

## Practical No. 6

### Title: Android program using Shared Preferences, Internal and External Storage

**Aim: Create an application to demonstrate Shared Preferences, Internal and External Storage**

#### Introduction

Android provides many ways of storing data of an application. One of this way is called Shared Preferences. Shared Preferences allow you to save and retrieve data in the form of key, value pair.

In order to use shared preferences, you have to call a method `getSharedPreferences()` that returns a `SharedPreferences` instance pointing to the file that contains the values of preferences.

```
SharedPreferences sharedPreferences = getSharedPreferences(MyPREFERENCES, Context.MODE_PRIVATE);
```

The first parameter is the key and the second parameter is the MODE. Apart from private there are other modes available that are listed below –

Sr.No	Mode & description
1	<b>MODE_APPEND</b> This will append the new preferences with the already existing preferences
2	<b>MODE_ENABLE_WRITE_AHEAD_LOGGING</b> Database open flag. When it is set, it would enable write ahead logging by default
3	<b>MODE_MULTI_PROCESS</b>

	This method will check for modification of preferences even if the sharedPreferences instance has already been loaded
4	<b>MODE_PRIVATE</b> By setting this mode, the file can only be accessed using calling application
5	<b>MODE_WORLD_READABLE</b> This mode allows other application to read the preferences
6	<b>MODE_WORLD_WRITEABLE</b> This mode allows other application to write the preferences

You can save something in the sharedPreferences by using SharedPreferences.Editor class. You will call the edit method of SharedPreferences instance and will receive it in an editor object.

Its syntax is –

```
Editor editor = sharedPreferences.edit();  
editor.putString("key", "value");  
editor.commit();
```

Apart from the putString method, there are methods available in the editor class that allows manipulation of data inside shared preferences. They are listed as follows –

Sr. NO	Mode & description
1	<b>apply()</b> It is an abstract method. It will commit your changes back from editor to the sharedPreferences object you are calling
2	<b>clear()</b>

	It will remove all values from the editor
3	<b>remove(String key)</b> It will remove the value whose key has been passed as a parameter
4	<b>putLong(String key, long value)</b> It will save a long value in a preference editor
5	<b>putInt(String key, int value)</b> It will save an integer value in a preference editor
6	<b>putFloat(String key, float value)</b> It will save a float value in a preference editor

**Exercise - Create an application to save data in internal or external storage and also demonstrate implementation of shared preferences**

