Bent:

To create a Scientific calculator app in android studio using Java has been implemented successfully!

EX NO: 4

10.8.21

Student Database

Aim:

To create a student database app in android studio using Java.

Procedure:

1. Create a new project \rightarrow open Android Studio \rightarrow new project \rightarrow empty view activity \rightarrow name of project.
2. Go to Gradle build and add more dependencies as required for the student database.
3. Now go to res/layout and create three new activities add activity, view activity, delete activity.
4. Add the buttons as required for the each activity button as add, view, delete.
5. Check for the android compatible side to be as the target as to run the program with its compatibility.
6. Go to Java/com.example.studentdatabaseapp and create three activity and main activity.
7. Get the details of students like roll no, name and department.
8. Now create an internal button as add base, and delete data.
9. Set emulator device as phone.
10. Test all the functions 2 buttons are working.

AndroidManifest.xml

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

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Database_exp3"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

DatabaseHelper.java

```
package com.example.database_exp3;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

public class DatabaseHelper extends SQLiteOpenHelper {

    private static final String DATABASE_NAME = "student.db";
    private static final int DATABASE_VERSION = 2; // Updated version

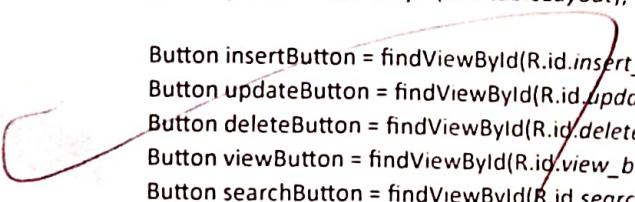
    private static final String TABLE_NAME = "Student";
    private static final String COLUMN_NAME = "Name";
    private static final String COLUMN_ROLL_NO = "RollNo";
    private static final String COLUMN_MARKS = "Marks";
    private static final String COLUMN_AGE = "Age";
    private static final String COLUMN_REGISTER_NO = "RegisterNo";
    private static final String COLUMN_ADDRESS = "Address";

    public DatabaseHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }

    @Override
```

```
+ " = ?", new String[]{registerNo});  
}  
}
```

MainActivity.java

```
package com.example.database_exp3;  
  
import android.database.Cursor;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.TableLayout;  
import android.widget TableRow;  
import android.widget.TextView;  
import android.widget.Toast;  
import androidx.appcompat.app.AppCompatActivity;  
import com.example.database_exp3.R;  
  
public class MainActivity extends AppCompatActivity {  
  
    private com.example.database_exp3.DatabaseHelper dbHelper;  
    private EditText name, rollNo, marks, age, registerNo, address, searchRegisterNo;  
    private TableLayout tableLayout;  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        dbHelper = new com.example.database_exp3.DatabaseHelper(this);  
        name = findViewById(R.id.name);  
        rollNo = findViewById(R.id.roll_no);  
        marks = findViewById(R.id.marks);  
        age = findViewById(R.id.age);  
        registerNo = findViewById(R.id.register_no);  
        address = findViewById(R.id.address);  
        searchRegisterNo = findViewById(R.id.search_register_no);  
        tableLayout = findViewById(R.id.tableLayout);  
  
          
        Button insertButton = findViewById(R.id.insert_button);  
        Button updateButton = findViewById(R.id.update_button);  
        Button deleteButton = findViewById(R.id.delete_button);  
        Button viewButton = findViewById(R.id.view_button);  
        Button searchButton = findViewById(R.id.search_button);  
  
        insertButton.setOnClickListener(v -> {  
            dbHelper.insertStudent(name.getText().toString(), Integer.parseInt(marks.getText().toString()),  
                Integer.parseInt(age.getText().toString()), registerNo.getText().toString(), address.getText().toString());  
            Toast.makeText(MainActivity.this, "Inserted!", Toast.LENGTH_SHORT).show();  
            clearInputFields();  
        });  
  
        updateButton.setOnClickListener(v -> {  
            dbHelper.updateStudent(Integer.parseInt(rollNo.getText().toString()), name.getText().toString(),  
                marks.getText().toString(), age.getText().toString(), registerNo.getText().toString());  
        });  
    }  
}
```

```
        tableLayout.addView(row);
    }
}

private void displayStudentDataByRegisterNo(String registerNo) {
    tableLayout.removeAllViews();

    // Add table header
    TableRow header = new TableRow(this);
    header.addView(createTextView("Roll No", true));
    header.addView(createTextView("Name", true));
    header.addView(createTextView("Marks", true));
    header.addView(createTextView("Age", true));
    header.addView(createTextView("Register No", true));
    header.addView(createTextView("Address", true));
    tableLayout.addView(header);

    Cursor cursor = dbHelper.getStudentByRegisterNo(registerNo);
    if (cursor.getCount() == 0) {
        TableRow noDataRow = new TableRow(this);
        TextView noDataText = createTextView("No Records Found", false);
        noDataText.setTop(3);
        noDataRow.addView(noDataText);
        tableLayout.addView(noDataRow);
        return;
    }

    while (cursor.moveToNext()) {
        TableRow row = new TableRow(this);
        row.addView(createTextView(String.valueOf(cursor.getInt(0)), false));
        row.addView(createTextView(cursor.getString(1), false));
        row.addView(createTextView(String.valueOf(cursor.getInt(2)), false));
        row.addView(createTextView(String.valueOf(cursor.getInt(3)), false));
        row.addView(createTextView(cursor.getString(4), false));
        row.addView(createTextView(cursor.getString(5), false));
        tableLayout.addView(row);
    }
}

private TextView createTextView(String text, boolean isHeader) {
    TextView textView = new TextView(this);
    textView.setText(text);
    textView.setPadding(8, 8, 8, 8);
    if (isHeader) {
        textView.setTextAppearance(android.R.style.TextAppearance_Material_Small);
        textView.setTypeface(null, android.graphics.Typeface.BOLD);
    }
    return textView;
}
```

activity_main_xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#D5D515"
    android:orientation="vertical"
    android:padding="16dp"> <!-- Beige background color -->

    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:autofillHints=""
        android:hint="Name"
        android:minHeight="30sp" />

    <EditText
        android:id="@+id/roll_no"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Roll No"
        android:inputType="number"
        android:minHeight="30sp" />

    <EditText
        android:id="@+id/marks"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Marks"
        android:inputType="number"
        android:minHeight="30sp" />

    <EditText
        android:id="@+id/age"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Age"
        android:inputType="number"
        android:minHeight="30sp" />

    <EditText
        android:id="@+id/register_no"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Register No"
        android:minHeight="30sp" />

    <EditText
        android:id="@+id/address"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Address"
        android:minHeight="30sp" />

