

Software for Mobile Devices

Final Project

Name: Huraira Muzammal

Section: BCS 5B

Roll number: 22F-3853

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Submitted to: Mam Saba Ghani

Project Code:

Main activity

```
package com.example.semester_project;

import android.content.Intent;
import android.graphics.Matrix;
import android.graphics.SurfaceTexture;
import android.media.MediaPlayer;
import android.net.Uri;
import android.os.Bundle;
import android.view.Surface;
import android.view.TextureView;
import android.widget.Button;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private TextureView backgroundTextureView;
    private MediaPlayer mediaPlayer;

    Button buttonModel1, buttonModel2, buttonModel3, buttonModel4;

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

        // Buttons
        buttonModel1 = findViewById(R.id.buttonModel1);
        buttonModel2 = findViewById(R.id.buttonModel2);

        // TextureView for video background
        backgroundTextureView = findViewById(R.id.textureView);
```

```
backgroundTextureView.setSurfaceTextureListener(new
TextureView.SurfaceTextureListener() {
    @Override
    public void onSurfaceTextureAvailable(SurfaceTexture surfaceTexture, int width, int
height) {
        playVideo(new Surface(surfaceTexture));
    }

    @Override
    public void onSurfaceTextureSizeChanged(SurfaceTexture surface, int width, int
height) {}
    @Override
    public boolean onSurfaceTextureDestroyed(SurfaceTexture surface) { return true; }
    @Override
    public void onSurfaceTextureUpdated(SurfaceTexture surface) {}
});

// Button click
buttonModel1.setOnClickListener(v -> {
    Intent intent = new Intent(MainActivity.this, text_recognition.class);
    startActivity(intent);
});

buttonModel2.setOnClickListener(v -> {
    Intent intent = new Intent(MainActivity.this, qr_scanner.class);
    startActivity(intent);
});

}

private void playVideo(Surface surface) {
    mediaPlayer = MediaPlayer.create(this, Uri.parse("android.resource://" +
getPackageName() + "/" + R.raw.background));
    mediaPlayer.setSurface(surface);
    mediaPlayer.setLooping(true);
    mediaPlayer.setVolume(0f, 0f); // mute
```

```
mediaPlayer.setOnVideoSizeChangedListener((mp, videoWidth, videoHeight) -> {
    float scaleX = (float) backgroundTextureView.getWidth() / videoWidth;
    float scaleY = (float) backgroundTextureView.getHeight() / videoHeight;

    float scale = Math.max(scaleX, scaleY); // stretch to fill
    float scaledWidth = scale * videoWidth;
    float scaledHeight = scale * videoHeight;
    float dx = (backgroundTextureView.getWidth() - scaledWidth) / 2;
    float dy = (backgroundTextureView.getHeight() - scaledHeight) / 2;

    Matrix matrix = new Matrix();
    matrix.setScale(scale, scale);
    matrix.postTranslate(dx, dy);
    backgroundTextureView.setTransform(matrix);
});

mediaPlayer.start();
}

@Override
protected void onPause() {
    super.onPause();
    if (mediaPlayer != null && mediaPlayer.isPlaying()) {
        mediaPlayer.pause();
    }
}

@Override
protected void onResume() {
    super.onResume();
    if (mediaPlayer != null) {
        mediaPlayer.start();
    }
}

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

```
        if (mediaPlayer != null) {
            mediaPlayer.release();
            mediaPlayer = null;
        }
    }
}

textrecognition.java

package com.example.semester_project;

import static android.view.View.VISIBLE;

import android.content.Intent;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.Matrix;
import android.media.ExifInterface;
import android.net.Uri;
import android.os.Bundle;
import android.os.Environment;
import android.provider.MediaStore;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;

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

import com.google.mlkit.vision.common.InputImage;
import com.google.mlkit.vision.text.TextRecognition;
import com.google.mlkit.vision.text.TextRecognizer;
import com.google.mlkit.vision.text.latin.TextRecognizerOptions;
```

```
import java.io.File;
import java.io.IOException;
import java.text.SimpleDateFormat;
import java.util.Locale;

public class text_recognition extends AppCompatActivity {

    ImageView imageView;
    Button capturebutton;
    Bitmap finalBitmap;
    TextView textView;
    Button button2;

    private static final int REQUEST_IMAGE_CAPTURE = 1;

