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Exercise 7 – Writing To and Reading From the SD Card

Aim:

Develop an android application to read the text from the SD Card and Write into the SD Card. To perform this, create two TextViews one for writing the text and save the text into the SD Card once submit button is clicked and another one for Displaying the text that is retrieved from the SD Card.

Code:

```
//activity_main.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_width="match_parent"
    android:layout_height="match_parent"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    tools:context=".MainActivity">
<TextView
android:id="@+id/title"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="SD Card App"
android:textAppearance="@style/TextAppearance.AppCompat.Display1"
android:textColor="#007565"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintHorizontal_bias="0.497"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.064" />
<TextView
android:id="@+id/textView"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="36dp"
android:layout_marginEnd="108dp"
android:text="Write contents into a file"
android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textColor="#00BFA5"
```

```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/title" />
<TextView
android:id="@+id/textView2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="80dp"
android:layout_marginEnd="152dp"
android:text="File contents:"
android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textColor="#304FFE"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/title" />
<TextView
android:id="@+id/textView3"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="180dp"
android:layout_marginEnd="256dp"
android:text="File Name:"
android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textColor="#304FFE"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/title" />
<EditText
android:id="@+id/content"
android:layout_width="326dp"
android:layout_height="44dp"
android:layout_marginTop="16dp"
android:layout_marginEnd="40dp"
android:ems="10"
android:gravity="start|top"
android:inputType="textMultiLine"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView2" />
<EditText
android:id="@+id/filename"
android:layout_width="163dp"
android:layout_height="38dp"
android:layout_marginTop="76dp"
android:layout_marginEnd="60dp"
android:ems="10"
android:gravity="start|top"
android:inputType="textMultiLine"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView2" />
<Button
```

```
android:id="@+id/writebtn"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="32dp"
android:layout_marginEnd="156dp"
android:backgroundTint="#00BFA5"
android:text="Write File"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/filename" />
<Button
android:id="@+id/btnLoad"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="152dp"
android:layout_marginEnd="136dp"
android:backgroundTint="#00BFA5"
android:text="Load From File"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/filename" />
</androidx.constraintlayout.widget.ConstraintLayout>


//activity_read_file.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:layout_width="match_parent" android:layout_height="match_parent"
tools:context=".ReadFile">
    <EditText
        android:id="@+id/filename2" android:layout_width="163dp"
android:layout_height="38dp" android:layout_marginTop="28dp"
android:layout_marginEnd="52dp" android:ems="10" android:gravity="start|top"
android:inputType="textMultiLine" app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView6" />
    <TextView
        android:id="@+id/textView4" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_marginTop="40dp"
android:layout_marginEnd="152dp" android:text="File contents:"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textColor="#304FFE" app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/loadbtn" />
    <TextView
        android:id="@+id/title2" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_marginTop="44dp"
```

```
android:layout_marginEnd="108dp" android:text="SD Card App"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
android:textColor="#007565" app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toTopOf="parent" />
    <TextView
        android:id="@+id/textView5" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_marginStart="100dp"

        android:layout_marginTop="28dp"
        android:text="File Name:"
android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textColor="#304FFE" app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView6" />
    <Button
        android:id="@+id/loadbtn" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_marginTop="36dp"
android:layout_marginEnd="148dp" android:backgroundTint="#00BFA5"
android:text="LOAD FILE" app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/filename2" />
    <TextView
        android:id="@+id/textView6" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:layout_marginTop="20dp"
android:layout_marginEnd="104dp" android:text="Read contents From File"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
android:textColor="#00BFA5" app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/title2" />
    <TextView
        android:id="@+id/tvLoad" android:layout_width="283dp"
android:layout_height="116dp" android:layout_marginTop="32dp"
android:layout_marginEnd="52dp"
        android:textAppearance="@style/TextAppearance.AppCompat.Body1"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView4" />
</androidx.constraintlayout.widget.ConstraintLayout>


//MainActivity.java

package com.example.ex7;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import android.content.DialogInterface;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Bundle;
import android.os.Environment;
```

```
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import java.io.BufferedReader;
import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.io.FileReader;
import java.io.IOException;
import java.io.OutputStreamWriter;
public class MainActivity extends AppCompatActivity {
    // Declare the View object references
    Button btnSave, btnLoad;
    EditText content, filenamev;
    TextView tvLoad;
    // Define some String variables, initialized with empty string
    String filepath = "";
    String filename = "";
    String fileContent = "";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnSave = findViewById(R.id.writebtn);
        btnLoad = findViewById(R.id.btnLoad);
        content = findViewById(R.id.content);
        filenamev = findViewById(R.id.filename);
        filepath = "NewDirectory";
        if(!isExternalStorageAvailableForRW()){
            btnSave.setEnabled(false);
        }
        btnSave.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                fileContent = content.getText().toString().trim();
                filename = filenamev.getText().toString().trim();
// Check for Storage Permission
                if(isStoragePermissionGranted()){
                    if(!fileContent.equals("")){
                        File myExternalFile = new
File(getExternalFilesDir(filepath), filename);
                        FileOutputStream fos = null;
                        try {
                            fos = new FileOutputStream(myExternalFile);
                            fos.write(fileContent.getBytes());
```

```
                        fos.close();
                    } catch (FileNotFoundException e) {
                        e.printStackTrace();
                    } catch (IOException e) {
                        e.printStackTrace();
                    }
                    content.setText("");
                    filenamev.setText("");
                    // Show a Toast message to inform the user that the
operation has been successfully completed.
                    Toast.makeText(MainActivity.this, "File saved to SD card.",
Toast.LENGTH_SHORT).show();
                } else{
// If the Text field is empty show corresponding Toast message
                    Toast.makeText(MainActivity.this, "Text field can not be
empty.", Toast.LENGTH_SHORT).show();
                }
            }
        }
        });
        btnLoad.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent myIntent = new Intent(MainActivity.this, ReadFile.class);
                MainActivity.this.startActivity(myIntent);
            }
        });
    }
    public boolean isStoragePermissionGranted() {
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.M) {
            if
(checkSelfPermission(android.Manifest.permission.WRITE_EXTERNAL_STORAGE)
                    == PackageManager.PERMISSION_GRANTED) {
//Permission is granted
                return true;
            } else {
//Permission is revoked
                ActivityCompat.requestPermissions(this, new
String[]{android.Manifest.permission.WRITE_EXTERNAL_STORAGE}, 1);
                return false;
            }
        }
        else {
//permission is automatically granted on sdk<23 upon installation
//Permission is granted
            return true;
        }
```

```
    }
    private boolean isExternalStorageAvailableForRW() {
// Check if the external storage is available for read and write by calling
// MEDIA_M/O/UNETnEvDi,ronment.getExternalStorageState() method. If the returned
state is
// then you can read and write files. So, return true in that case, otherwise,
false.
        String extStorageState = Environment.getExternalStorageState();
        if(extStorageState.equals(Environment.MEDIA_MOUNTED)){
            return true;
        }
        return false;
    }
}


//ReadFile.java

package com.example.ex7;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileReader;
import java.io.IOException;

public class ReadFile extends AppCompatActivity { Button btnLoad;
    TextView tvLoad; EditText filenamev; String filename = "";
    String filepath = "NewDirectory";


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

        btnLoad = findViewById(R.id.loadbtn); filenamev =
findViewById(R.id.filename2); tvLoad = findViewById(R.id.tvLoad);

        btnLoad.setOnClickListener(new View.OnClickListener() { @Override
        public void onClick(View view) {
            filename = filenamev.getText().toString().trim();
```

```
            FileReader fr = null;
            File myExternalFile = new File(getExternalFilesDir(filepath),
filename);
            StringBuilder stringBuilder = new StringBuilder();
            try {
                fr = new FileReader(myExternalFile); BufferedReader br = new
BufferedReader(fr); String line = br.readLine();

                while(line != null){ stringBuilder.append(line).append('\n'); line
= br.readLine();
                }
            } catch (FileNotFoundException e) { e.printStackTrace();
            } catch (IOException e) { e.printStackTrace();
            } finally {
                String fileContents = stringBuilder.toString();
tvLoad.setText(fileContents);
            }
        }
        });
    }
}
```