    <Button
        android:id="@+id/insert_button"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="5dp"
        android:layout_marginBottom="5dp"
        android:background="#000000"
        android:text="Insert"
        android:textColor="#FFFFFF" />

    <Button
        android:id="@+id/update_button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="5dp"
        android:layout_marginBottom="5dp"
        android:background="#000000"
        android:text="Update"
        android:textColor="#FFFFFF" />

    <Button
        android:id="@+id/delete_button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="2dp"
        android:layout_marginBottom="2dp"
        android:background="#000000"
        android:text="Delete"
        android:textColor="#FFFFFF" />

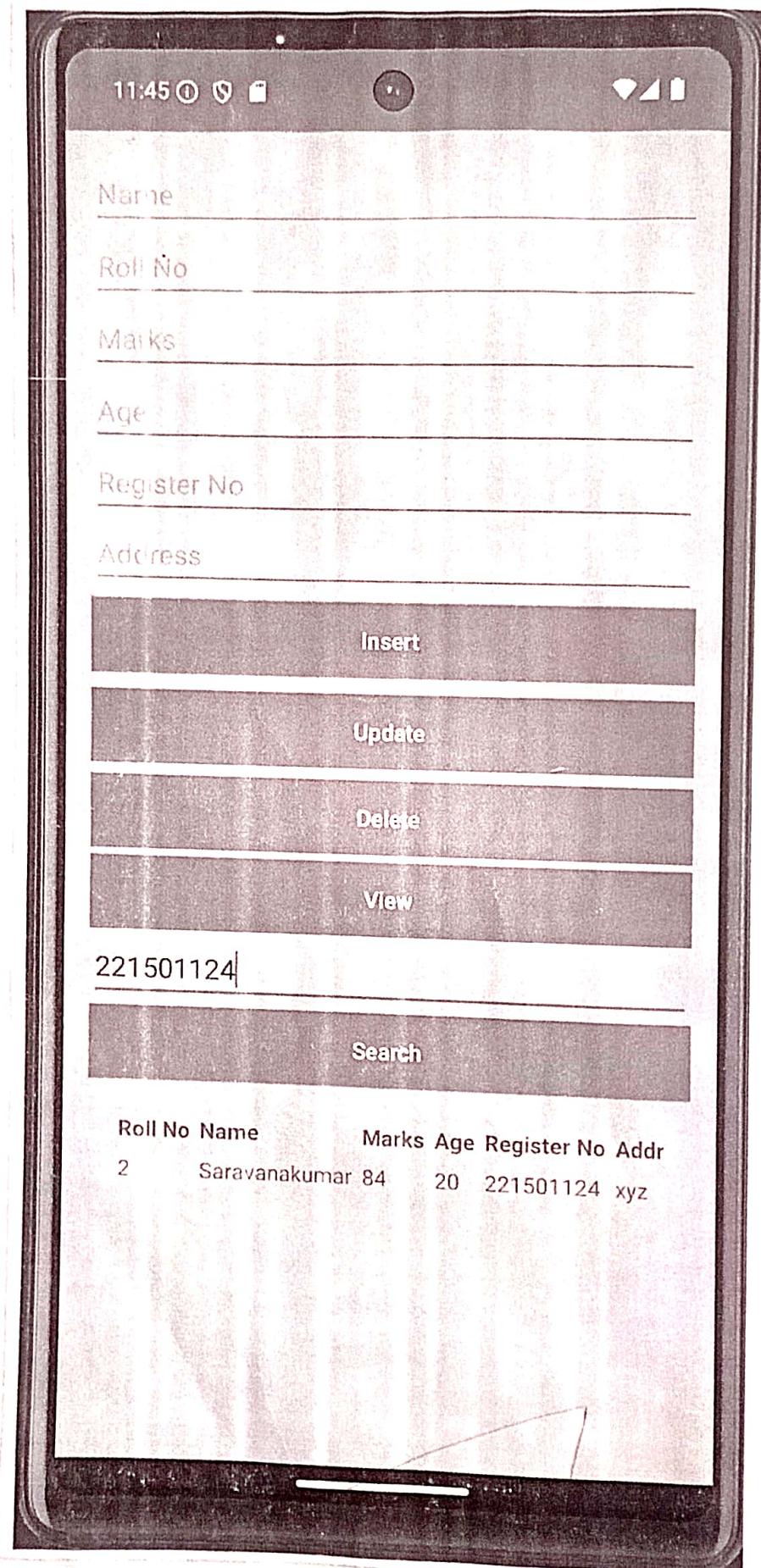
    <Button
        android:id="@+id/view_button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="2dp"
        android:layout_marginBottom="2dp"
        android:background="#000000"
        android:text="View"
        android:textColor="#FFFFFF" />

    <EditText
        android:id="@+id/search_register_no"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Search by Register No"
        android:minHeight="2dp" />

    <Button
        android:id="@+id/search_button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="2dp"
        android:layout_marginBottom="2dp"
        android:background="#000000"
        android:text="Search"
        android:textColor="#FFFFFF" />

<ScrollView
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1"
    android:contentDescription="@string/app_name"
    android:padding="16dp">

    <TableLayout
        android:id="@+id/tableLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:stretchColumns="1">
        <!-- Data rows will be added dynamically here -->
    </TableLayout>
</ScrollView>
</LinearLayout>
```



~~R. P. 3/18/11~~

Result:

To create a student database app in android studio using Java has been implemented successfully.

ExNo: 5

17.8.24

Java validation

Aim:

To create a Java validation app in android studio

using Java.

Procedure:

1. Create a new project → open → android studio → new project → empty view Activity → Name of Project → set language Java → finish.
2. Define the layout in activity_main.xml with edit text fields for username and ID and a button to trigger validation.

3. In main activity.java set up edit text fields to collect user input and a button. To start the validation process.

Process:

4. Check if the username is empty and display an appropriate message.
5. Ensure the username contains only alphabets.
6. Verify that the ID is not empty and is a 4-digit number.
7. Show success message if all validation pass.
8. And give a pop up notification when created successfully.
9. If not message contains not satisfied.
10. Set an on click listener for the validate button to the validate input method when clicked.

Android_manifest.xml

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

    <application
        android:allowBackup="true"
        android:datasync="true"
        android:fullBackupContent="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Signinandup"
        tools:targetApi="31">
        <activity
            android:name=".LoginActivity"
            android:exported="false" />
        <activity
            android:name=".SignUpActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

LoginActivity.java:

```
package com.example.signinandup;

