CSE222 – Homework5 – Question1

Report

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Problem Solution Approach :

* Problem Definition :

Implement **FileSystemTree** class to handle a file system hierarchy in a general tree structure. You need to implement **FileNode** class to handle the nodes of the tree. A node can be created either for a file or a directory. You will decide how discrimination is done between files and directories.

Your **FileSystemTree** implementation must have the following:

A constructor to create a file system with a root directory. Name of the root directory will be given as a parameter to the constructor.

addDir and **addFile** methods to add directories or files to the file system. The path of the new directory (or file) will be given as a parameter to the method.

remove method to remove a directory (or a file) from the file system. The path of the directory (or the file) will be given as a parameter to the method. The method will warn the user if the path cannot be found. If the directory includes some other directories (or files), method will list the contents and ask the user whether to remove or not.

search method to search the entire file system for a directory or a file including the given search characters in its name. The search characters will be given as the parameter of the method.
printFileSystem method to print the whole tree.

* Approach :

Filesystem is a system that can handle both file and directories. Directories can own the file and other directories, but each file are unique and cannot own any subdirectories and files. In the developing process , there can be infinite file and directories under the specific directories . It was obvious I need to use tree. System can be implemented with different data structure. But tree especially **general tree** would be a good one. There are so many kinds of tree types, but **general tree** node can contain infinite sub node. It means that there can be infinite interbedded tree under the root one. There are two different method for traversing on the tree which are preorder and postorder. There is another traversing method which is inorder but was not used in this assignment. These methods were mentioned in Javadoc of the project.

Test Cases:

Constructors Test:

Test ID	Scenario	Test Data	Expected Result	Actual Result	Pass	Fail
T01	Creating FileSystem	Initialized object name is " fileSystem "	Initialize a filesystem with given root as String.	Expected result has occurred.	✓	

Methods Test:

Test ID	Scenario	Test Data	Expected Result	Actual Result	Pass	Fail
T01	- addDir(root/Desktop)	root , Desktop	Desktop is located under the root directory.	Expected result has occurred.	✓	
T02	- addDir(root/Desktop/HWs)	root , Desktop , HWs	HWs is located under the Desktop directory.	Expected result has occurred.	✓	
T03	- addDir(root/GTU)	root , Desktop , HWs , GTU	GTU is located under the root directory.	Expected result has occurred.	✓	
T04	- addDir(root/Pictures)	root , Desktop , HWs , GTU , Pictures	Pictures is located under the root directory.	Expected result has occurred.	✓	
T05	- addDir (root/Pictures/Gebze)	root , Desktop , HWs , GTU , Pictures , Gebze	Gebze is located under the Pictures directory.	Expected result has occurred.	✓	
T06	-addFile (root/Pictures/Gebze/pic1.png)	root , Desktop , HWs , GTU , Pictures , Gebze, pic1.png	pic1.png is located under the Gebze as a file.	Expected result has occurred.	✓	
T07	-addFile (root/Pictures/Gebze/pic2.png)	root , Desktop , HWs , GTU , Pictures , Gebze , pic1.png , pic2.png	Pic2.png is located under the Gebze as a file.	Expected result has occurred.	✓	
T08	-addFile (root/Pictures/Gebze/pic3.png)	root , Desktop , HWs , GTU , Pictures , Gebze, pic1.png ,pic2.png ,pic3.png	Pic3.png is located under the Gebze as a file.	Expected result has occurred.	✓	
T09	-addFile (root/Desktop/HWs/HW1.pdf)	root , Desktop , HWs , GTU , Pictures , Gebze, pic1.png ,pic2.png ,pic3.png , HW1.pdf , HW2.pdf	HW1.pdf is located under the HWs as a file.	Expected result has occurred.	✓	
T09	-addFile (root/Desktop/HWs/HW2.pdf)	root , Desktop , HWs , GTU , Pictures , Gebze, pic1.png ,pic2.png ,pic3.png , HW1.pdf , HW2.pdf	HW2.pdf is located under the HWs as a file.	Expected result has occurred.	✓	
T10	-addFile (root/GTU/Project.pdf)	root , Desktop , HWs , GTU , Pictures ,Gebze , pic1.png ,pic2.png ,pic3.png , HW1.pdf , HW2.pdf, Project.pdf	Project.pdf is located under the GTU as a file.	Expected result has occurred.	✓	
T11	- remove (root/Pictures/Gebze/pic3.png)	root , Desktop , HWs , GTU , Pictures ,Gebze, pic1.png ,pic2.png , HW1.pdf , HW2.pdf, Project.pdf	pic3.png is removed from the filesystem.	Expected result has occurred.	✓	

T12	- remove (root/Pictures/Gebze)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Ask the user whether He / She is sure for removing Gebze and its subfiles and subdirectories included. (Y)	Expected result has occurred.	✓	
T13	- search(HW)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the all directories and files that are contain "HW" in their name.	Expected result has occurred.	✓	
T14	- search(.pdf)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the all directories and files that are contain ".pdf " in their name.	Expected result has occurred.	✓	
T15	- search(CSE241)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the error statement that informs the user : search: 'CSE241': No such file or directory	Expected result has occurred.	✓	

Invalid Input Testing Test:

Test ID	Scenario	Test Data	Expected Result	Actual Result	Pass	Fail
T01	- addDir (root/Home/Games)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the error statement that informs the user : addDir: cannot create directory 'root/Home/Games': No such directory	Expected result has occurred.	✓	
T02	- addFile (root/Home/regulation.pdf)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the error statement that informs the user : addFile: cannot create file 'root/Home/regulation.pdf': No such directory	Expected result has occurred.	✓	
T03	- remove(root/Home)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the error statement that informs the user : remove: cannot remove 'root/Home': No such file or directory	Expected result has occurred.	✓	
T04	- remove(root/regulation.pdf)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the error statement that informs the user : remove cannot remove 'root/regulation.pdf': No such file or directory	Expected result has occurred.	✓	
T05	- remove(root)	root , Desktop , HWs , GTU , Pictures, HW1.pdf , HW2.pdf, Project.pdf	Print the error statement that informs the user : remove: permission denied 'root': Root directory cannot be removed	Expected result has occurred.	✓	

Class Diagram :

Class diagram is inserted to the homework file.

Running Commend and Result:

Running command and result stage is inserted to the homework file.