**Implementation:**

**Program:**

**Internal:**

**activity\_main.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=".MainActivity">
```

```
<TextView
```

```
    android:id="@+id/txtVwUserNm"
```

```
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
```

```
    android:text="@string/user_name_label"
```

```
    android:textSize="18sp"
```

```
    app:layout_constraintBaseline_toBaselineOf="@+id/txtUsrNm"
```

```
    app:layout_constraintHorizontal_bias="0.105"
```

```
    app:layout_constraintLeft_toLeftOf="parent"
```

```
    app:layout_constraintRight_toRightOf="parent" />
```

```
<TextView
```

```
    android:id="@+id/txtVwPass"
```

```
    android:layout_width="95dp"
```

```
    android:layout_height="30dp"
```

```
    android:layout_marginStart="28dp"
```

```
    android:text="@string/password_label"
```

```
    android:textSize="18sp"
```

```
    app:layout_constraintBaseline_toBaselineOf="@+id/txtPassword"
```

```
    app:layout_constraintHorizontal_chainStyle="spread_inside"
```

```
app:layout_constraintStart_toStartOf="parent"
```

```
tools:ignore="TextSizeCheck" />
```

```
<CheckBox
```

```
    android:layout_width="183dp"
```

```
    android:layout_height="wrap_content"
```

```
    android:id="@+id/chkBxRemMe"
```

```
    android:layout_marginBottom="344dp"
```

```
    android:layout_marginEnd="281dp"
```

```
    android:layout_marginStart="38dp"
```

```
    android:text="@string/remember_me_label"
```

```
    android:textSize="18sp"
```

```
    app:layout_constraintBottom_toBottomOf="parent"
```

```
    app:layout_constraintEnd_toEndOf="parent"
```

```
    app:layout_constraintHorizontal_bias="0.0"
```

```
    app:layout_constraintStart_toStartOf="parent" />
```

```
<Button
```

```
    android:layout_width="115dp"
```

```
    android:layout_height="48dp"
```

```
    android:id="@+id/btnSubmit"
```

```
    android:layout_marginTop="37dp"
```

```
    android:layout_marginBottom="277dp"
```

```
    android:text="@string/click_here_button"
```

```
    android:textStyle="bold"
```

```
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/chkBxRemMe" />
```

```
<EditText
```

```
    android:id="@+id/txtUsrNm"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="26dp"
    android:layout_marginTop="36dp"
    android:layout_marginBottom="92dp"
    android:ems="18"
    android:hint="@string/enter_username_hint"
    android:inputType="textPersonName"
    android:minHeight="48dp"
    android:textColorHint="#BD6E63"
    app:layout_constraintBottom_toTopOf="@+id/chkBxRemMe"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toEndOf="@+id/txtVwUserNm"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.496"
    tools:ignore="Autofill" />
```

```
<EditText  
    android:id="@+id/txtPassword"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_marginStart="20dp"  
    android:layout_marginTop="21dp"  
    android:layout_marginEnd="16dp"  
    android:layout_marginBottom="25dp"  
    android:ems="18"  
    android:hint="@string/enter_password_hint"  
    android:inputType="textPassword"  
    android:minHeight="48dp"  
    android:textColorHint="#BD6E63"  
    app:layout_constraintBottom_toTopOf="@+id/chkBxRemMe"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.0"  
    app:layout_constraintStart_toEndOf="@+id/txtVwPass"  
    app:layout_constraintTop_toBottomOf="@+id/txtUsrNm"  
    app:layout_constraintVertical_bias="0.35"  
    tools:ignore="Autofill" />  
</androidx.constraintlayout.widget.ConstraintLayout>
```

**activity\_file\_handling.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=".FileHandling"
>

<TextView
    android:id="@+id/textVwMsg"
    android:layout_width="284dp"
    android:layout_height="42dp"
    android:text="@string/click_on_the_button_below_to_clear_the_saved_text"
    android:textAlignment="center"
    android:textSize="18sp"
    android:textStyle="bold"
    app:layout_constraintBottom_toTopOf="@+id/txtVwInfo"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.496"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.416"
    tools:ignore="TextSizeCheck"
/>

<TextView
    android:id="@+id/txtVwInfo"
    android:layout_width="279dp"
    android:layout_height="39dp"
```



```
android:textSize="18sp"
android:textAlignment="center"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.486"
/>
```

```
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Clear Text"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.327"
/>
```

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

### MainActivity.java

```
package com.example.pracsix;
```

```
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
```

```
public class MainActivity extends AppCompatActivity {
    public static final String savedPref = "myPref";
    public static final String savedName = "UsrName";
    public static final String savedPass = "UsrPass";
    SharedPreferences sharedPreferences;
    EditText txtUsrNm, txtPassword;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
```

```
v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);

return insets;

});

txtUsrNm = findViewById(R.id.txtUsrNm);
txtPassword = findViewById(R.id.txtPassword);
Button btnSubmit = findViewById(R.id.btnSubmit);

btnSubmit.setOnClickListener(view -> {
    CheckBox chkBxRemMe = findViewById(R.id.chkBxRemMe);
    if(chkBxRemMe.isChecked()){
        saveSharedPref(view);
    }
    Intent intent = new Intent(MainActivity.this,FileHandling.class);
    MainActivity.this.startActivity(intent);
});
}

public void saveSharedPref(View view){
    String nm = txtUsrNm.getText().toString();
    String pass = txtPassword.getText().toString();
    sharedPreferences = getSharedPreferences(savedPref, MODE_PRIVATE);
    SharedPreferences.Editor editor = sharedPreferences.edit();
    editor.putString(savedName,nm);
    editor.putString(savedPass,pass);
    editor.apply();
}

@Override
protected void onResume() {
```

```
super.onResume();  
sharedPreferences = getSharedPreferences(savedPref, MODE_PRIVATE);  
String nm = sharedPreferences.getString(savedName, "");  
String pass = sharedPreferences.getString(savedPass, "");  
txtUsrNm.setText(nm);  
txtPassword.setText(pass);  
}
```

```
@Override  
protected void onDestroy() {  
    sharedPreferences = getSharedPreferences(savedPref, MODE_PRIVATE);  
    SharedPreferences.Editor editor = sharedPreferences.edit();  
    editor.clear();  
    editor.apply();  
    finish();  
    super.onDestroy();  
}
```

```
}
```