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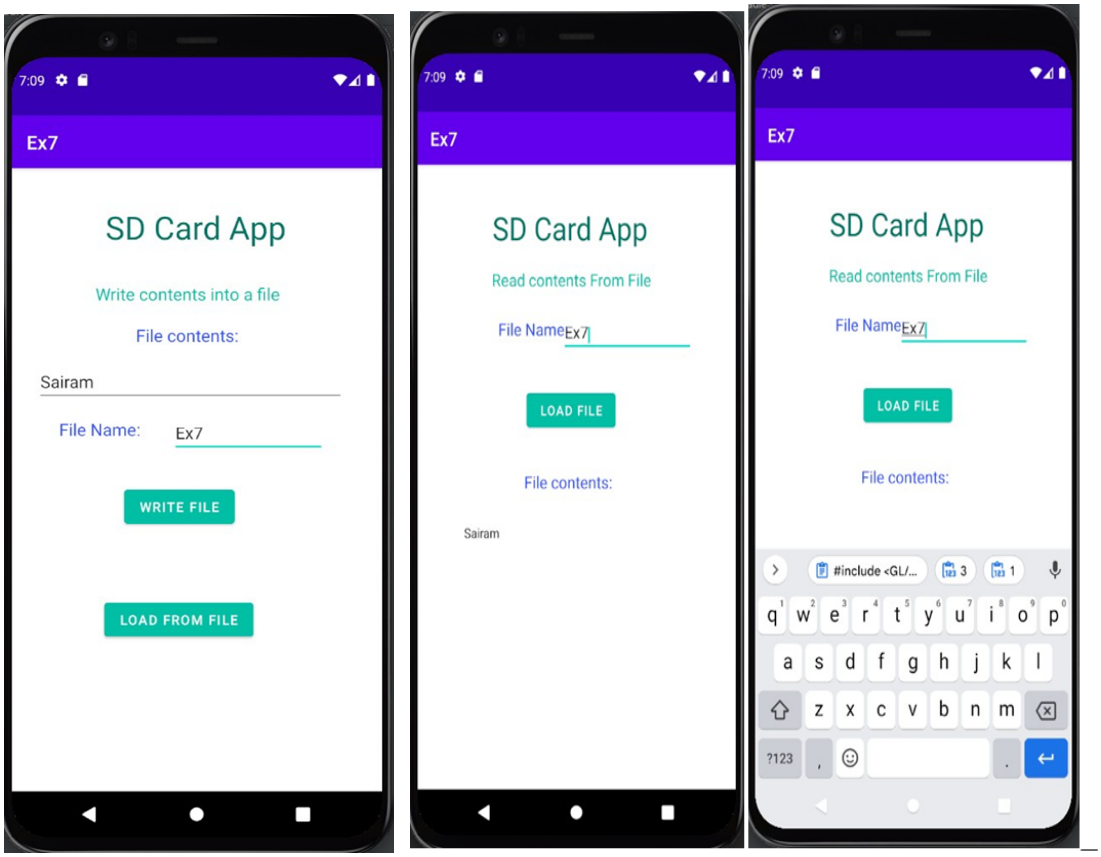
Output:



Learning outcomes:

- An android application to read and write from the SD card was implemented.
- Text is saved to and retrieved from the SD card.