    String currentPhotoPath = null;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_text_recognition);
        imageView = findViewById(R.id.cameraImage);
        capturebutton = findViewById(R.id.captureImage);
        textView = findViewById(R.id.resultText);
        button2 = findViewById(R.id.copyTextBtn);

        capturebutton.setOnClickListener(v -> {
            captureImage(); // call function
        });

    }

    private File createImageFile() throws IOException {
        String timestamp = String.valueOf(new SimpleDateFormat("yyyyMMdd_HHmmss",
        Locale.getDefault()));
    }
}
```

```

        File storageDir = getExternalFilesDir(Environment.DIRECTORY_PICTURES);
        return File.createTempFile("JPEG_${timestamp}_" + timestamp + "_", "jpg",
storageDir).getAbsoluteFile();

    }

private void captureImage() {
    Intent takePictureIntent = new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
    if (takePictureIntent.resolveActivity(getPackageManager()) != null) {
        File photoFile = null;
        try {
            photoFile = createImageFile();
        } catch (IOException ex) {
            ex.printStackTrace();
        }
        if (photoFile != null) {
            currentPhotoPath = photoFile.getAbsolutePath();
            Uri photoURI = FileProvider.getUriForFile(this,
"com.example.semester_project.fileprovider", photoFile);
            takePictureIntent.putExtra(MediaStore.EXTRA_OUTPUT, photoURI);
            startActivityForResult(takePictureIntent, REQUEST_IMAGE_CAPTURE);
        }
    }
}

private Bitmap rotateBitmap(Bitmap bitmap, int orientation) {
    Matrix matrix = new Matrix();
    switch (orientation) {
        case ExifInterface.ORIENTATION_ROTATE_90:
            matrix.postRotate(90);
            break;
        case ExifInterface.ORIENTATION_ROTATE_180:
            matrix.postRotate(180);
            break;
    }
}

```

```

        case ExifInterface.ORIENTATION_ROTATE_270:
            matrix.postRotate(270);
            break;
        default:
            return bitmap; // no rotation needed
    }
    return Bitmap.createBitmap(bitmap, 0, 0, bitmap.getWidth(), bitmap.getHeight(),
matrix, true);
}

@Override
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    super.onActivityResult(requestCode, resultCode, data);

    if (requestCode == REQUEST_IMAGE_CAPTURE && resultCode == RESULT_OK) {
        Bitmap bitmap = BitmapFactory.decodeFile(currentPhotoPath);

        try {
            ExifInterface exif = new ExifInterface(currentPhotoPath);
            int orientation = exif.getAttributeInt(ExifInterface.TAG_ORIENTATION,
ExifInterface.ORIENTATION_NORMAL);
            Bitmap rotatedBitmap = rotateBitmap(bitmap, orientation);
            imageView.setImageBitmap(rotatedBitmap);
            finalBitmap = rotatedBitmap;
            recognizeText(rotatedBitmap);

        } catch (IOException e) {
            e.printStackTrace();
            textView.setText("Error loading image!");
        }
    }
}

private void recognizeText(Bitmap bitmap) {

    InputImage image = InputImage.fromBitmap(bitmap, 0);

```

```

        TextRecognizer recognizer =
TextRecognition.getClient(TextRecognizerOptions.DEFAULT_OPTIONS);
        recognizer.process(image)
            .addOnSuccessListener(visionText -> {
                textView.setText(visionText.getText());
                button2.setVisibility(VISIBLE); // Show copy button
            })
            .addOnFailureListener(e -> {
                textView.setText("OCR failed!");
            });
    }

//      button2 is copy button pressing on that copy the text to clipboard
button2.setOnClickListener(v -> {
    String text = textView.getText().toString();
    if (!text.isEmpty()) {
        android.content.ClipboardManager clipboard =
(android.content.ClipboardManager) getSystemService(CLIPBOARD_SERVICE);
        android.content.ClipData clip = android.content.ClipData.newPlainText("OCR
Text", text);
        clipboard.setPrimaryClip(clip);
        Toast.makeText(text_recognition.this, "Text copied to clipboard ✅",
Toast.LENGTH_SHORT).show();
    } else {
        Toast.makeText(text_recognition.this, "No text to copy ⚠️",
Toast.LENGTH_SHORT).show();
    }
});
}

}

```

web_activity.java

```
package com.example.semester_project;
```

```
import android.content.Intent;
```

```
import android.os.Bundle;
import android.webkit.WebView;
import android.webkit.WebViewClient;

import androidx.appcompat.app.AppCompatActivity;

public class web_activity extends AppCompatActivity{
    private WebView webView;