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

import android.graphics.drawable.ColorDrawable;
import android.os.Bundle;
import android.annotation.NonNull;
import android.content.Intent;
import android.text.TextUtils;
import android.util.Patterns;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import com.google.android.gms.tasks.OnCompleteListener;
import com.google.android.gms.tasks.OnFailureListener;
import com.google.android.gms.tasks.OnSuccessListener;
import com.google.android.gms.tasks.Task;
import com.google.firebase.auth.AuthResult;
import com.google.firebase.auth.FirebaseAuth;

public class LoginActivity extends AppCompatActivity {

    private EditText loginEmail, loginPassword;
    private TextView signupRedirectText;
    private Button loginButton;
    private FirebaseAuth auth;
    private TextView forgotPassword;
```

MainActivity.java:

```

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

loginEmail = findViewById(R.id.login_email);
loginPassword = findViewById(R.id.login_password);
loginButton = findViewById(R.id.login_button);
signUpRedirectText = findViewById(R.id.signUpRedirectText);
forgotPassword = findViewById(R.id.forgot_password);

auth = FirebaseAuth.getInstance();

loginButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String email = loginEmail.getText().toString();
        String pass = loginPassword.getText().toString();

        if (!email.isEmpty() & Patterns.EMAIL_ADDRESS.matcher(email).matches()) {
            if (!pass.isEmpty()) {
                auth.signInWithEmailAndPassword(email, pass)
                    .addOnSuccessListener(new OnSuccessListener<AuthResult>() {
                        @Override
                        public void onSuccess(AuthResult authResult) {
                            Toast.makeText(LoginActivity.this, "Login Successful", Toast.LENGTH_SHORT).show();
                            startActivity(new Intent(LoginActivity.this, MainActivity.class));
                            finish();
                        }
                    })
                    .addOnFailureListener(new OnFailureListener() {
                        @Override
                        public void onFailure(@NonNull Exception e) {
                            Toast.makeText(LoginActivity.this, "Login failed", Toast.LENGTH_SHORT).show();
                        }
                    });
            } else {
                loginPassword.setError("Empty fields are not allowed");
            }
        } else if (email.isEmpty()) {
            loginEmail.setError("Empty fields are not allowed");
        } else {
            loginEmail.setError("Please enter a correct email");
        }
    }
});

signUpRedirectText.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        startActivity(new Intent(LoginActivity.this, SignUpActivity.class));
    }
});

forgotPassword.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        AlertDialog.Builder builder = new AlertDialog.Builder(LoginActivity.this);
        View dialogView = getLayoutInflater().inflate(R.layout.dialog_forgot, null);
        EditText emailBox = dialogView.findViewById(R.id.emailBox);

        builder.setView(dialogView);
        AlertDialog dialog = builder.create();

        dialogView.findViewById(R.id.btnReset).setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String userEmail = emailBox.getText().toString();

                if (TextUtils.isEmpty(userEmail) || !Patterns.EMAIL_ADDRESS.matcher(userEmail).matches()) {
                    Toast.makeText(LoginActivity.this, "Enter a valid registered email id", Toast.LENGTH_SHORT).show();
                    return;
                }
                auth.sendPasswordResetEmail(userEmail).addOnCompleteListener(new OnCompleteListener<Void>() {
                    @Override
                    public void onComplete(@NonNull Task<Void> task) {
                        if (task.isSuccessful()) {
                            Toast.makeText(LoginActivity.this, "Check your email", Toast.LENGTH_SHORT).show();
                            dialog.dismiss();
                        } else {
                            Toast.makeText(LoginActivity.this, "Unable to send, failed", Toast.LENGTH_SHORT).show();
                        }
                    }
                });
            }
        });

        dialogView.findViewById(R.id.btnCancel).setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                dialog.dismiss();
            }
        });

        if (dialog.getWindow() != null) {
            dialog.getWindow().setBackgroundDrawable(new ColorDrawable(0));
        }
        dialog.show();
    }
});

```

Activity_login.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    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"
    android:orientation="vertical"
    android:gravity="center"
    android:background="@drawable/pagebkg"
    tools:context=".SignUpActivity">

    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="30dp"
        app:cardCornerRadius="30dp"
        app:cardElevation="20dp">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="vertical"
            android:layout_gravity="center_horizontal"
            android:padding="24dp"
            android:background="@drawable/custom_edittext">

            <TextView
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:text="Sign Up"
                android:textSize="36sp"
                android:textAlignment="center"
                android:textStyle="bold"
                android:textColor="@color/lavender"/>

            <EditText
                android:layout_width="match_parent"
                android:layout_height="50dp"
                android:id="@+id/signup_email"
                android:background="@drawable/custom_edittext"
                android:layout_marginTop="40dp"
                android:padding="8dp"
                android:hint="Email"
                android.drawableLeft="@drawable/baseline_person_24"
                android.drawablePadding="8dp"
                android:textColor="@color/black"/>

            <EditText
                android:layout_width="match_parent"
                android:layout_height="50dp"
                android:id="@+id/signup_password"
                android:background="@drawable/custom_edittext"
                android:layout_marginTop="20dp"
                android:padding="8dp"
                android:hint="Password"
                android.drawableLeft="@drawable/ic_baseline_lock_24"
                android.drawablePadding="8dp"
                android:textColor="@color/black"/>

            <Button
                android:layout_width="match_parent"
                android:layout_height="60dp"
                android:text="@string/sign_up"
                android:id="@+id/signup_button"
                android:textSize="18sp"
                android:layout_marginTop="30dp"
                android:backgroundTint="@color/lavender"
                app:cornerRadius="20dp"/>

            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:id="@+id/loginRedirectText"
                android:text="@string/already_an_user_login"
                android:layout_gravity="center"
                android:padding="8dp"
                android:layout_marginTop="10dp"
                android:textColor="@color/lavender"
                android:textSize="18sp"/>
        
    

```

Dialog.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_margin="20dp"
    android:padding="20dp"
    android:id="@+id/dialogForgot"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <androidx.constraintlayout.widget.ConstraintLayout
        android:id="@+id/dialogBox"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="@drawable/white_box"
        app:layout_constraintTop_toTopOf="parent">
```

7:32 S

Login



221501124@rajalakshmi.edu.in



.....

Login

Forgot Password?

Not yet registered? Sign Up

Login Failed

```

<TextView
    android:id="@+id/forgotTitle"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:background="@drawable/lavender_round"
    android:drawableLeft="@drawable/baseline_lock_24"
    android:drawablePadding="10dp"
    android:padding="10dp"
    android:text="Forgot Password"
    android:textColor="@color/white"
    android:textSize="17sp"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/desc"
    android:text="Enter your email address:"
    android:layout_marginStart="20dp"
    android:layout_marginEnd="20dp"
    android:layout_marginTop="8dp"
    android:textSize="16sp"
    android:textColor="@color/lavender"
    app:layout_constraintTop_toBottomOf="@+id/forgotTitle"
    app:layout_constraintBottom_toTopOf="@+id/emailBox"/>

