**Software for Mobile Devices**

**Final Project**

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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" />  
 </LinearLayout>  
 </LinearLayout>  
</FrameLayout>

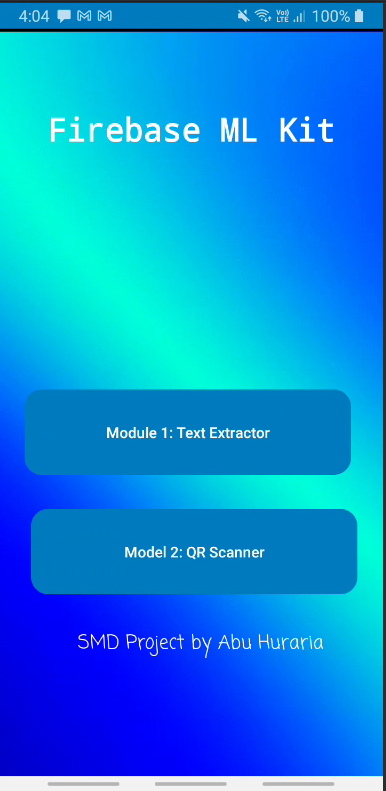
Activity\_qr\_scanner.xml

<?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/cameraImage"  
  
 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:



A screenshot of a phone

AI-generated content may be incorrect.

A screenshot of a phone

AI-generated content may be incorrect.

A screen shot of a computer

AI-generated content may be incorrect.

A screenshot of a phone

AI-generated content may be incorrect.

Module 2 QR Scanning

A screen shot of a qr code

AI-generated content may be incorrect.

A screen shot of a phone

AI-generated content may be incorrect.

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