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

        webView = findViewById(R.id.webView);
        webView.setWebViewClient(new WebViewClient());

        Intent intent = getIntent();
        String url = intent.getStringExtra("url");
        if (url != null && !url.isEmpty()) {
            webView.loadUrl(url);
        } else {
            webView.loadUrl("https://www.google.com");
        }
    }

    @Override
    public void onBackPressed() {
        if (webView.canGoBack()) {
            webView.goBack();
        } else {
            super.onBackPressed();
        }
    }
}
```

XML Codes:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/mainLayout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!-- TextureView for background video -->
    <TextureView
        android:id="@+id/textureView"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

    <!-- Foreground UI on top of video -->
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center_horizontal"
        android:orientation="vertical"
        android:padding="24dp">

        <!-- Heading centered -->
        <TextView
            android:id="@+id/titleText"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="50dp"
            android:layout_marginBottom="224dp"
            android:fontFamily="monospace"
            android:gravity="center"
            android:text="Firebase ML Kit"
            android:textAlignment="center"
```

```
        android:textColor="@android:color/white"
        android:textSize="30dp"
        android:textStyle="bold" />

    <!-- Row 1-->
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_marginBottom="12dp"
        android:orientation="horizontal">

        <Button
            android:id="@+id/buttonModel1"
            android:layout_width="0dp"
            android:layout_height="80dp"
            android:layout_marginEnd="6dp"
            android:layout_weight="1"
            android:background="@drawable/rounded_button"
            android:elevation="4dp"
            android:fontFamily="sans-serif-medium"
            android:text="Module 1: Text Extractor"
            android:textColor="@android:color/white" />

    </LinearLayout>
    <!-- Row 1-->
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_marginBottom="12dp"
        android:orientation="horizontal">

        <Button
            android:id="@+id/buttonModel2"
            android:layout_width="0dp"
            android:layout_height="80dp"
            android:layout_marginStart="6dp"
            android:layout_weight="1"
```

```
        android:fontFamily="sans-serif-medium"
        android:background="@drawable/rounded_button"
        android:elevation="4dp"
        android:text="Model 2: QR Scanner"
        android:textColor="@android:color/white" />

    </LinearLayout>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="100dp">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:paddingStart="50dp"
            android:textSize="18dp"
            android:fontFamily="casual"
            android:textColor="@color/white"
            android:gravity="center_horizontal"
            android:text="SMD Project by Abu Huraria" />
    
```

Activity_qr_scanner.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
```

```
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:context=".qr_scanner">

    <!-- Camera Preview -->
    <androidx.camera.view.PreviewView
        android:id="@+id/preview"
        android:layout_width="0dp"
        android:layout_height="0dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toTopOf="@+id/resultTextView"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginBottom="8dp" />

    <!-- QR Code Result -->
    <TextView
        android:id="@+id/resultTextView"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:padding="16dp"
        android:gravity="center"
        android:textSize="18sp"
        android:text="Scan result will appear here"
        android:textColor="@android:color/holo_blue_dark"
        android:clickable="true"
        android:focusable="true"
        app:layout_constraintTop_toBottomOf="@+id/preview"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

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

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

<ImageView
    android:layout_width="match_parent"
    android:layout_height="200dp"
    android:id="@+id/cameralmage"

    android:src="@drawable/baseline_image_24"
    android:layout_marginTop="12dp"/>

<Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/captureImage"
    android:text="Capture view"
    android:backgroundTint="@color/green"
    android:layout_marginTop="12dp"

    />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="OCR Text"
    android:textSize="26sp"
    android:textStyle="bold"
    android:textColor="@color/black"
    android:layout_margin="16dp"/>

