COL216 Assignment-1 Part 2

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Report:

I have used 4 seperate files.

1. *test*2.*s*
2. *String_comp.s*
3. *UsefulFunctions.s*
3. *merge.s*

1. test.s:

This file contains our *main* function and is mainly to take user inputs and give output.

On running this program, The console asks you to enter the number of strings in the 2 list, Then you enter *strings* of length upto 1024 characters terminating with a $\backslash r$ or $\backslash n$ in ascending order and then an Integer 0 or 1 to check for duplicate removal or not and then an Integer 0 or 1 to check for case insensitive or case sensitive comparison respectively.

This user input is done by using $fgets$ function.

Then we call the *merge* function which merges the two sorted list according to the preferences

We then print the newly formed list by iterating through its pointer.

2. String_comp.s:

This program compares 2 strings and checks which one is lexicographically smaller. This is done by iterating through the lines of code and checking until one character is different between the two strings. If no such character is found, We say the strings are equal.

We also have a chunk of code which converts lower case characters to upper case in case we need to do a case insensitive comparison.

3. UsefulFunctions.s:

We use the *prints* and the $fgets$ functions with slight modification to take input and produce an output from and to the console respectively in our *test*2.*s* file.

4. merge.s:

If the input list are of size n and m respectively then we first create a sorted list of size $n + m$. this is done by iterating through the lists and adding the smaller element at any point to our new list and then reiterating. In the end the elements remaining in any list are added without checking as they are definitely larger.

Then we have a function that removes duplicates in the final list. Since the list is sorted we only need to check adjacent elements for duplicates. We go on checking till the end of list and remove the elements which are same. It takes $O(n + m)$ time.

Results:

```
Number of strings in List 1: 3
Input String
haha
Input String
hehe
Input String
hihi
Number of strings in List 2: 2
Input String
haha
Input String
hehe
Type 0 to delete duplicates or 1 to not delete duplicates and press enter: 0
Type 0 for Case Insensitive or 1 for case sensitive comparison and press enter: 1
haha
hehe
hihi
```

Figure 1: Test 1

```
Number of strings in List 1: 3
Input String
haha
Input String
hehe
Input String
hihi
Number of strings in List 2: 2
Input String
haha
Input String
hehe
Type 0 to delete duplicates or 1 to not delete duplicates and press enter: 1
Type 0 for Case Insensitive or 1 for case sensitive comparison and press enter: 1
haha
haha
hehe
hehe
hihi
```

Figure 2: Test 2

```
Number of strings in List 1: 3
Input String
haha
Input String
hehe
Input String
hihi
Number of strings in List 2: 2
Input String
HAha
Input String
Hehe
Type 0 to delete duplicates or 1 to not delete duplicates and press enter: 0
Type 0 for Case Insensitive or 1 for case sensitive comparison and press enter: 1
HAha
Hehe
haha
hehe
hihi
```

Figure 3: Test 3

```
Number of strings in List 1: 3
Input String
haha
Input String
hehe
Input String
hihi
Number of strings in List 2: 2
Input String
Haha
Input String
HEHe
Type 0 to delete duplicates or 1 to not delete duplicates and press enter: 0
Type 0 for Case Insensitive or 1 for case sensitive comparison and press enter: 0
haha
hehe
hihi
```

Figure 4: Test 4

```
Number of strings in List 1: 3
Input String
haha
Input String
hehe
Input String
hihi
Number of strings in List 2: 2
Input String
HAha
Input String
Hehe
Type 0 to delete duplicates or 1 to not delete duplicates and press enter: 1
Type 0 for Case Insensitive or 1 for case sensitive comparison and press enter: 0
haha
HAha
hehe
Hehe
hihi
```

Figure 5: Test 5

```
Number of strings in List 1: 2
Input String
haha
Input String
hehe
Number of strings in List 2: 3
Input String
Haha
Input String
HEHE
Input String
Hihi
Type 0 to delete duplicates or 1 to not delete duplicates and press enter: 1
Type 0 for Case Insensitive or 1 for case sensitive comparison and press enter: 1
Haha
HEHE
Hihi
haha
hehe
```

Figure 6: Test 6