A1 PART3 2020CS10336

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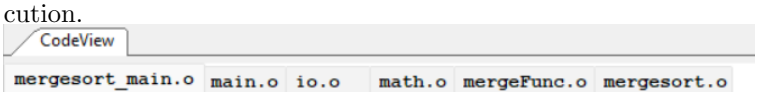
February 2022

How to run the program

Load the following files mergesort_main.s, mergesort.s, mergeFunc.s, math.s, io.s. The first file should be mergesort_main.s being the starting point of execution.



The execution starts from mergesort_main.s. It reads the length of the list followed by the strings in the list. After each string / length of list please press [ENTER]. Do not enter characters like space or backspace during input, my program does not handle these cases. This file also the reads the mode of comparison 0 (case insensitive) / 1 (case sensitive). The program then reads whether or not to remove duplicates 1(remove duplicates) / 0(do not remove duplicates). After pressing 1 or 0 please press [ENTER].
This file passes the control to the mergesort function, which expects the list address in r1, length of list in r2, mode of comparison in r3 and whether or not to remove duplicates in r4. After the end this function returns the address of the sorted list in r1, and the length of the sorted list in r2, which are used by the main file to print the answer.
The program is recursive, we divide the list into two half's, store the local variables on the stack and re-curse on both the half's. The sorted lists are merged by code written in mergeFunc.s, written in the previous assignment. This function expects an address to store the merged list, which is provided by the mergesort.s, at the end of the merge, this memory space is freed and the merged list is copied in place of the input string. Local variables are restored from the stack and the function call ends.
Note that the space used for storing the list, and the strings is defined at the end of the megesort_main.s It can be increased if needed and currently works for reasonable strings list lengths.

Some Examples

```
Please enter the length of the list, followed by the strings , one in each line
3
c
a
b
Enter the mode of comparison (0 (case insensitive) / 1 (case sensitive)): 1
Enter the 1(remove duplicates) / 0( don't remove duplicates): 1
The length of the sorted list: 3
The sorted list: a b c
```

```
Please enter the length of the list, followed by the strings , one in each line
7
Adafsf
ADAFSF
vafafdas
Vasdfa
aadfsd
gasdfas
asrtgasdf
Enter the mode of comparison (0 (case insensitive) / 1 (case sensitive)): 1
Enter the 1(remove duplicates) / 0( don't remove duplicates): 1
The length of the sorted list: 7
The sorted list: ADAFSF Adafsf Vasdfa aadfsd asrtgasdf gasdfas vafafdas
```

```
Please enter the length of the list, followed by the strings , one in each line
10
COL
col
Col
Computer
computers
Architecture
archTecture
ARMSim
ARMSIM
Chinmay
Enter the mode of comparison (0 (case insensitive) / 1 (case sensitive)): 0
Enter the 1(remove duplicates) / 0( don't remove duplicates): 1
The length of the sorted list: 7
The sorted list: Architecture archTecture ARMSim Chinmay COL Computer computers
```

```
Please enter the length of the list, followed by the strings , one in each line
10
aiew
pafjkshdklf
ladfjkl
dajdksf
bhkjlf
asdfjkl
majd
yadjkn
raldfjk
mkadhf
Enter the mode of comparison (0 (case insensitive) / 1 (case sensitive)): 0
Enter the 1(remove duplicates) / 0( don't remove duplicates): 0
The length of the sorted list: 10
The sorted list: aiew asdfjkl bhkjlf dajdksf ladfjkl majd mkadhf pafjkshdklf raldfjk yadjkn
```

```
Please enter the length of the list, followed by the strings , one in each line
8
ABC
HAadf
HAHA
haha
howdy
MoonLight
Thanos
ironmana
Enter the mode of comparison (0 (case insensitive) / 1 (case sensitive)): 1
Enter the 1(remove duplicates) / 0( don't remove duplicates): 0
The length of the sorted list: 8
The sorted list: ABC HAHA HAadf MoonLight Thanos haha howdy ironmana
```


Acknowledgements

The code in math.s and io.s is not mine, and is taken from Ramanuj Goel, I used the integer division functionality and io functionality to input and print integers. The functionality to read strings and list of strings, and print strings is mine and is included at the end of mergesort_main.s