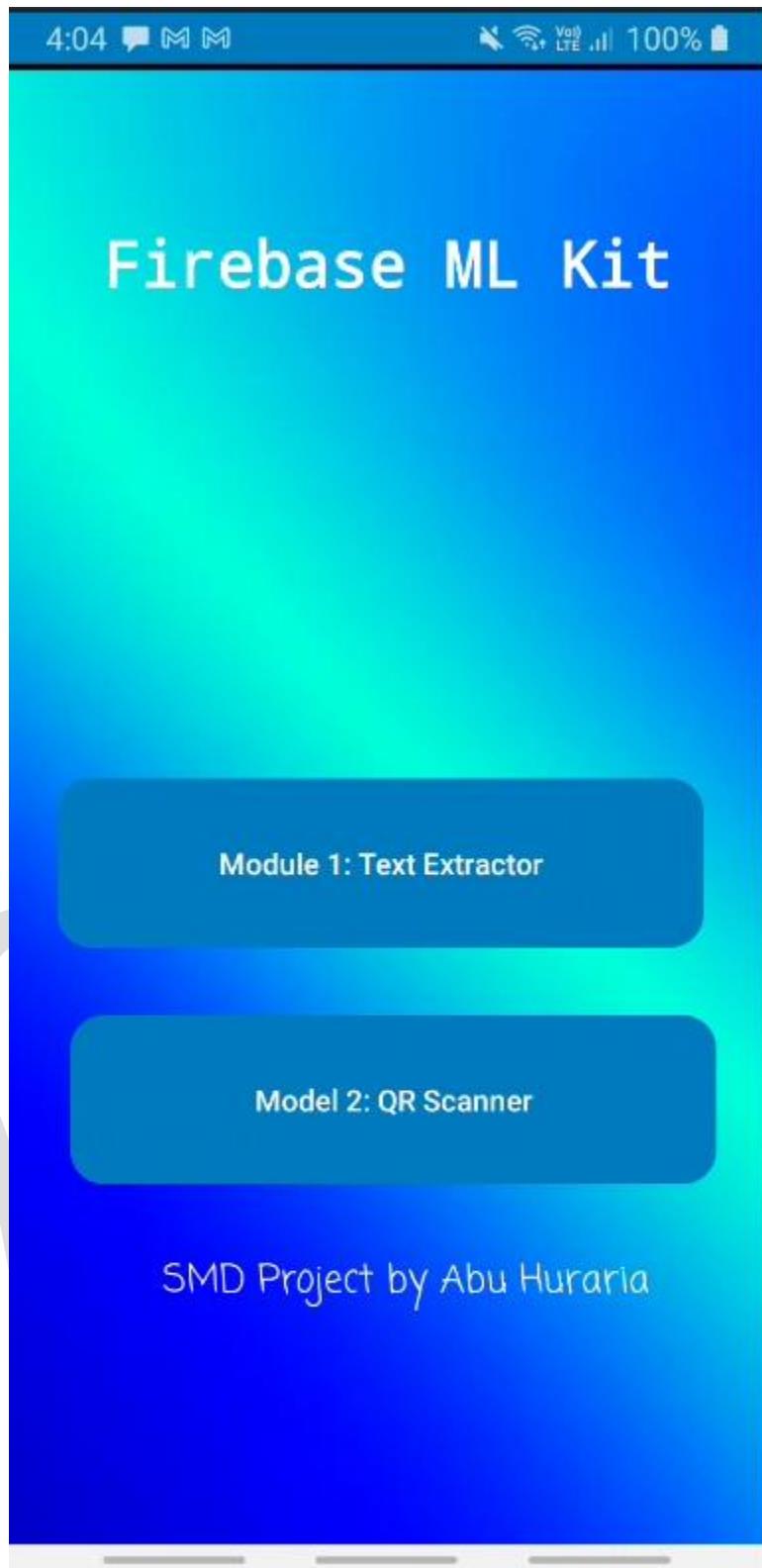
<ScrollView
    android:layout_width="match_parent"
    android:layout_height="280dp"