<EditText
    android:id="@+id/emailBox"
    android:layout_width="300dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginBottom="30dp"
    android:backgroundTint="@color/lavender"
    android:maxLines="1"
    android:minHeight="48dp"
    android:textColor="@color/lavender"
    android:textSize="16sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/forgotTitle"
    tools:ignore="SpeakableTextPresentCheck" />

<Button
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:id="@+id/btnCancel"
    android:layout_marginStart="40dp"
    android:layout_marginEnd="10dp"
    android:text="Cancel"
    android:textColor="@color/white"
    android:textSize="14sp"
    android:cornerRadius="20dp"
    android:layout_marginBottom="8dp"
    android:layout_marginTop="10dp"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/emailBox"
    app:layout_constraintBottom_toBottomOf="@+id/dialogBox"
    app:layout_constraintEnd_toStartOf="@+id/btnReset" />

<Button
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:id="@+id/btnReset"
    android:text="Reset"
    android:layout_marginStart="10dp"
    android:layout_marginBottom="8dp"
    android:layout_marginTop="10dp"
    android:layout_marginEnd="40dp"
    android:textColor="@color/white"
    android:textSize="14sp"
    android:cornerRadius="20dp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintBottom_toBottomOf="@+id/dialogBox"
    app:layout_constraintStart_toEndOf="@+id/btnCancel" />

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

```

Search by email address, phone number or user UID					Add user	C	⋮
Identifier	Providers	Created	Signed In	User UID			
221501103@rajalaksh...	✉	18 Aug 2024	18 Aug 2024	BNLHdtvMbKWJHgiuHKf0kN...			
221501124@rajalaksh...	✉	18 Aug 2024	18 Aug 2024	MBeaigBmL4grShsaroqEyAb1...			
221501115@rajalaksh...	✉	18 Aug 2024	18 Aug 2024	IlwOvHUYjSbfuRk3lUTINtmm...			

7:30



Welcome to the app
User

Log Out

Login Successful

~~Result~~ 3/8/21
To create a user validation app in android studio using Java has been implemented successfully.

ExNo: 6

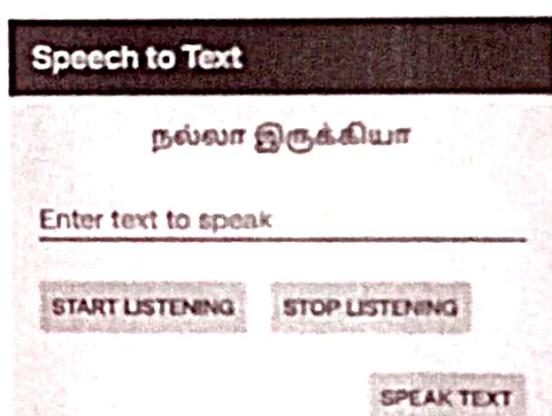
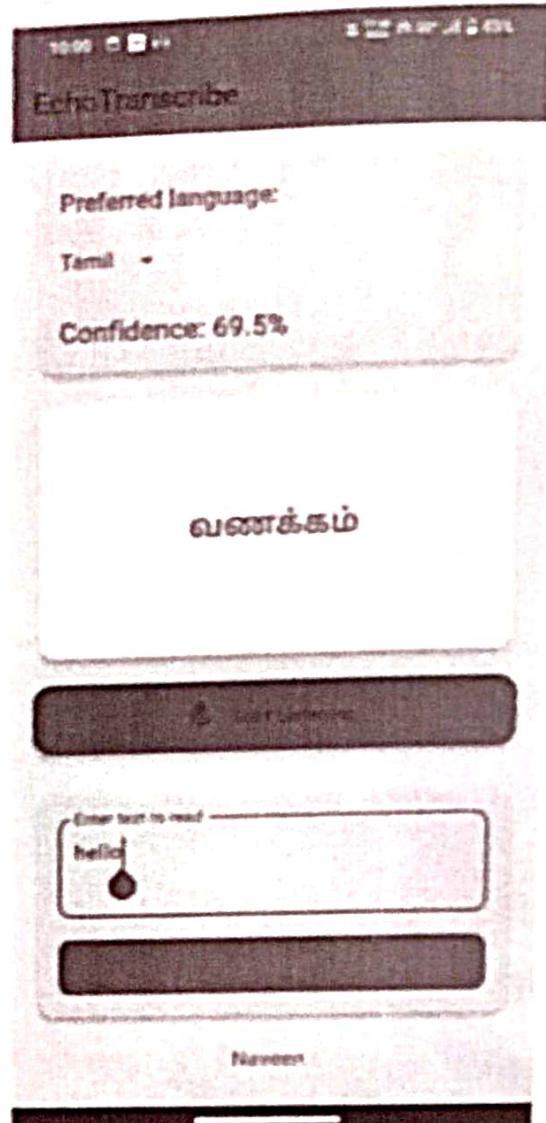
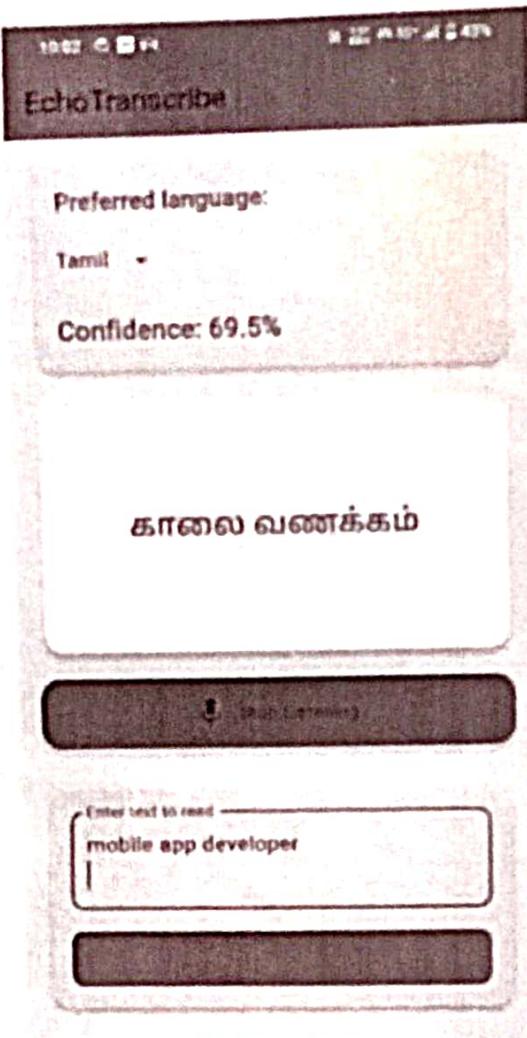
Develop an android app to perform Text to Speech and Speech to text.

Aim:

To develop an android application to perform the following (ML Based application).

Procedure :

- * Initialize flutter project & configure necessary dependencies like flutter tts.
- * Implementation of text-to-speech functionality which supports for both English & other languages.
- * Setup speech to text functionality allowing user to convert speech words into text.
- * Add device support for both languages in TTS & STT features.
- * Test the application
- * Deploy the application on your devices.



