**In-Memory File System Documentation**

**1. Implementation Overview**

The in-memory file system is implemented in Java and simulates basic file system operations in an interactive command-line interface. It supports functionalities like creating directories, changing the current directory, listing contents, creating and editing files, moving and copying files and directories, and removing files and directories.

**2. Data Structures Used**

The primary data structures used in the implementation are:

**Directory Class**: Represents a directory and contains lists of subdirectories and files.

**File Class**: Represents a file and contains the file name and content.

**InMemoryFileSystem Class**: Manages the overall file system, providing methods for various operations.

**3. Design Decisions**

**Directory Structure**: Directories are represented as a tree structure with a root directory. Each directory contains lists of subdirectories and files.

Used ArrayLists for storing these all and Arrays for splitting the command enter by the user.

**Command Handling**: Commands are processed in an interactive loop, where user input is parsed to execute corresponding operations.

**Error Handling**: The system handles errors gracefully, providing meaningful messages for invalid inputs or operations.

**Recursive Operations**: Operations like copying and moving directories are implemented recursively to handle nested structures.

**4. Implementation Details**

The implementation includes methods for each supported operation, including mkdir, cd, ls, touch, echo, cat, mv, cp, and rm. Directory navigation supports relative and absolute paths.

**5. Setup Instructions**

To run the program, follow these steps:

**Step 1**: Prerequisites

Ensure that Java is installed on your system.

**Step 2**: Clone the Repository

**git clone https://github.com/your/InitoAssessment.git**

**cd in-memory-file-system**

**Step 3:** Compile the Java Code

**javac InMemoryFileSystem.java**

**Step 4**: Run the Program

**java InMemoryFileSystem**

**6. Example Usage**

Here are some example commands you can try in the interactive interface:

**mkdir** documents

**cd** documents

**touch** readme.txt

**echo** 'This is a readme file.' > readme.txt

**ls**

**cat** readme.txt

**cd** **..**

**rm** documents

**ls**

**Conclusion**

This in-memory file system provides a simple and interactive environment for users to simulate basic file system operations. The code is designed for clarity, modularity, and ease of understanding.