```

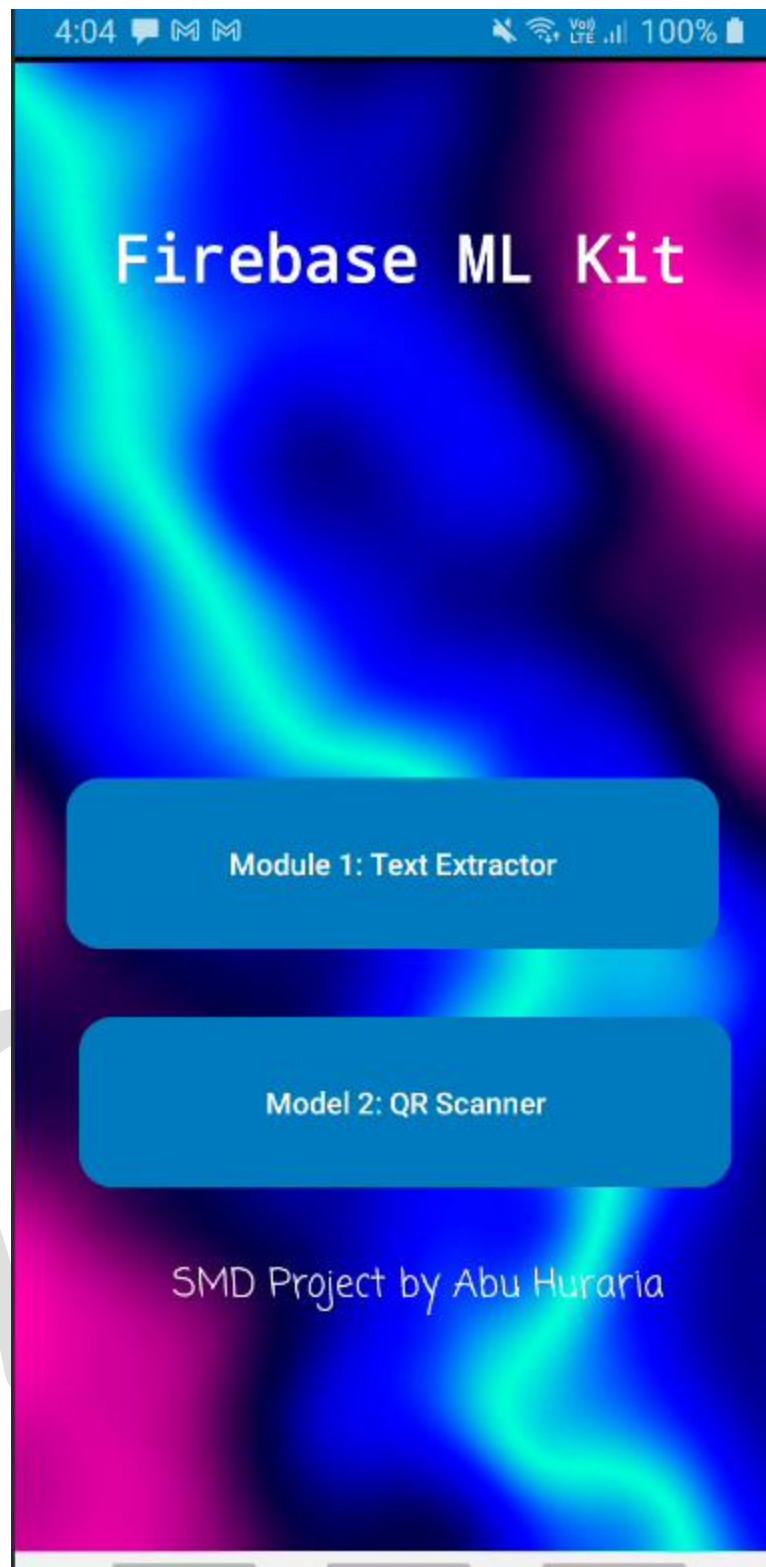
```
    android:layout_marginTop="16dp"
    android:background="@drawable/border">

