Gebze Technical University
Department of Computer Engineering
CSE 241/501
Object Oriented Programming / Programming
Fall 2023
Homework # 2
Due date Jan 9th 2024

In this homework, we are going to make our simple Operating System Shell that can handle only some file operations. Your OS will have at most 10 MB disk space. This OS space should be kept between the shell runs, it should not be deleted, it should remember the disk contents of the provious run. A sample run is given below

```
myShell
> ls
D .             Dec 25 00:42
> mkdir myDir
> ls
D .          Dec 25 00:42
D myDir           Dec 25 00:44
> cd myDir
> ls
D .             Dec 25 00:44
D ..            Dec 25 00:42
> cp /etc/SomeFile .
> ls
D .             Dec 25 00:44
D ..            Dec 25 00:42
F SomeFile  Dec 25 00:45      25345Bytes
```

The commands, their parameters and definitions are given below

Operation	**Parameters**	**Explanation**	**Notes**
ls	- R	Lists the contents of the current directory R is for recursive listing	
mkdir	Directory name name	Makes or removes a directory	
rm	file name	Deletes file in the	Gives and error message if the directory

		current directory	cannot be removed
cp	Source file and destination file name	Copies the source file to the destination file	The directories can be copied too. The source files can be in your regular OS file system. The destination is always the current directory.
link	Source file and destination file name	Makes a soft link between the source file and the destination file	It behaves very much like ln –s command of UNIX shell
cd	Path to the new current directory	Changes the current directory	It behaves very much like cd command of UNIX shell. cd . and cd .. are valid
cat	File name	Types the file contents on the screen	See the text about iterators.

You will write a base abstract class file. The class will have as many generic implementations are possible. For example, "cat" command should be implemented in this class.
Then, there are three concrete file classes: directory, soft linked file and a regular file.
Each file type provides an iterator that gives the file elements one by one. For regular files and the linked files, the entries are regular file bytes. For directories, the elements are directory entries.

Notes:

- Use C++11 standard and you may any features that we learned in the class.
- Follow header, source code, namespace, and other rules.
- **Test your programs very carefully at least with 5 different runs.**
- **Do not forget to submit your main OS disk space.**
- You should submit your work to the Teams page using the instructions from the TAs.
- You will demo your homework online