CS 214 Systems Programming Spring 2017
Assignment 0 String Sorting
README File

Authors

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- Coded the sorting algorithm
- Wrote the readme.pdf file
- Wrote the testcases.txt file
- Commented code

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- Coded the input reading
- Coded conversion of inputs to a linked list
- Wrote the testcases.txt file
- Commented code

Brief Description

The purpose of this program is to read in a collection of strings composed of alphabetic characters that are separated by non-alphabetical characters, sort them into ascending alphabetical order, and output the sorted list. The inputs are read in as a single string, which is then tokenized based on whether subsequent characters are alphabetic or not. These tokenized strings are stored in an array and separated by '\0\' characters. From there the strings are one by one stored in a linked list of structs called node. The program checks through the linked list's current iteration to find the proper place to place the next string such that the list remains in ascending alphabetic order. After the sorted linked list has been fully created, the program returns to the top of the list and prints them all in alphabetical order. Lastly free calls are made to counter the malloc calls needed to create the list, and the program closes.

Features

- Since the sort searches sequentially for the proper place to insert the new string, it is an insertion sort algorithm, which would have $O(n^2)$ on average. However since we are inserting into a sorted list using a binary search, this means our time complexity winds up being nearer O(log(n)) on average.
- The linked list is formed through construction of a struct to represent the nodes. Each node holds a pointer to the beginning of its string, and a pointer to the address of the next node in the list.

Usage

To use the program, the input format must be as follows: any combination of characters, alphabetic or not, contained within quotations. A proper input will have alphabetic strings separated by a single non-alphabetic character, such as a space or a comma.