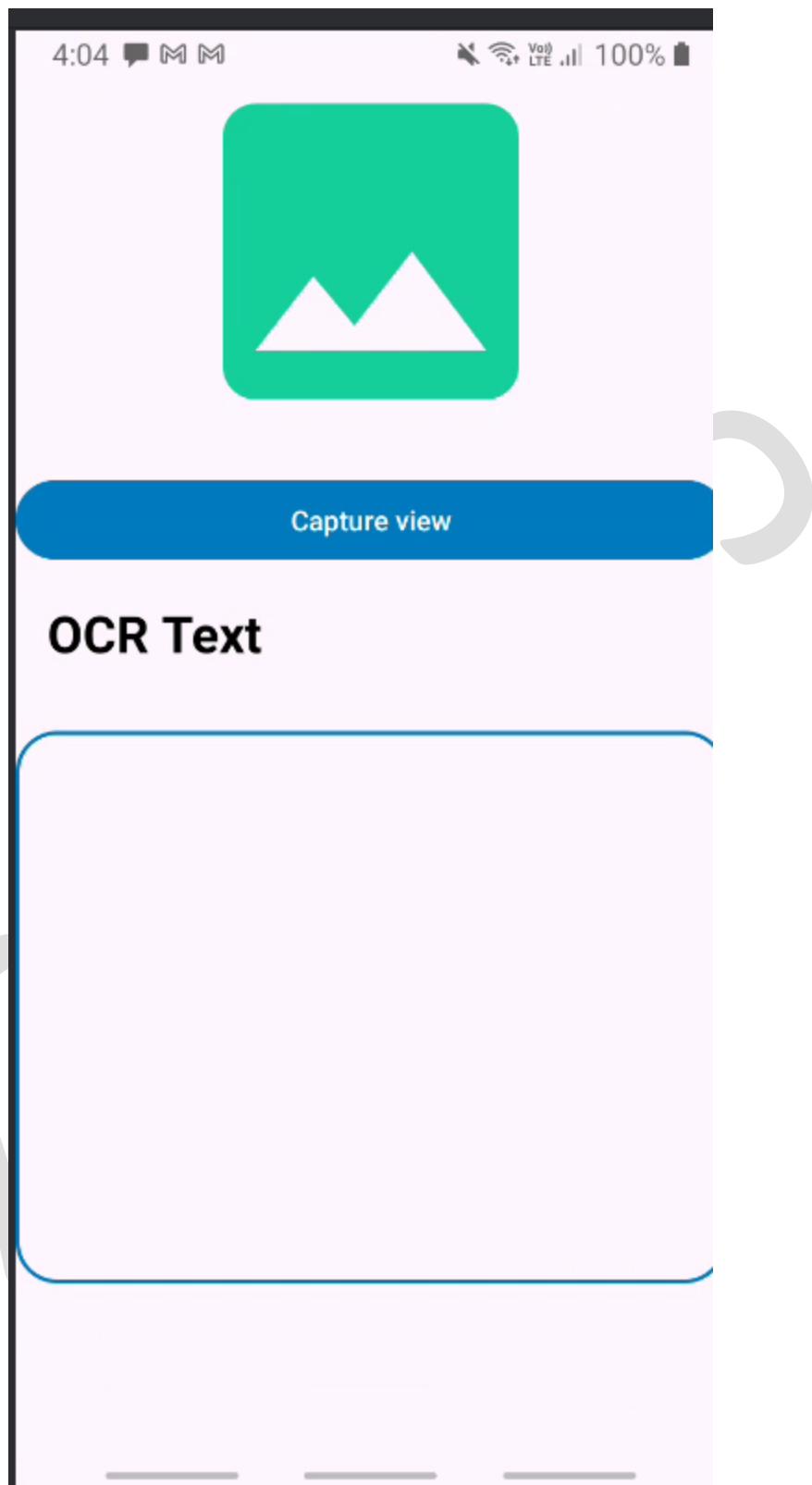
    <TextView
        android:id="@+id/resultText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:padding="8dp"
        android:textColor="@color/black"
        android:textSize="20sp"
        android:textAlignment="textStart"
        android:scrollbars="vertical" />
</ScrollView>
```

