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CH.EN.U4CYS21041  
  
  
 20CYS404 -Android Application Development**

**END SEM LAB EXAM DOCUMENT**

**Experiment 8**

**1. Create an Amrita App for Computer Vision**

**2. Create 6 tiles with different vision applications. Like currency convertor or number plate detection. Etc.**

**3. Integrate Google Lens API in it.**

**4. Test a few images**

***Activity\_main.xml***  
<?xml version="1.0" encoding="utf-8"?>  
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:padding="16dp"  
 android:background="@drawable/gradient\_background">  
  
 <ImageView  
 android:id="@+id/logoImageView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="100dp"  
 android:layout\_marginBottom="16dp"  
 android:src="@drawable/amrita\_logo"  
 android:scaleType="centerInside" />  
  
 <TextView  
 android:id="@+id/titleTextView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Computer Vision App"  
 android:textSize="24sp"  
 android:textStyle="bold"  
 android:layout\_centerHorizontal="true"  
 android:layout\_below="@id/logoImageView"  
 android:layout\_marginTop="10dp"  
 android:textColor="#FFDDDDFF" />  
  
 <TextView  
 android:id="@+id/nameTextView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Sai Mahesh"  
 android:textSize="20sp"  
 android:textColor="#FFDDDDFF"  
 android:layout\_below="@id/titleTextView"  
 android:layout\_centerHorizontal="true"  
 android:layout\_marginTop="5dp" />  
  
 <androidx.cardview.widget.CardView  
 android:id="@+id/card\_currency"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_below="@id/nameTextView"  
 android:layout\_marginTop="20dp"  
 app:cardBackgroundColor="#FFBBDEFB"  
 app:cardCornerRadius="12dp"  
 app:cardElevation="4dp">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical"  
 android:padding="16dp"  
 android:gravity="center">  
  
 <ImageView  
 android:id="@+id/currencyIcon"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:src="@drawable/ic\_money"  
 android:layout\_marginBottom="8dp" />  
  
 <TextView  
 android:id="@+id/currencyConverterText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Currency Converter"  
 android:textSize="18sp"  
 android:textColor="#FF004D40" />  
 </LinearLayout>  
 </androidx.cardview.widget.CardView>  
  
 <androidx.cardview.widget.CardView  
 android:id="@+id/card\_number\_plate"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_below="@id/card\_currency"  
 android:layout\_marginTop="20dp"  
 app:cardBackgroundColor="#FFBBDEFB"  
 app:cardCornerRadius="12dp"  
 app:cardElevation="4dp">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical"  
 android:padding="16dp"  
 android:gravity="center">  
  
 <ImageView  
 android:id="@+id/numberPlateIcon"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:src="@drawable/ic\_camera"  
 android:layout\_marginBottom="8dp" />  
  
 <TextView  
 android:id="@+id/numberPlateDetectionText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Number Plate Detection"  
 android:textSize="18sp"  
 android:textColor="#FF004D40" />  
 </LinearLayout>  
 </androidx.cardview.widget.CardView>  
  
</RelativeLayout>  
  
***activity\_number\_plate.xml***  
<?xml version="1.0" encoding="utf-8"?>  
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:padding="16dp"  
 android:background="@drawable/gradient\_background">  
  
 <ImageView  
 android:id="@+id/logoImageView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="100dp"  
 android:layout\_marginBottom="16dp"  
 android:src="@drawable/amrita\_logo"  
 android:scaleType="centerInside" />  
  
 <TextView  
 android:id="@+id/titleTextView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Computer Vision App"  
 android:textSize="24sp"  
 android:textStyle="bold"  
 android:layout\_centerHorizontal="true"  
 android:layout\_below="@id/logoImageView"  
 android:layout\_marginTop="10dp"  
 android:textColor="#FFDDDDFF" />  
  
 <TextView  
 android:id="@+id/nameTextView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Satwika-21041"  
 android:textSize="20sp"  
 android:textColor="#FFDDDDFF"  
 android:layout\_below="@id/titleTextView"  
 android:layout\_centerHorizontal="true"  
 android:layout\_marginTop="5dp" />  
  
