Data Storage in Android

Android provides several ways to store data locally on the device.

Two of the most commonly used techniques are:
1. SharedPreferences
2. Internal Storage

1. SharedPreferences

- Used to **store small amounts of data** (key-value pairs).
- Example: login info, settings, preferences, etc.
- Data is stored in an XML file and persists even after app restart.
- Best for:
    - Saving username
    - App theme
    - Login state

2. Internal Storage

- Used for **storing files privately** on the device's memory.
- Files are saved in the app's internal directory.
- Other apps **cannot access** these files.
- Best for:
    - Saving notes, documents, or custom data files.
    - Data that should remain private to the app.

Example App: "User Notes App"

This app will:

- Save a **user's name** (using SharedPreferences).
- Save a **user note** (using Internal Storage).
- Retrieve the saved data when reopened.

1. activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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"
    android:orientation="vertical"
    android:padding="20dp"
    tools:context=".MainActivity">

    <EditText
```

```
    android:id="@+id/etName"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter your name" />

  <EditText
    android:id="@+id/etNote"
    android:layout_width="match_parent"
    android:layout_height="200dp"
    android:gravity="top"
    android:hint="Write your note here" />

  <Button
    android:id="@+id/btnSave"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Save Data" />

  <Button
    android:id="@+id/btnLoad"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Load Data"
    android:layout_marginTop="10dp" />

  <TextView
    android:id="@+id/tvDisplay"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Saved data will appear here"
    android:paddingTop="10dp"
    android:textSize="16sp" />
</LinearLayout>
```

2. MainActivity.kt

```
package com.example.usernotes

import android.content.Context
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.*

class MainActivity : AppCompatActivity() {

  private lateinit var etName: EditText
```

```
    private lateinit var etNote: EditText
    private lateinit var btnSave: Button
    private lateinit var btnLoad: Button
    private lateinit var tvDisplay: TextView

    private val PREF_NAME = "UserPref"
    private val FILE_NAME = "usernote.txt"

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        etName = findViewById(R.id.etName)
        etNote = findViewById(R.id.etNote)
        btnSave = findViewById(R.id.btnSave)
        btnLoad = findViewById(R.id.btnLoad)
        tvDisplay = findViewById(R.id.tvDisplay)

        btnSave.setOnClickListener {
            saveData()
        }

        btnLoad.setOnClickListener {
            loadData()
        }
    }

    private fun saveData() {
        val name = etName.text.toString()
        val note = etNote.text.toString()

        // Save name using SharedPreferences
        val sharedPref = getSharedPreferences(PREF_NAME, Context.MODE_PRIVATE)
        val editor = sharedPref.edit()
        editor.putString("username", name)
        editor.apply()

        // Save note using Internal Storage
        openFileOutput(FILE_NAME, Context.MODE_PRIVATE).use {
            it.write(note.toByteArray())
        }

        Toast.makeText(this, "Data Saved Successfully!", Toast.LENGTH_SHORT).show()
        etName.text.clear()
        etNote.text.clear()
    }

    private fun loadData() {
```

```
        // Load name
        val sharedPref = getSharedPreferences(PREF_NAME, Context.MODE_PRIVATE)
        val name = sharedPref.getString("username", "No name found")

        // Load note
        val note = try {
            openFileInput(FILE_NAME).bufferedReader().use { it.readText() }
        } catch (e: Exception) {
            "No note found"
        }

        tvDisplay.text = "Name: $name\nNote: $note"
    }
}
```

3. AndroidManifest.xml

```
Make sure your manifest includes the main activity:
<application
    android:allowBackup="true"
    android:label="@string/app_name"
    android:supportsRtl="true"
    android:theme="@style/Theme.AppCompat.Light.DarkActionBar">

    <activity android:name=".MainActivity">
        <intent-filter>
            <action android:name="android.intent.action.MAIN"/>
            <category android:name="android.intent.category.LAUNCHER"/>
        </intent-filter>
    </activity>
</application>
```

How it works?

1. When the user enters their name and note → clicks **Save**,
    - Name → saved using SharedPreferences
    - Note → saved in a file (Internal Storage)
2. When **Load Data** is clicked,
    - Both name and note are read back and shown in TextView.
3. Data persists even after app restarts.

Real-Life Use Cases

- **SharedPreferences:**
    - Save user's login session or app settings (like Dark Mode toggle).
- **Internal Storage:**
    - Store notes, drafts, documents, or offline data.