### **FileHandling.java**

```
package com.example.pracsix;
```

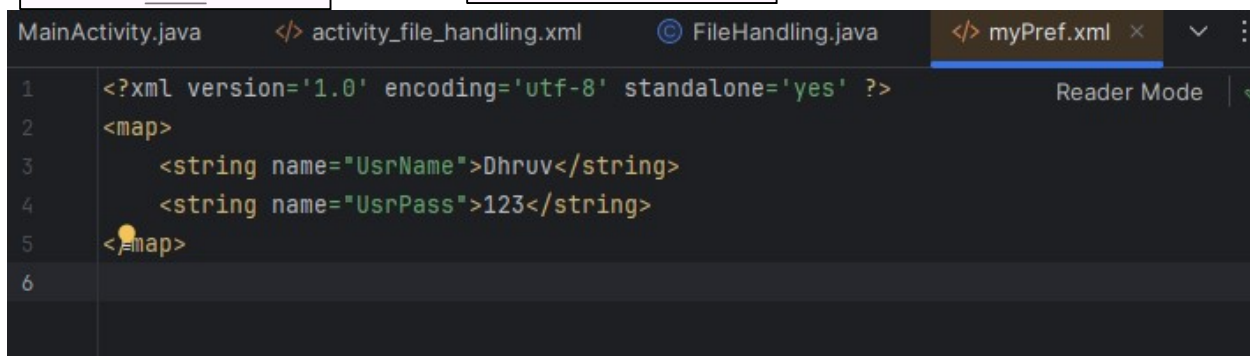
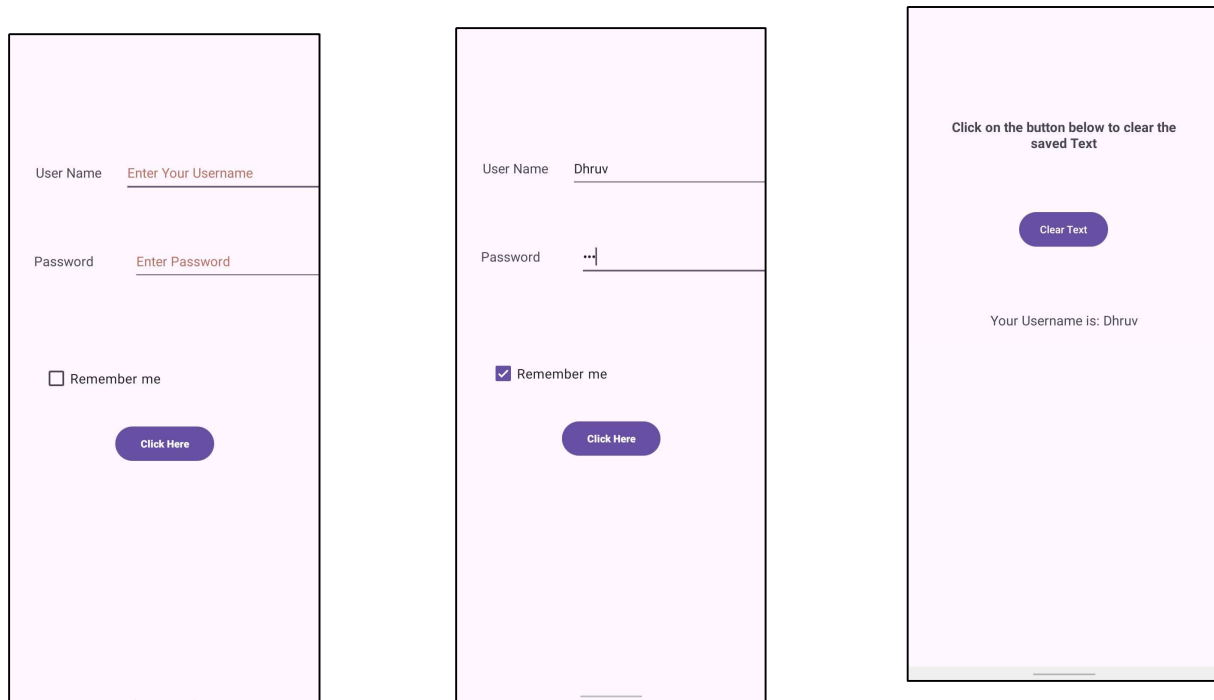
```
import static com.example.pracsix.MainActivity.savedPref;  
import static com.example.pracsix.MainActivity.savedName;
```

```
import android.annotation.SuppressLint;  
import android.content.SharedPreferences;
```

```
import android.os.Bundle;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class FileHandling extends AppCompatActivity {
    SharedPreferences sharedPreferences;
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_file_handling);
        getSharedRef();
        Button btnClear = findViewById(R.id.button);
        btnClear.setOnClickListener(view -> clearSharedRef());
    }
    @SuppressWarnings("SetTextI18n")
    private void getSharedRef() {
        TextView txtVwInfo = findViewById(R.id.txtVwInfo);
        sharedPreferences = getSharedPreferences(savedPref, MODE_PRIVATE);
        String name = sharedPreferences.getString(savedName, "No User Name");
        // String password = sharedPreferences.getString(savedPass, "No Password");
        txtVwInfo.setText("Your Username is: "+name);
    }

    private void clearSharedRef() {
        sharedPreferences = getSharedPreferences(savedPref, MODE_PRIVATE);
        SharedPreferences.Editor editor = sharedPreferences.edit().clear();
```

```
editor.apply();  
editor.commit();  
Toast.makeText(this, "Shared Preferences is deleted successfully", Toast.LENGTH_SHORT).show();  
getSharedRef();  
}  
}
```