```

Mad exp 6
import
'package:flutter/material.dart';
      import
'package:speech_to_text/speech_
to_text.dart' as stt;
import
'package:flutter_tts/flutter_tts.dar
t';
void main() {runApp(const
SpeechToTextApp());}
}

class SpeechToTextApp extends
 StatelessWidget {
const
SpeechToTextApp({super.key});

@Override
Widget build(BuildContext
context) {
return MaterialApp(
debugShowCheckedModeBanner:
false,
home: const SpeechToTextHome(),
theme: ThemeData(
primarySwatch: Colors.teal,
visualDensity:
VisualDensity.adaptivePlatformDe
nsity,
),
);
}
}

class SpeechToTextHome extends
 StatefulWidget {
const
SpeechToTextHome({super.key});

@Override
_SpeechToTextHomeState
createState() =>
_SpeechToTextHomeState();
}

class _SpeechToTextHomeState
extends
State<SpeechToTextHome> {
late stt.SpeechToText _speech;
late FlutterTts _flutterTts;
bool _isListening = false;
String _recognizedText = "Press
the button and start speaking";
double _confidence = 1.0;
String _selectedLanguage =
'en_US';
final TextEditingController
_textEditingController =
TextEditingController();

@Override
void initState() {
super.initState();
_speech = stt.SpeechToText();
_flutterTts = FlutterTts();
}

void _startListening() async {
bool available = await
_speech.initialize(
onStatus: (val) => print('onStatus:
$val'),
onError: (val) => print('onError:
$val'),
);
if (available) {
setState(() => _isListening = true);
_speech.listen(
onResult: (val) => setState(() {
_recognizedText =
val.recognizedWords;
if (val.hasConfidenceRating &&
val.confidence > 0) {
_confidence = val.confidence;
}
}),
localeId: _selectedLanguage,
);
} else {
setState(() => _isListening = false);
_speech.stop();
}
}

void _stopListening() {
setState(() => _isListening = false);
_speech.stop();
}

void _onLanguageChanged(String?
language) {
setState(() {
_selectedLanguage = language!;
});
}

Future<void> _speakText() async {
await
_flutterTts.setLanguage(_selected
Language);
await
_flutterTts.speak(_textEditingController.text);
}

@Override
Widget build(BuildContext
context) {
return Scaffold(
appBar: AppBar(
title: const Text(
'EchoTranscribe',
style: TextStyle(fontWeight:
FontWeight.bold),
),
backgroundColor:
Colors.teal[700],
),
body: Padding(
padding: const
EdgeInsets.all(16.0),
child: Column(
crossAxisAlignment:
CrossAxisAlignment.stretch,
children: <Widget>[
// Speech to Text Section
Card(
color: Colors.teal[50],
shape: RoundedRectangleBorder(
borderRadius:
BorderRadius.circular(15),
),
elevation: 5,
child: Padding(
padding: const
EdgeInsets.all(16.0),
child: Column(
crossAxisAlignment:
CrossAxisAlignment.start,
children: [
Text(
'Preferred language:',
style: TextStyle(
fontSize: 18.0,
fontWeight: FontWeight.w600,
color: Colors.teal[800],
),
),
const SizedBox(height: 8),
DropdownButton<String>(
value: _selectedLanguage,
items: const [
DropdownMenuItem(
value: 'en_US',
child: Text('English (US)'),
),
DropdownMenuItem(
value: 'hi_IN',
child: Text('Hindi (India)'),
),
DropdownMenuItem(
value: 'ta_IN',
child: Text('Tamil (India)'),
),
DropdownMenuItem(
value: 'te_IN',
child: Text('Telugu (India)'),
),
],
onChanged:
_onLanguageChanged,
underline: Container(),
),
const SizedBox(height: 16),
Text(
'Confidence: ${_confidence *
100.0.toStringAsFixed(1)}%',
style: TextStyle(

```

