Exp:11	Implement an application that writes data to the SD card

Aim:

To develop an Android application that writes data to the **SD Card** (external storage) while handling runtime permissions and ensuring proper file operations.

Algorithm:

1. Check & Request Permissions
- Verify if the app has WRITE_EXTERNAL_STORAGE permission (for older Android versions).
- For Android 10 (API 29+) or later, use MANAGE_EXTERNAL_STORAGE if needed (scoped storage).

2. Verify SD Card Availability
- Check if the external storage (SD Card) is **available** and **writable**.

3. Create a File on SD Card
- Define a file path (e.g., /storage/emulated/0/MyApp/data.txt).
- Use FileOutputStream to write data to the file.

4. Write Data
- Open the file in write mode.
- Write sample text (e.g., "Hello, SD Card!").
- Close the file stream.

5. Display Success/Failure
- Show a **Toast** message confirming successful write or error.

Code:
MainActivity.kt:

```
package com.example.sdwriter
import android.Manifest
import android.content.pm.PackageManager
import android.os.Bundle
import android.os.Environment
import android.widget.Button
import android.widget.EditText
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import androidx.core.app.ActivityCompat
import androidx.core.content.ContextCompat
import java.io.File
import java.io.FileOutputStream
import java.io.IOException

class MainActivity : AppCompatActivity() {

    private val REQUEST_CODE = 100
```

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

    val inputText = findViewById<EditText>(R.id.input_text)
    val writeButton = findViewById<Button>(R.id.write_button)

    // Request permission if not already granted
    if (ContextCompat.checkSelfPermission(this,
Manifest.permission.WRITE_EXTERNAL_STORAGE)
        != PackageManager.PERMISSION_GRANTED) {
        ActivityCompat.requestPermissions(
            this,
            arrayOf(Manifest.permission.WRITE_EXTERNAL_STORAGE),
            REQUEST_CODE
        )
    }
    writeButton.setOnClickListener {
        val data = inputText.text.toString()
        if (data.isNotBlank()) {
            writeToFile(data)
        } else {
            Toast.makeText(this, "Please enter some text", Toast.LENGTH_SHORT).show()
        }
    }
}
private fun writeToFile(text: String) {
    if (Environment.getExternalStorageState() == Environment.MEDIA_MOUNTED) {
        val file = File(getExternalFilesDir(null), "output.txt")
        try {
            FileOutputStream(file, true).use { output ->
                output.write((text + "\n").toByteArray())
                Toast.makeText(this, "Data written to ${file.absolutePath}",
Toast.LENGTH_LONG).show()
            }
        } catch (e: IOException) {
            Toast.makeText(this, "Failed to write: ${e.message}",
Toast.LENGTH_LONG).show()
        }
    } else {
        Toast.makeText(this, "External storage not available",
Toast.LENGTH_SHORT).show()
    }
}

override fun onRequestPermissionsResult(
    requestCode: Int,
    permissions: Array<out String>,
    grantResults: IntArray
) {
```

```
        super.onRequestPermissionsResult(requestCode, permissions, grantResults)
        if (requestCode == REQUEST_CODE && grantResults.isNotEmpty()) {
            if (grantResults[0] == PackageManager.PERMISSION_GRANTED) {
                Toast.makeText(this, "Permission granted", Toast.LENGTH_SHORT).show()
            } else {
                Toast.makeText(this, "Permission denied", Toast.LENGTH_SHORT).show()
            }
        }
    }
}
```

Activity_main.xml:

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    android:orientation="vertical"
    android:gravity="center">

    <EditText
        android:id="@+id/input_text"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter text here"
        android:padding="12dp"
        android:background="@android:drawable/edit_text"
        android:textSize="16sp" />

    <Button
        android:id="@+id/write_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Write to File"
        android:layout_marginTop="20dp" />
</LinearLayout>
```