**Output:**

**External:****main\_activity.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=".MainActivity">

<TextView
    android:id="@+id/tvDir"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="DIRECTORY NAME"
    android:textSize="25sp"
    android:textStyle="bold"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintBottom_toTopOf="@id/et1"
    app:layout_constraintVertical_bias="0.1" />

<EditText
    android:id="@+id/et1"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:autofillHints=""
    android:inputType="text"
    android:hint="Enter Name of the File"
    app:layout_constraintTop_toBottomOf="@id/tvDir"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    android:layout_marginTop="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginEnd="16dp" />

<TextView
    android:id="@+id/tvName"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="FIRST NAME"
    android:textSize="25sp"
    android:textStyle="bold"
    app:layout_constraintTop_toBottomOf="@id/et1"
```

```
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintEnd_toEndOf="parent"
android:layout_marginTop="24dp" />
```

```
<EditText
    android:id="@+id/et2"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:autofillHints=""
    android:inputType="text"
    android:hint="Enter the name of the Dir"
    app:layout_constraintTop_toBottomOf="@id/tvName"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    android:layout_marginTop="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginEnd="16dp" />
```

```
<TextView
    android:id="@+id/tvContent"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="CONTENT OF THE FILE"
    android:textSize="25sp"
    android:textStyle="bold"
    app:layout_constraintTop_toBottomOf="@id/et2"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    android:layout_marginTop="24dp" />
```

```
<EditText
    android:id="@+id/et3"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:autofillHints=""
    android:inputType="text"
    android:hint="Enter Content of the file"
    app:layout_constraintTop_toBottomOf="@id/tvContent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    android:layout_marginTop="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginEnd="16dp" />
```

```
<Button
    android:id="@+id/btnRead"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Read File"
```



```
app:layout_constraintTop_toBottomOf="@id/et3"  
app:layout_constraintStart_toStartOf="parent"  
android:layout_marginTop="24dp"  
android:layout_marginStart="32dp" />
```

```
<Button  
    android:id="@+id/btnDelete"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Delete the File"  
    app:layout_constraintTop_toBottomOf="@id/et3"  
    app:layout_constraintEnd_toEndOf="parent"  
    android:layout_marginTop="24dp"  
    android:layout_marginEnd="32dp" />
```

```
<Button  
    android:id="@+id/btnWrite"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Write to File"  
    app:layout_constraintTop_toBottomOf="@id/btnRead"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    android:layout_marginTop="16dp" />
```