```
ml model
import sounddevice as sd
import numpy as np
import torch
import os
os.environ['TF_ENABLE_ONEDNN_OPTS'] = '0'
import torchaudio
from transformers import pipeline,
AutoProcessor,
AutoModelForSpeechSeq2Seq
# Set device and dtype
device      = "cuda" if
torch.cuda.is_available() else "cpu"
torch_dtype = torch.float16 if
torch.cuda.is_available() else
torch.float32
# Enable faster GPU operations if
available
if torch.cuda.is_available():
    torch.backends.cudnn.benchmark =
True
# Load Whisper model and processor
(using a smaller model for faster
performance)
model_id = "openai/whisper-tiny" # or
use "openai/whisper-small" for better
accuracy
model      =
AutoModelForSpeechSeq2Seq.from_p
retrained(
    model_id, torch_dtype=torch_dtype,
    low_cpu_mem_usage=True
)
model.to(device)
processor      =
AutoProcessor.from_pretrained(model
_id)
# Set the pad_token_id to
something different from
the eos_token_id
processor.tokenizer.pad_tok
en_id =
processor.tokenizer.eos_tok
en_id + 1 # Ensure they are
different
# Create ASR pipeline
pipe = pipeline(
    "automatic-speech-
recognition",
    model=model,
    tokenizer=processor.tokeniz
er,
feature_extractor=processo
r.feature_extractor,
torch_dtype=torch_dtype,
device=device,
)
```

Result :

Thus the program as been tested successfully

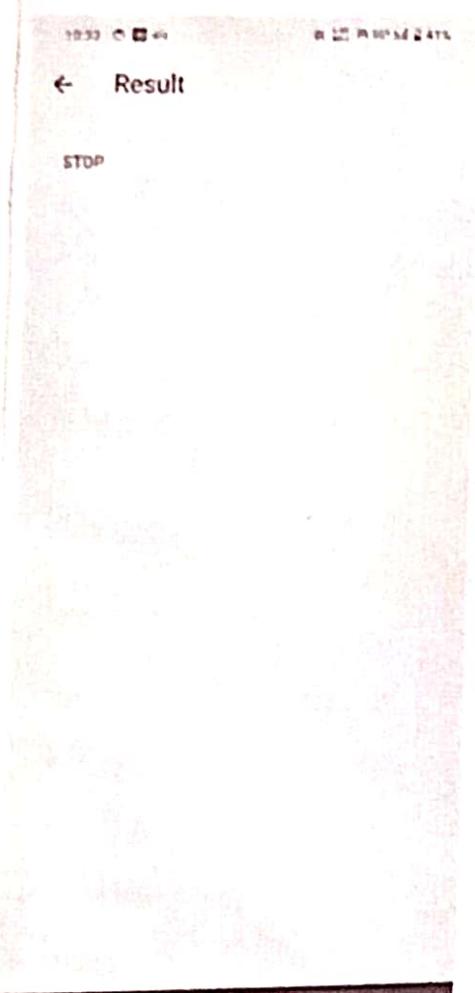
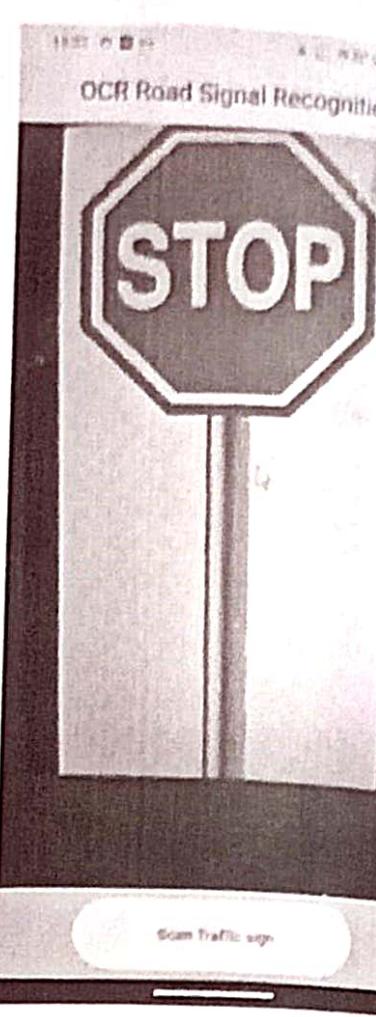
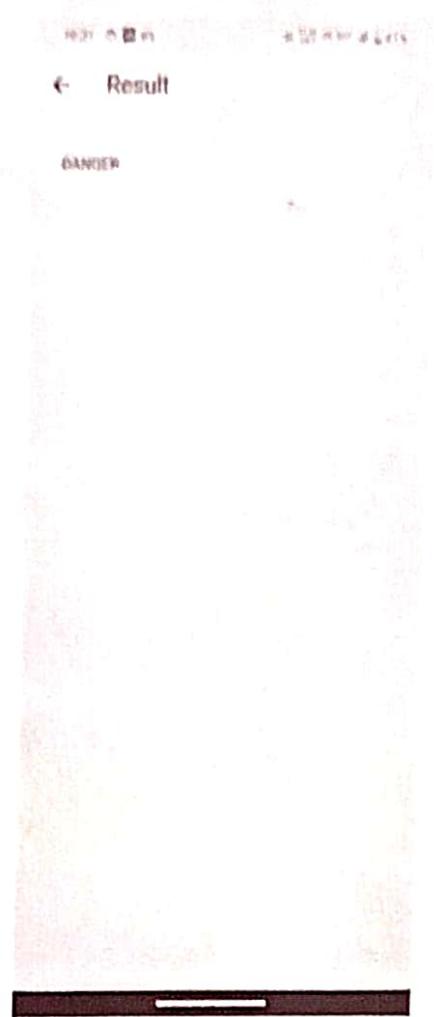
OCR ON ROAD SIGN

Aim:

Develop an application to perform the OCR on road signs detection.

Procedure:

- * Initialise a new Flutter Project:
flutter create ocr-road.
- * Train a deep learning model that can recognize text on road signs.
- * Convert the Model to a mobile compatible format at <https://tfliteconverter.tensorflow.org/>
- * Place the converted model obj file model file in your project folder.
- * Set up camera (or) Image Picker
- * Load the Model in flutter.
- * Process in a loop
- * Run the into face and Display
- * Displays OCR results.
- * Test and Optimize.



```

Exp 7
import 'dart:io';

import 'package:camera/camera.dart';
import 'package:flutter/material.dart';
import 'package:google_mlkit_text_recognition/google_mlkit_text_recognition.dart';
import 'package:permission_handler/permission_handler';
import 'package:flutter_tts/flutter_tts.dart';

import 'package:ocr/result_screen.dart';

void main() {
  runApp(const App());
}

class App extends StatelessWidget {
  const App({super.key});

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Traffic sign',
      theme: ThemeData(
        colorScheme:
          ColorScheme.fromSeed(seedColor:
            Colors.deepPurpleAccent),
        useMaterial3: true,
      ),
      debugShowCheckedModeBanner: false,
      home: const MainScreen(),
    );
  }
}

class MainScreen extends StatefulWidget {
  const MainScreen({super.key});

  @override
  State<MainScreen> createState() =>
    _MainScreenState();
}

class _MainScreenState extends State<MainScreen> with WidgetsBindingObserver {
  bool _isPermissionGranted = false;

  late final Future<void> _future;
  CameraController? _cameraController;

  final TextRecognizer = TextRecognizer();

  FlutterTts flutterTts = FlutterTts(); // TTS

  @override
  void initState() {
    super.initState();
    initTTS(); // TTS
  }
}

```

```

WidgetsBinding.instance.addObserver(this);

_fUTURE =
_requestCameraPermission();
}

Future<void> initTTS() async {
  // TTS
  await flutterTts.setLanguage("en-US"); // Set the language you want
  await flutterTts.setSpeechRate(0.5); // Adjust speech rate (1.0 is normal but too fast for my liking)
  await flutterTts.setVolume(1.0); // Adjust volume (0.0 to 1.0)
  await flutterTts.setPitch(1.0); // Adjust pitch (1.0 is normal)

  // You can set other configurations as well

  // Check if TTS is available
  // bool isAvailable = await flutterTts.isLanguageAvailable("en-US");
  // print("TTS is available: $isAvailable");
}

Future<void> speak(String text) async {
  await flutterTts.speak(text); // TTS
}

@Override
void dispose() {
  WidgetsBinding.instance.removeObserver(this);
  _stopCamera();
  textRecognizer.close();
  flutterTts.stop(); // TTS Stop
  super.dispose();
}

