CSC 262 Operating Systems Course
Lab Final Question
(UPDATED)

File System and Manager Console

Objectives
You are asked to implement a virtual file system and a command line interface for the file system.
Basic operations you need to handle:
1. Open a File for reading : Open a file and lock accesses until it is closed
2. Open a File for writing : Open a file and lock accesses until it is closed
3. Close a File: close and remove all the locks
4. Copy a file
5. Move a file (Canceled)
6. Delete a file
7. Create a file
8. Insert into a file
9. List available files

Details
You can provide any command set for the above operations from the command line interface you have created.
You can code your project at any language (preferably in Java)
Provide a global locking solution for your files.
Provide a string insertion to your file and you are free to come with any design you want.
Do not use the file locks in operating system level or java virtual machine. Instead, provide your own solution for file locks.
Provide a synchronization mechanism for readers or writer locks.
You can create the file system virtually (you don't even need to create files or directories on the file system of operating system, you can handle the file system only in ram with classes if you feel more comfortable).
Each file will have a name, size of characters and access time in your file system.

How to Test Your Program:
1. Run a console application.
2. Try some files (for example: a.txt, b.txt, c.txt etc.)
3. Copy a file onto another file (for example cp a.txt to b.txt)
4. Open a file for reading (for example a.txt)
5. Try to open the same file for reading again (for example a.txt one more time, action expected: allow reading simultaneously)
6. Try to open the same file for writing this time (for example a.txt for writing while it is still open, action expected: don't allow while file is open for reading)
7. Try to copy from a read lock active file (for example cp a.txt b.txt, action expected: you allow, since reading lock allows to read from a.txt)
8. Try to copy to a read lock active file (for example cp b.txt a.txt, action

expected: you don't allow, since reading lock allows only read from a.txt)

9. Delete an open file (for example delete a.txt, action expected: don't allow while a lock is active)
10. Insert into a file opened for reading (for example a.txt, action expected: you have read lock so you can not write)
11. Close a file (for example a.txt)
12. Open a file for writing (for example a.txt for writing)
13. Open same file for reading (for example a.txt for reading. Action expected: you can not read from the file, while a write lock is active)
14. Try to delete the file (action expected you can not delete while a lock is active)
15. Try to copy from the file (cp a.txt b.txt, action expected: you can not copy from a write active file)
16. Try to copy into the file (cp a.txt b.txt, action expected: you can not copy to a write active file)

For some of the steps above, you may need to run more than 1 console application simultaneously.