 <androidx.cardview.widget.CardView  
 android:id="@+id/card\_currency"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_below="@id/nameTextView"  
 android:layout\_marginTop="20dp"  
 app:cardBackgroundColor="#FFBBDEFB"  
 app:cardCornerRadius="12dp"  
 app:cardElevation="8dp">  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical"  
 android:padding="16dp"  
 android:gravity="center">  
  
 <ImageView  
 android:id="@+id/currencyIcon"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:src="@drawable/ic\_money"  
 android:layout\_marginBottom="8dp" />  
  
 <TextView  
 android:id="@+id/currencyConverterText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Currency Converter"  
 android:textSize="20sp"  
 android:textColor="#FF004D40" />  
 </LinearLayout>  
 </androidx.cardview.widget.CardView>  
  
 <androidx.cardview.widget.CardView  
 android:id="@+id/card\_number\_plate"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_below="@id/card\_currency"  
 android:layout\_marginTop="20dp"  
 app:cardBackgroundColor="#FFBBDEFB"  
 app:cardCornerRadius="12dp"  
 app:cardElevation="8dp">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical"  
 android:padding="16dp"  
 android:gravity="center">  
  
 <ImageView  
 android:id="@+id/numberPlateIcon"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:src="@drawable/ic\_camera"  
 android:layout\_marginBottom="8dp" />  
  
 <TextView  
 android:id="@+id/numberPlateDetectionText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Number Plate Detection"  
 android:textSize="20sp"  
 android:textColor="#FF004D40" />  
 </LinearLayout>  
 </androidx.cardview.widget.CardView>  
  
</RelativeLayout>

***number\_plate\_detection.java***  
package com.example.computervision;  
  
import android.annotation.SuppressLint;  
import android.content.Intent;  
import android.net.Uri;  
import android.os.Bundle;  
import android.provider.MediaStore;  
import android.widget.ImageView;  
import android.widget.TextView;  
import android.widget.Toast;  
  
import androidx.annotation.Nullable;  
import androidx.appcompat.app.AppCompatActivity;  
  
import com.google.android.gms.tasks.OnFailureListener;  
import com.google.android.gms.tasks.OnSuccessListener;  
import com.google.mlkit.vision.common.InputImage;  
import com.google.mlkit.vision.text.Text;  
import com.google.mlkit.vision.text.TextRecognition;  
import com.google.mlkit.vision.text.TextRecognizer;  
import com.google.mlkit.vision.text.latin.TextRecognizerOptions;  
  
public class NumberPlateDetectionActivity extends AppCompatActivity {  
  
 private static final int *PICK\_IMAGE\_REQUEST* = 1; // Request code for selecting an image  
  
 private ImageView imageView = findViewById(R.id.*numberPlateIcon*);  
 private TextView resultTextView;  
 private Uri imageUri; // To store selected image URI  
  
 @SuppressLint("MissingInflatedId")  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_number\_plate\_detection*);  
  
 resultTextView = findViewById(R.id.*resultTextView*);  
  
 // Trigger image selection  
 selectImageFromGallery();  
 }  
  
 // Method to open the image gallery  
 private void selectImageFromGallery() {  
 Intent intent = new Intent(Intent.*ACTION\_PICK*, MediaStore.Images.Media.*EXTERNAL\_CONTENT\_URI*);  
 startActivityForResult(intent, *PICK\_IMAGE\_REQUEST*); // Start the gallery intent  
 }  
  
 // Handle the result when the user picks an image  
 @Override  
 protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {  
 super.onActivityResult(requestCode, resultCode, data);  
  
 if (requestCode == *PICK\_IMAGE\_REQUEST* && resultCode == *RESULT\_OK* && data != null && data.getData() != null) {  
 imageUri = data.getData(); // Get the URI of the selected image  
 imageView.setImageURI(imageUri); // Display the image in the ImageView  
 processImage(imageUri); // Process the image for text recognition  
 } else {  
 Toast.*makeText*(this, "No image selected", Toast.*LENGTH\_SHORT*).show();  
 }  
 }  
  
