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November 13th, 2023
Operating Systems
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Smear Program Writeup

Running the Program

To run the program, you should have this program and the target files in the same directory. This program expects at least 4 command line arguments, if argc is less than 4, an error message will print indicating the expected format of the command line arguments and then exiting. After compiling the program. run the command ./a.out Target Replacement File1 File2 . . . in the terminal.(Make sure everything is within the same directory)

Test Cases

Test Case #1: Replacing Words In Multiple Files

To showcase our program's functionality, we had it substitute every instance of the word "hi" with "li" in two sample files: file1.txt and file2.txt. As depicted in Figure 1, upon executing the program, it reports the target and replacement words, along with the size of each file, to standard error. And upon inspecting the file contents, we observe that the expected substitution of every "hi" with "li" has indeed taken place.

file1.txt before smear:

Hi, amidst hills, a hiker hinged his hiking stick, saying hi to high-flying kites while enjoying the hi-lltop view. The hidden, hi-biscus-filled hi-deaway hi-nted with
i-larious hum as the hiker embraced the hi-spirited ambiance, feeling a hi-dden sense of happiness. With a hi, he bid farewell, carrying with him a handful of cherishe
-laden memories.

file2.txt before smear:

Hi! Hilariously, a hippo hibernated in a hidden, high-tech hive. The hive, being highly innovative, housed hi-fi gadgets and higgledy-piggledy contraptions. The hippo,
h a hipster attitude, happily interacted with hi-res holograms and hi-def screens, creating a hi-ghly entertaining environment. Hitherto, the hive became a haven for h
s seeking a hi-tech hiatus. The hi-jinks inside were so hysterical that even the hitherto somber hippos couldn't help but break into fits of hilarity.

Length of Target: 2, Length of Replacement: 2
hi li
The size of the file is 360 bytes
The size of the file is 494 bytes
SUCCESS

file1.txt after smear:

Hi, amidst lills, a liker linged lis liking stick, saying li to ligh-flying kites wlile enjoying the li-lltop view. The lidden, li-biscus-filled li-deaway li-nted with
i-larious hum as the liker embraced the li-spirited ambiance, feeling a li-dden sense of happiness. With a li, he bid farewell, carrying with lim a handful of cherishe
-laden memories.

file2.txt after smear:

Hi! Hilariously, a lippo libernated in a lidden, ligh-tech live. The live, being lighly innovative, housed li-fi gadgets and liggledy-piggledy contraptions. The lippo,
h a lipster attitude, happily interacted with li-res holograms and li-def screens, creating a li-ghly entertaining environment. Hitherto, the live became a haven for l
s seeking a li-tech liatus. The li-jinks inside were so hysterical that even the litherto somber lippos couldn't help but break into fits of lilarity.

Figure 1: Test Case Demonstrating Functionality of Smear Program

Test Case #2: Replacement and Target Word Not of Same Length

Since our program can only handle cases where the replacement and target words were of the same length, we decided to check that this condition is satisfied before attempting the replacement. If the condition doesn't hold then the program reports this to standard error and terminates.

```
PS C:\Users\ssk48\OneDrive\Desktop> ./smear hi bye file1.txt file2.txt
Length of Target: 2, Length of Replacement: 3
hi bye
lengths are not equal
PS C:\Users\ssk48\OneDrive\Desktop> echo $?
1
PS C:\Users\ssk48\OneDrive\Desktop>
```

Figure 2: Program Output When Target and Replacement Words Are Of Different Lengths

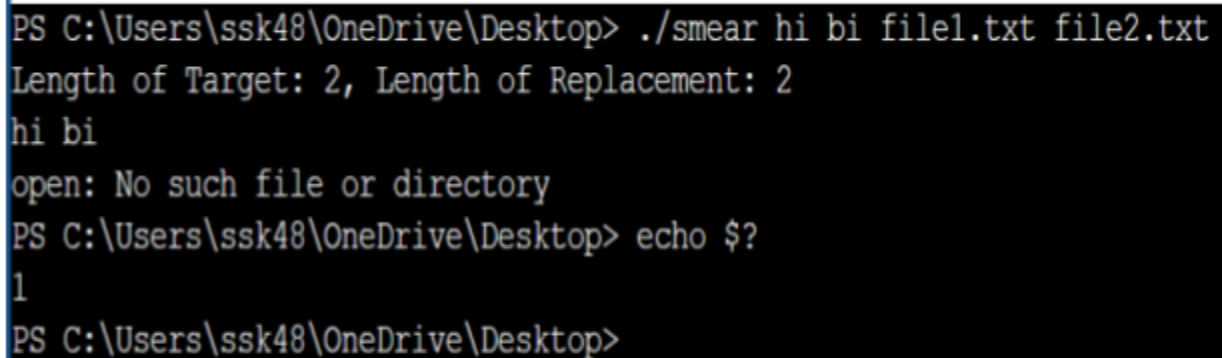## Test Case #3: Replacement and Target Word Are the Same

In the event that the replacement and target words are the same, then it would be inefficient for our program to go through the contents of the files since the output files would look exactly the same as the input files. So instead if this occurs, in our program, we simply report to standard error that the target and replacement words are the same and terminate the program as can be seen in Figure 3.

```
PS C:\Users\ssk48\OneDrive\Desktop> ./smear hi hi file1.txt file2.txt
Length of Target: 2, Length of Replacement: 2
hi hi
Target and replacement are the same
PS C:\Users\ssk48\OneDrive\Desktop> echo $?
1
PS C:\Users\ssk48\OneDrive\Desktop>
```

Figure 3: Program Output When Target and Replacement Words Are The Same

Test Case #4: Input File Does Not Exist

In this test case, one of the input files doesn't exist. We expect that after checking to see if the target and replacement words of the same length and aren't the same, the program will report to standard error that it was unable to open one of the files. And as can be seen in Figure 3, this is exactly what happens.


```
PS C:\Users\ssk48\OneDrive\Desktop> ./smear hi bi file1.txt file2.txt
Length of Target: 2, Length of Replacement: 2
hi bi
open: No such file or directory
PS C:\Users\ssk48\OneDrive\Desktop> echo $?
1
PS C:\Users\ssk48\OneDrive\Desktop>
```

Figure 4: Program Output When Input File(s) Do Not Exist