CSCI-7645: Practice Problem Set 1

Fairleigh Dickinson University Vancouver
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Instructions

Solve every problem on your own. For this practice problem set, implement file operations using `open`, `close`, `read`, `write`, `lseek`, but not `fopen`, `fclose`, `fread`, `fscanf`, `fwrite`, `fprintf`, `fseek`.

Problems

1. Consider the functions `stringToLower` and `stringToUpper` in Example 3 (`visitor`). Their implementations are identical except that the first function calls `lower` while the latter calls `upper`. Replace them by a single function with signature
   `void stringModify(char* input, char (*visit)(char))`
   so that `stringToLower(input)` can be implemented as `stringModify(input, lower)`
   and `stringUpper(input)` can be implemented as `stringModify(input, upper)`.

2. Create your own version of the file copy program that has an append option, such that the command:

   ```
   ./copy source.txt destination.txt -a
   ```

   will append the contents of `source.txt` to the existing contents of `destination.txt` if the latter already exists.

3. Create your own version of the `cat` program which concatenates the contents of any number of text files and displays it on the screen. For example, suppose `file1.txt` contains `Mary had a little lamb`, `file2.txt` contains `Its fleece was white as snow`, `file3.txt` contains `And everywhere that Mary went`, and `file4.txt` contains `The lamb was sure to go`. Then, the command:

   ```
   ./cat file1.txt file2.txt file3.txt file4.txt
   ```

   should print the following to the screen:

   ```
   Mary had a little lamb
   Its fleece was white as snow
   And everywhere that Mary went
   The lamb was sure to go
   ```

   Hint. Use `argc` to find out how many files need to be concatenated.

4. Create a program `showAllContents` that accepts a path to a directory as command line argument and prints out the names of all files and directories contained in it. Suppose the folder `/home/john/csci7645` contains folders `chapter1` and `chapter2`. Suppose `chapter1` contains files `program1.c` and `program2.c` and `chapter2` contains files `program3.c` and `program4.c`. Then running the following:

```
./showAllContents /home/john/csci7645
```

should print:

```
 chapter1
   program1.c
   program2.c
chapter2
   program3.c
   program4.c
```