```
<Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/copyTextBtn"
    android:text="Copy Text"
    android:visibility="invisible"
    android:backgroundTint="@color/green"
    android:layout_marginTop="12dp"/>
</LinearLayout>
```

Outputs:





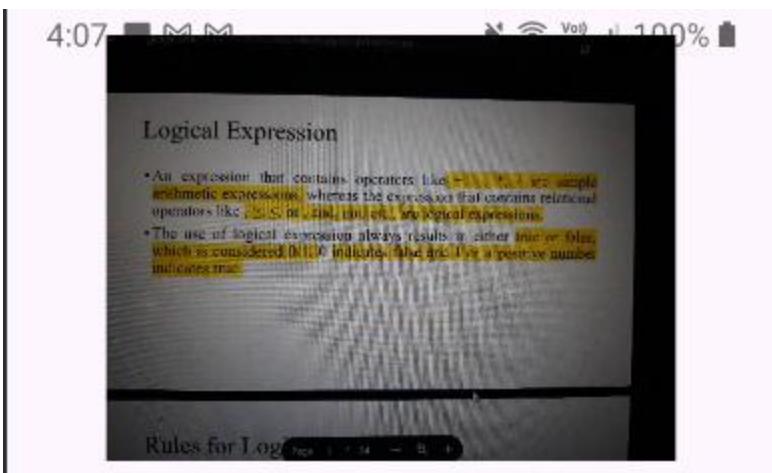


Logical Expression

- An expression that contains operators like `! , ~ , * , /` are simple arithmetic expressions, whereas the expression that contains relational operators like `>= , <= , or , and , not , etc.` are logical expressions,
- The use of logical expression always results in either true or false which is considered 0/1. 0 indicates false and 1 or a positive number indicates true.

Retry

OK



OCR Text

Chye google.com le/dxE09CStq
38X5ZIWkwFLqqj40sgVTS4Gn/
view

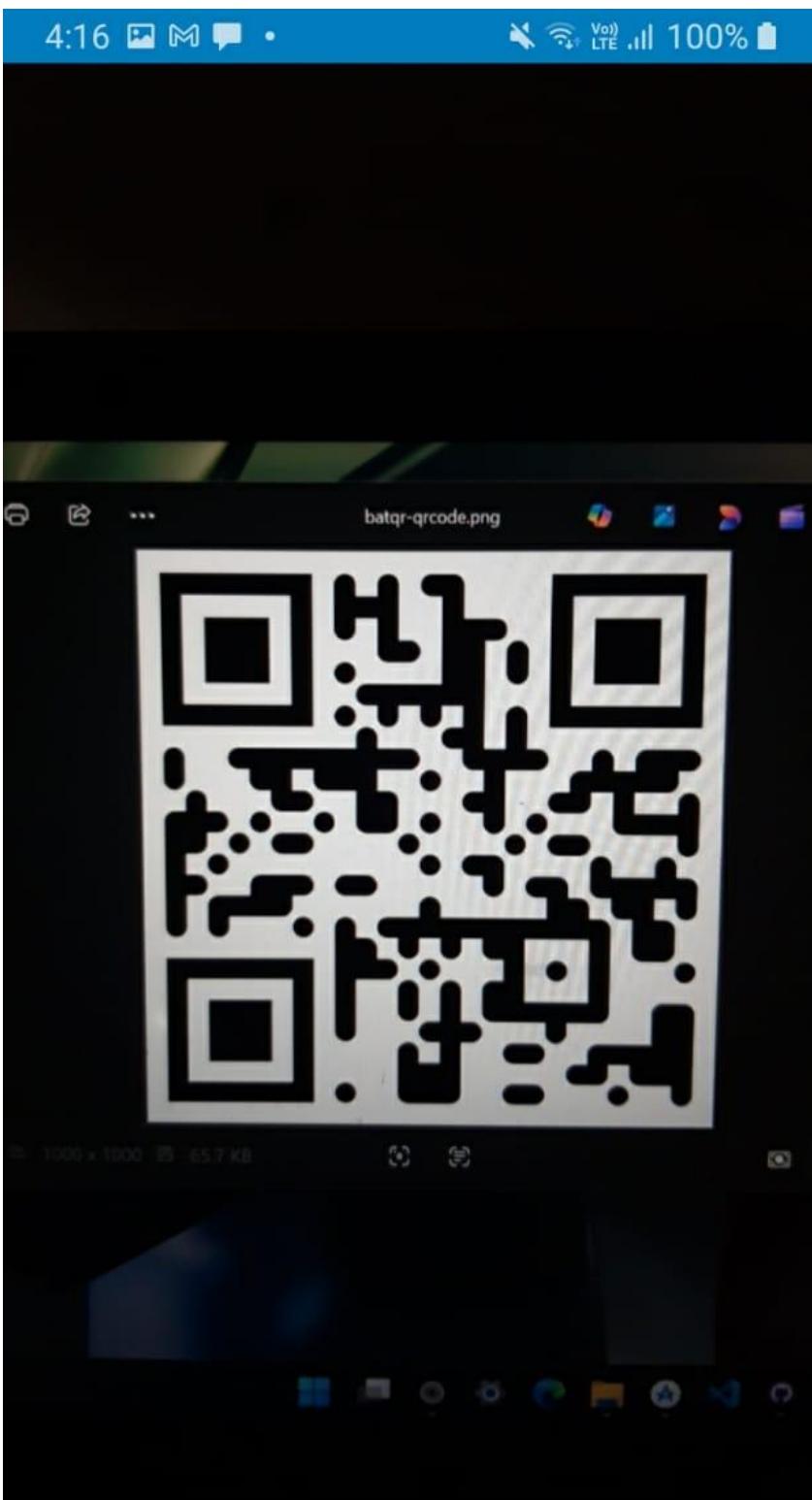
Logical Expression

- An expression that contains operators like +, / are simple arithmetic expressions, whereas the expression that contains relational operators like =, <, >, or, and, not, etc., are logical expressions.
- The use of logical expression always

Copy Text

Module 2 QR Scanning

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