@Override
void didChangeAppLifecycleState(AppLifecycleState state) {
  if (_cameraController == null || !_cameraController!.value.isInitialized) {
    return;
  }

  if (state ==
    AppLifecycleState.inactive) {
    _stopCamera();
  } else if (state ==
    AppLifecycleState.resumed &&
    _cameraController != null &&
    _cameraController!.value.isInitialized)
  {
    _startCamera();
  }
}

@Override

```

```

Widget build(BuildContext context) {
  return FutureBuilder(
    future: _future,
    builder: (context, snapshot) {
      return Stack(
        children: [
          if (_isPermissionGranted)
            FutureBuilder<List<CameraDescription>>(
              future: availableCameras(),
              builder: (context, snapshot) {
                if (snapshot.hasData) {
                  _initCameraController(snapshot.data!)
                }
              }
            ),
            Center(child:
              CameraPreview(_cameraController!));
          else {
            return const LinearProgressIndicator();
          }
        ],
      ),
      Scaffold(
        appBar: AppBar(
          backgroundColor:
            Theme.of(context).colorScheme.inversePrimary,
          title: const Text('OCR Road
Signal Recognition'),
          centerTitle: true,
        ),
        backgroundColor:
          _isPermissionGranted ? Colors.transparent : null,
        body: _isPermissionGranted
          ? Column(
            mainAxisAlignment:
              MainAxisAlignment.end,
            children: [
              Container(),
              Container(
                color:
                  Theme.of(context).colorScheme.inversePrimary,
                alignment:
                  Alignment.center,
                child: Padding(
                  padding: const EdgeInsets.symmetric(vertical: 8.0),
                  child: ElevatedButton(
                    onPressed:
                      _scanImage,
                    style: ButtonStyle(
                      minimumSize:
                        WidgetStateProperty.all<Size>(
                          const Size(256,
                            64), // Set the desired width and height
                        ),
                    ),
                    child: const Text('Scan
Traffic sign'),
                  ),
                ),
              ],
            )
          )
          : Center(

```

```

        child: Container(
          padding: const
        EdgeInsets.only(left: 24.0, right: 24.0),
          child: const Text(
            'Camera permission
denied',
            textAlign:
TextAlign.center,
          ),
        ),
      ),
    );
  );
}

Future<void>
_requestCameraPermission() async {
  final status = await
Permission.camera.request();
  _isPermissionGranted = status ==
PermissionStatus.granted;
}

void _startCamera() {
  if (_cameraController != null) {
    _cameraSelected(_cameraController);
  }
}

void _stopCamera() {
  if (_cameraController != null) {
    _cameraController?.dispose();
  }
}

void
_initCameraController(List<CameraDes
cription> cameras) {
  if (_cameraController != null) {
    return;
  }

  // Select the first rear camera.
  CameraDescription? camera;
  for (var i = 0; i < cameras.length; i++) {
    final CameraDescription current =
cameras[i];
    if (current.lensDirection ==
CameraLensDirection.back) {
      camera = current;
      break;
    }
  }

  if (camera != null) {
    _cameraSelected(camera);
  }
}

Future<void>
_cameraSelected(CameraDescription
camera) async {
  _cameraController =
CameraController(
  camera,
  ResolutionPreset.high,
  enableAudio: false,
);
}

Future<void> _scanImage() async {
  if (_cameraController == null)
return;

final navigator =
Navigator.of(context);

try {
  final pictureFile = await
_cameraController.takePicture();

final file = File(pictureFile.path);

final inputImage =
InputImage.fromFile(file);
  final recognizedText = await
textRecognizer.processImage(inputIma
ge);

speak(recognizedText.text);

await navigator.push(
  MaterialPageRoute(
    builder: (BuildContext context)
=>
    ResultScreen(text:
recognizedText.text),
  );
} catch (e) {
  // ignore:
use_build_context_synchronously
}

ScaffoldMessenger.of(context).showSn
ackBar(
  content: Text('An error occurred
when scanning text'),
);
}
}

```

Result :

Thus the program has been verified
Successfully.

Ex No: 8

Facial Recognition

Aim:

develop an application to capture image using camera and displaying the image using Image view.

Procedure:

- * Set up flutter environment flutter doctor
- * Create new flutter project flutter create facial_recognition.
- * Choose a machine learning model TensorFlow Lite.
- * Add dependencies to pubspec.yaml file.
- * Integrate camera to the app
- * Load the model from adjust flutter.
- * Run the inference.

```

Mad 8:
import
'package:face_net_authentication/locator.dart';
import
'package:face_net_authentication/pages/home.dart';
import
'package:flutter/material.dart';
void main() {
setupServices();
runApp(MyApp());
}
class MyApp extends StatelessWidget {
@override
Widget build(BuildContext context) {
return MaterialApp(
theme: ThemeData(
primarySwatch: Colors.blue,
visualDensity:
VisualDensity.adaptivePlatformDensity,
),
home: MyHomePage(),
);
}
}
import
'package:face_net_authentication/locator.dart';
import
'package:face_net_authentication/services/camera.service.dart';
import
'package:camera/camera.dart';
import
'package:flutter/foundation.dart';
import
'package:google_ml_kit/google_ml_kit.dart';
import
'package:flutter/material.dart';

class FaceDetectorService {

```

```

CameraService
_cameraService =
locator<CameraService>();

late FaceDetector
_faceDetector;
FaceDetector get
faceDetector =>
_faceDetector;

List<Face> _faces = [];
List<Face> get faces =>
_faces;
bool get faceDetected =>
_faces.isNotEmpty;

void initialize() {
_faceDetector =
GoogleMLKit.vision.faceDetector(
FaceDetectorOptions(
performanceMode:
FaceDetectorMode.accurate
),
);
}

// _faceDetector =
FaceDetector(
// options:
FaceDetectorOptions(
// performanceMode:
FaceDetectorMode.fast,
// enableContours:
true,
// enableClassification:
true));
}

Future<void>
detectFacesFromImage(Camerimage image) async {
InputImageData
_firebaselImageMetadata =
InputImageData(
imageRotation:
_cameraService.cameraRotation ??
InputImageRotation.rotation0deg,

```

// inputImageFormat:
InputImageFormat.yuv_420_888,

inputImageFormat:
InputImageFormatValue.fromRawValue(image.format.raw)
//
InputImageFormatMethods
fromRawValue(image.format.raw) for new version
??
InputImageFormat.yuv_420_888,
size:
Size(image.width.toDouble(),
image.height.toDouble()),
planeData:
image.planes.map(
(Plane plane) {
return
InputImagePlaneMetadata(
bytesPerRow:
plane.bytesPerRow,
height: plane.height,
width: plane.width,
);
},
).toList(),
);

// for mlkit 13
final WriteBuffer allBytes =
WriteBuffer();
for (final Plane plane in
image.planes) {
allBytes.putUint8List(plane.
bytes);
}
final bytes =
allBytes.done().buffer.asUint8List();

InputImage
_firebaseVisionImage =
InputImage.fromBytes(
// bytes:
image.planes[0].bytes,
bytes: bytes,

