Object Oriented Programming

Spring 2022 (CS-A, CS-B)

Assignment#4

Submission Date: *Tuesday 10ᵗʰ May 2022*

We want to implement a prototype file system. A file system keeps record of all the files and folders created in a drive/file system. The major components of a file system are files and folders. Each file has a name, content, link to parent folder, creation date and last accessed date. A folder has a name, creation date, last accessed date, number of files, number of subfolders, link to parent folder, collection of files and collection of subfolders. An object of a file system has a root folder initially. All the files/folders created after wards will be created in root folder or subfolders of root. We want to implement following function for the file system:

Create file: given a path, file name and file contents, this function must create a new file at the mentioned path if the path exists in the file system. Otherwise, it must print an error "No such path exists". For example if path is "root\OOP" then, path is correct if a folder named OOP is already present in the root folder. Note that you must also update the creation date, last accessed date and link to parent folder.

Create folder: given a path and folder name, this function must create a new empty folder if the path exists in the file system. Otherwise, it must print an error "No such path exists". For example if path is "root\OOP" then path is correct if a folder named OOP is already present in the root folder. Note that you must also update the creation date, last accessed date and link to parent folder.

Remove file: Given the path of the file (including file name e.g "root\OOP\assignment4.txt", this function must remove/delete the given file (if it exists) from the file system and update its parent folder

Remove folder: given the path (including the folder name), this function must remove the folder if it exists. Removing folder will also result in removing all the files and subfolders of the given folder. Please note that root folder cannot be removed.

Read file: Given the path including file name, display the contents of file on the screen and change the access date of file, if such file exists.

List folder: Given a path P, list names of all the files and folders in P. For example, if the path is "root\OOP\assignments" then it must output all the files and folders given in the assignment folder.

For simplicity you can assume that all the names of files and folders are case sensitive and does not include spaces. Also use the concepts of composition/aggregation to implement this system.

You will have to implement Following classes:

File, Folder, Date and file system

In the folder class, you can store collection of files as dynamic array of files (initially of size 2) and collection of folders as dynamic array of folders (initially of size). Double the array size whenever this array is full and create file/folder function is called. Please implement required constructors, copy

constructors and destructors. You can also implement helper functions that are required to implement above mentioned functions.