 // Method to process the selected image  
 private void processImage(Uri imageUri) {  
 try {  
 InputImage image = InputImage.*fromFilePath*(this, imageUri);  
 TextRecognizer recognizer = TextRecognition.*getClient*(TextRecognizerOptions.*DEFAULT\_OPTIONS*);  
  
 recognizer.process(image)  
 .addOnSuccessListener(new OnSuccessListener<Text>() {  
 @Override  
 public void onSuccess(Text result) {  
 String recognizedText = result.getText();  
 resultTextView.setText("Detected text: " + recognizedText);  
 }  
 })  
 .addOnFailureListener(new OnFailureListener() {  
 @Override  
 public void onFailure(Exception e) {  
 Toast.*makeText*(NumberPlateDetectionActivity.this, "Error: " + e.getMessage(), Toast.*LENGTH\_SHORT*).show();  
 }  
 });  
 } catch (Exception e) {  
 Toast.*makeText*(this, "Error processing image: " + e.getMessage(), Toast.*LENGTH\_SHORT*).show();  
 }  
 }  
}

***Andriodmanifest.xml***

<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 package="com.example.computervision">  
 <uses-permission android:name="android.permission.READ\_EXTERNAL\_STORAGE" />  
  
 <application  
 android:allowBackup="true"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/Theme.AppCompat.Light.NoActionBar">  
  
 <activity  
 android:name=".MainActivity"  
 android:exported="true"> <!-- Set to true for launcher activity -->  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
  
 <activity  
 android:name=".NumberPlateDetectionActivity"  
 android:exported="false"> <!-- Set to false if not exported -->  
 </activity>  
  
 <activity  
 android:name=".CurrencyConverterActivity"  
 android:exported="false"> <!-- Set to false if not exported -->  
 </activity>  
  
 <!-- Add other activities as needed -->  
  
 </application>  
  
</manifest>

***Mainactivity.java***

package com.example.computervision;  
  
import android.content.Intent;  
import android.net.Uri;  
import android.os.Bundle;  
import android.provider.MediaStore;  
import android.view.View;  
  
import android.widget.ImageView;  
import android.widget.Toast;  
  
import androidx.annotation.Nullable;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.cardview.widget.CardView;  
  
public class MainActivity extends AppCompatActivity {  
  
 private static final int *IMAGE\_PICK\_CODE* = 1000;  
 private static final int *CURRENCY\_CONVERTER\_REQUEST* = 1;  
 private static final int *NUMBER\_PLATE\_DETECTION\_REQUEST* = 2;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 CardView cardCurrency = findViewById(R.id.*card\_currency*);  
 CardView cardNumberPlate = findViewById(R.id.*card\_number\_plate*);  
  
 cardCurrency.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 // Start CurrencyConverterActivity  
 Intent intent = new Intent(MainActivity.this, CurrencyConverterActivity.class);  
 startActivityForResult(intent, *CURRENCY\_CONVERTER\_REQUEST*);  
 }  
 });  
  
 cardNumberPlate.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 // Start NumberPlateDetectionActivity  
 Intent intent = new Intent(MainActivity.this, NumberPlateDetectionActivity.class);  
 startActivityForResult(intent, *NUMBER\_PLATE\_DETECTION\_REQUEST*);  
 }  
 });  
 }  
  
 @Override  
 protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {  
 super.onActivityResult(requestCode, resultCode, data);  
 if (resultCode == *RESULT\_OK* && data != null) {  
 Uri imageUri = data.getData();  
 if (requestCode == *CURRENCY\_CONVERTER\_REQUEST*) {  
 // Handle currency converter logic  
 } else if (requestCode == *NUMBER\_PLATE\_DETECTION\_REQUEST*) {  
 // Start the number plate detection activity with the selected image  
 Intent intent = new Intent(MainActivity.this, NumberPlateDetectionActivity.class);  
 intent.putExtra("imageUri", imageUri.toString());  
 startActivity(intent);  
 }  
 }  
 }  
}

***outputs:***