```
<TextView  
    android:id="@+id/tvDisp"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:textSize="25sp"  
    android:textStyle="bold"  
    app:layout_constraintTop_toBottomOf="@id/btnWrite"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    android:layout_marginTop="32dp" />
```

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

### MainActivity.java

```
package com.example.fileoperations;
```

```
import android.os.Bundle;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.TextView;  
import android.widget.Toast;
```

```
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;
```

```
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileOutputStream;
import java.io.FileReader;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });

        EditText edit = findViewById(R.id.et1);
        EditText edit2 = findViewById(R.id.et2);
        EditText edit3 = findViewById(R.id.et3);
        Button btnRead = findViewById(R.id.btnRead);
        Button btnDelete = findViewById(R.id.btnDelete);
        Button btnWrite = findViewById(R.id.btnWrite);
        TextView output = findViewById(R.id.tvDisp);

        btnRead.setOnClickListener(view->{
            try {
                StringBuilder result = new StringBuilder();
                String line;
                String folder = getApplication().getFilesDir().getAbsolutePath()+
                File.separator+edit.getText().toString();
                File subFolder = new File(folder);
                BufferedReader bufferedReader = new BufferedReader(new FileReader(new
                File(folder,edit2.getText().toString())));
                while ((line = bufferedReader.readLine()) != null) {
                    result.append(line);
                }
                output.setText(result.toString());
            } catch (Exception e){
                Toast.makeText(getApplicationContext(),e.getMessage(), Toast.LENGTH_LONG).show();
                output.setText(null);
            }
        });
    }
}
```

```
btnWrite.setOnClickListener(view->{
    try{
        String folder = getApplication().getFilesDir().getAbsolutePath()+
File.separator+edit.getText().toString();
        File subFolder = new File(folder);
        if(!subFolder.exists()){
            subFolder.mkdir();
        }

        FileOutputStream outputStream = new FileOutputStream(new
File(subFolder,edit2.getText().toString()));
        outputStream.write(edit3.getText().toString().getBytes());
        outputStream.close();
        Toast.makeText(getApplicationContext(), "Writing Successfully", Toast.LENGTH_LONG).show();
        output.setText(null);
        edit.setText(null);
        edit2.setText(null);
        edit3.setText(null);

    }catch (Exception e){
        Toast.makeText(getApplicationContext(), e.getMessage(), Toast.LENGTH_LONG).show();
        output.setText(null);
    }
});
```

```
btnDelete.setOnClickListener(view->{
    try{
        String folder = getApplication().getFilesDir().getAbsolutePath()+
File.separator+edit.getText().toString();
        File subFolder = new File(folder);
        File file = new File(folder,edit2.getText().toString());
        while(file.exists()){
            file.delete();
        }
        Toast.makeText(getApplicationContext(), "Deleted Successfully", Toast.LENGTH_LONG).show();
        output.setText(null);
        edit.setText(null);
        edit2.setText(null);
        edit3.setText(null);

    }catch (Exception e){
        Toast.makeText(getApplicationContext(), e.getMessage(), Toast.LENGTH_LONG).show();
        output.setText(null);
    }
});
```

```
}  
}
```

**Output:**

DIRECTORY NAME	DIRECTORY NAME	DIRECTORY NAME	DIRECTORY NAME
Downloads	Enter Name of the File	Downloads	Enter Name of the File
FIRST NAME	FIRST NAME	FIRST NAME	FIRST NAME
dhruv.pdf	Enter the name of the Dir	dhruv.pdf	Enter the name of the Dir
CONTENT OF THE FILE	CONTENT OF THE FILE	CONTENT OF THE FILE	CONTENT OF THE FILE
It's me Dhruv Patel	Enter Content of the file	Enter Content of the file	Enter Content of the file
<div>Read File</div> <div>Delete the File</div> <div>Write to File</div>	<div>Read File</div> <div>Delete the File</div> <div>Write to File</div>	<div>Read File</div> <div>Delete the File</div> <div>Write to File</div>	<div>Read File</div> <div>Delete the File</div> <div>Write to File</div>
	Writing Successfully	It's me Dhruv Patel	Deleted Successfully

**Conclusion -**