

Readme:

Data structures:

The data structures I used were 2 linked lists. The first linked list is called Node and holds the word, a pointer to the next Node and a pointer to the head of linked lists for files. I will call the amount of words N for the runtime. The second linked list is a list of files which holds an int for number of occurrences of the word in the file, the name of the file, and a pointer to the next file. This structure is called fileList and I will assume the number of files is M for runtime.

Analysis of runtime:

For the runtime, the program first searches through the file/directory that holds all of the words and puts it into the data structures node and fileList. The runtime for this is $(n * m)$. The program then runs through the list/words and puts them into a file, this takes a runtime of $(n * m)$. The program then frees the list which happens in constant runtime $O(1)$, so the total runtime of the program is $(n * m)^2$.