PA2
first.c

This file should briefly describe the main data structures being used in your program, a big O analysis of the run time and space requirements of your program in terms of the parameters k,m, and n (See the First Input/Output and Second Input/Output sections above), and any challenges that you encounter in this assignment.

The data structures being used in this program are fairly simple, two 2-D Character arrays and one node type structure. The complexity comes from the sorting and searching algorithms. The time complexity of my algorithm is $O(m^2logm) + O(k^2logk)$ worst case since I use binary search and insertion sort to enter each word into the 2D arrays for both data and dictionary files and the worst case would occur when each word must be inputted at the beginning of each 2D array. However, the average case would be $O(mlogm) + O(klogk)$. Those are the two most intensive processes in my program. Then I would run another binary search to see how many count and superwords there were for each given dictionary word. The space complexity of my program is a lot less which is at $O(n * k)$ since I only create one data structure of nodes to hold the results for each dictionary word and create two arrays for all the data. A challenge I encountered during this project was creating an efficient data structure to hold all the data given.