```

inputImageData: _firebaseImageMetadata, );
// for mlkit 13

_faces = await
_faceDetector.processImage(_firebaseVisionImage);
}

Future<List<Face>>
detect(Camerimage image,
InputImageRotation rotation) {
final faceDetector =
GoogleMLKit.vision.faceDetector(
FaceDetectorOptions(
performanceMode:
FaceDetectorMode.accurate
,
enableLandmarks: true,
),
);
final WriteBuffer allBytes =
WriteBuffer();
for (final Plane plane in
image.planes) {
allBytes.putUint8List(plane.bytes);
}
final bytes =
allBytes.done().buffer.asUint8List();

final Size imageSize =
Size(image.width.toDouble(),
image.height.toDouble());
final inputImageFormat =
InputImageFormatValue.fromRawValue(image.format.rawValue) ??
InputImageFormat.yuv_420_888;

final planeData =
image.planes.map(
(Plane plane) {
return
InputImagePlaneMetadata(
bytesPerRow:
plane.bytesPerRow,
height: plane.height,
width: plane.width,
);
},
).toList();

final inputImageData =
InputImageData(
size: imageSize,
imageRotation: rotation,
inputImageFormat:
inputImageFormat,
planeData: planeData,
);

return
faceDetector.processImage(
InputImage.fromBytes(bytes,
inputImageData),
);
}

///for new version
// Future<void>
detectFacesFromImage(Camerimage image) async {
// // InputImageData
_firebaseImageMetadata =
InputImageData(
// // imageRotation:
_cameraService.cameraRotation ??
InputImageRotation.rotation0deg,
// // inputImageFormat:
InputImageFormatMethods ?? InputImageFormat.nv21,
// // size:
Size(image.width.toDouble(),
image.height.toDouble()),
// // planeData:
image.planes.map(
// // (Plane plane) {
// // return
InputImagePlaneMetadata(
// // bytesPerRow:
plane.bytesPerRow,
// // height:
plane.height,
// // width: plane.width,
// );
// },
),
).toList();
}

// // height:
plane.height,
// // width:
plane.width,
// );
// ),
// ).toList(),
// );
//
// final WriteBuffer
allBytes = WriteBuffer();
// for (Plane plane in
image.planes) {
//
allBytes.putUint8List(plane.bytes);
//
// final bytes =
allBytes.done().buffer.asUint8List();
//
// final Size imageSize =
Size(image.width.toDouble(),
image.height.toDouble());
//
// InputImageRotation
imageRotation =
_cameraService.cameraRotation ??
InputImageRotation.rotation0deg;
//
// final inputImageData =
InputImageData(
// size: imageSize,
// imageRotation:
imageRotation,
// inputImageFormat:
InputImageFormat.yuv420,
// planeData:
image.planes.map(
// (Plane plane) {
// return
InputImagePlaneMetadata(
// bytesPerRow:
plane.bytesPerRow,
// height:
plane.height,
// width: plane.width,
// );
// },
),
);
}

```

Result :

Thus the program has been verified
Successfully.

Barcode Scanner

AIM :

To develop an android app for barcode scanning
Deep learning based application.

Procedure :

* Run flutter create barcode_scanner app
to create a new flutter project.

* Add required dependencies open pubspec
for google_ml_kit for accessing device's camera
* Set up camera permissions in android manifest XML.

* Initialize Barcode Scanning

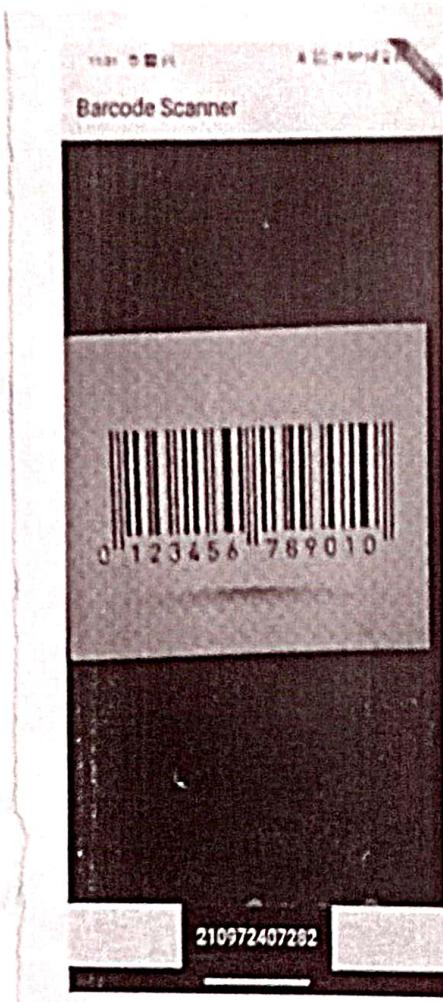
* Capture frames for Barcode detection.

* Process the image and detect Barcodes

* Display scanned barcode data

* Handle user interaction

* Test and Deploy the app.



```

Mad 9
import 'package:flutter/material.dart';
import 'package:mobile_scanner/mobile_scanner.dart';

void main() {
  runApp(const MyApp());
}

class MyApp extends StatelessWidget {
  const MyApp({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Barcode Scanner',
      theme: ThemeData(
        primarySwatch: Colors.blue,
      ),
      home: const
        BarcodeScannerScreen(),
    );
  }
}

class BarcodeScannerScreen extends
StatefulWidget {
  const BarcodeScannerScreen({Key?
key}) : super(key: key);

  @override
  _BarcodeScannerScreenState
createState() =>
  _BarcodeScannerScreenState();
}

class _BarcodeScannerScreenState
extends State<BarcodeScannerScreen>
{
  String barcodeResult = 'Scan a
barcode';

  // Updated function to accept
  BarcodeCapture
  void
  onBarcodeDetected(BarcodeCapture
capture) {
    final barcode =
capture.barcodes.first;
    setState(() {
      barcodeResult = barcode.rawValue
?? 'Unknown Barcode';
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text('Barcode
Scanner'),
      ),
      body: Column(
        children: [
          Expanded(
            child: MobileScanner(
              onDetect: onBarcodeDetected,
              // Use onBarcodeDetected directly
            ),
          ),
        ],
      ),
    );
  }
}

```

Result :

*thus the program has been runned
successfully.*