AndroidManifest.xml:
```xml
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.sdwriter">

    <!-- Permission to write to external storage -->
    <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"
/>
    <application
        android:allowBackup="true"
        android:label="SDWriter"
        android:theme="@style/Theme.AppCompat.Light.NoActionBar"
        android:supportsRtl="true">
```
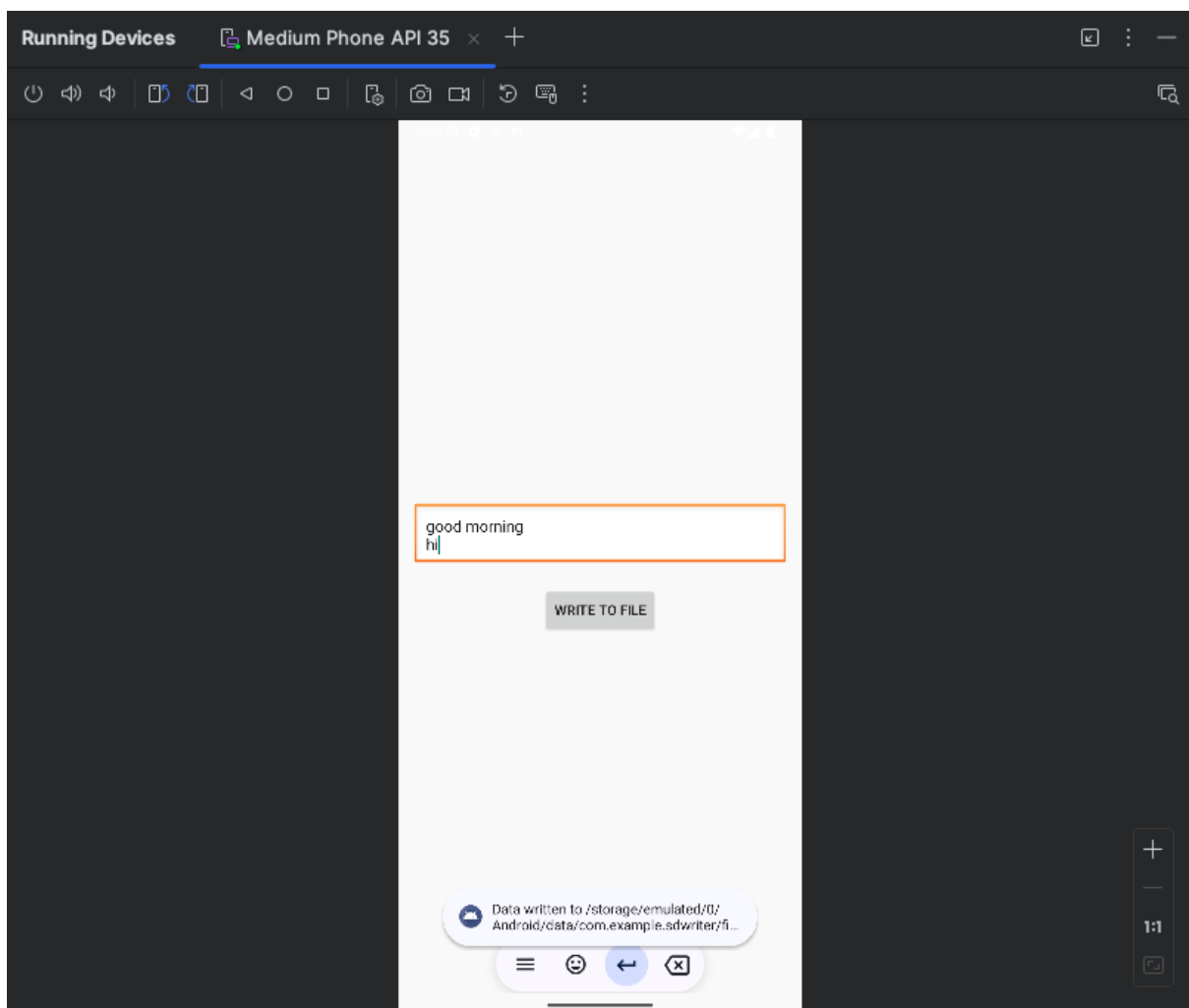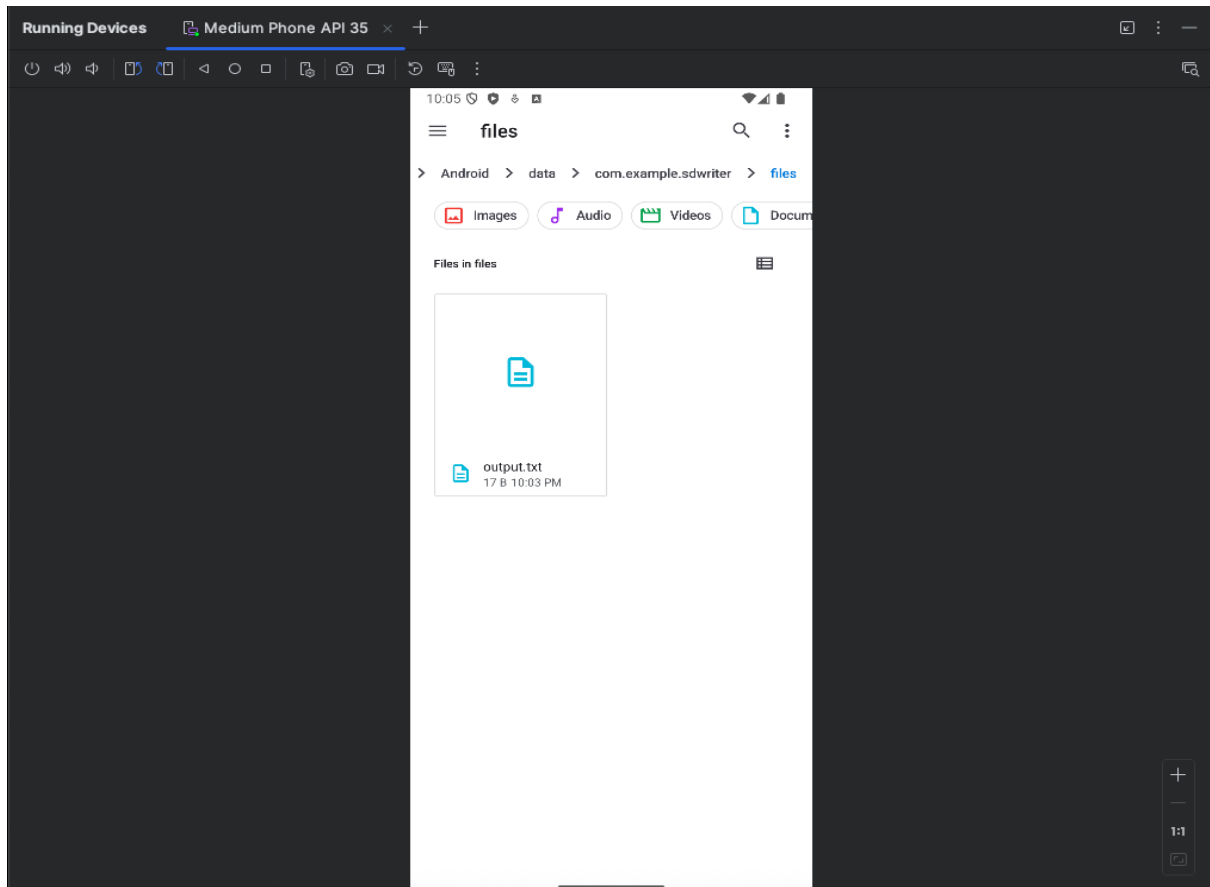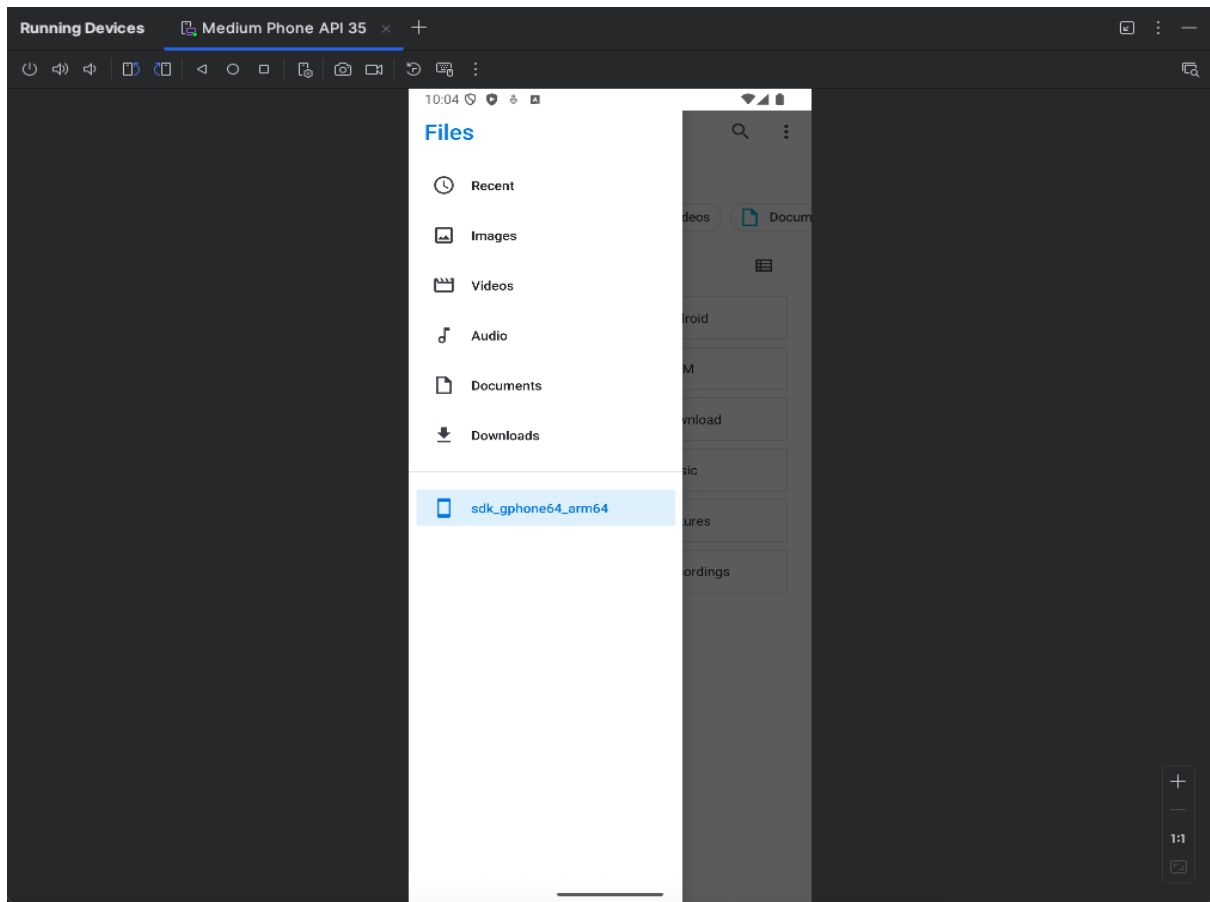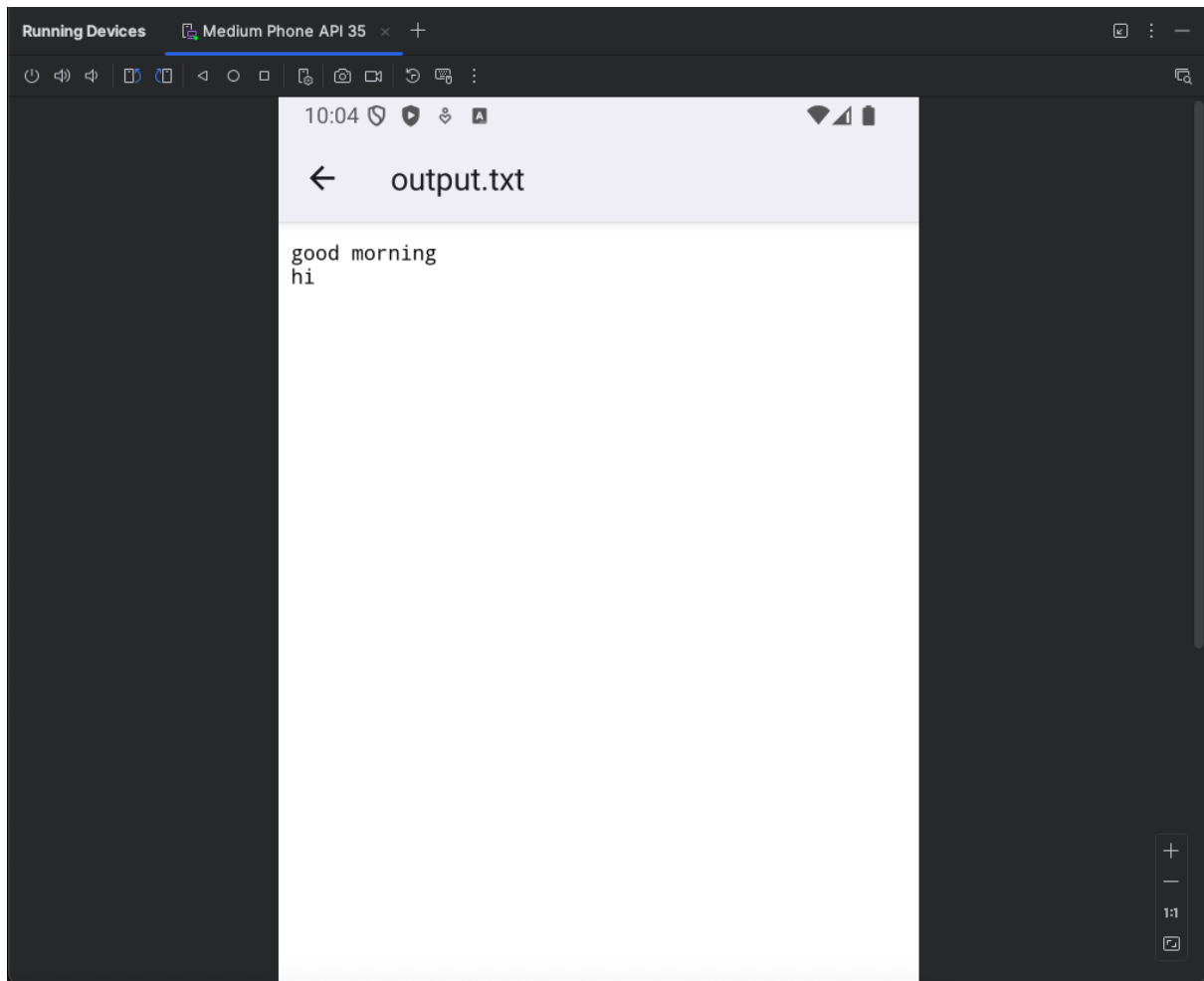
```
<!-- MainActivity with android:exported explicitly set -->
<activity android:name=".MainActivity"
    android:exported="true"> <!-- Set this to true to export the activity -->
    <intent-filter>
        <action android:name="android.intent.action.MAIN"/>
        <category android:name="android.intent.category.LAUNCHER"/>
    </intent-filter>
</activity>

    </application>
</manifest>
```

Output:

10:04

←   output.txt

```
good morning
hi
```

Result:

Thus the give program is executed successfully.