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Assignment 0: String Sorting

The purpose of this program is to read in a single input string, separate it into words (as marked by non-letter characters), and then print the words in alphabetical order.

Our code consists of three primary functions: countWords, splitAndShove, and sortItOut.

The purpose of countWords is to go through the input string and count the words. Each time there is a letter character preceding a non-letter character (this includes the terminating null character), we increase the count by 1. This prevents a string of all non-letter characters from being counted as a word. Then, we use this value to malloc an array of appropriate size called arrOfWords, which will later be sorted.

The purpose of splitAndShove is to take the words and put them into the array in the order they appear in the input string. By a process similar to countWords, when we find a letter character followed by a delimiting character, we go back to the first letter of the "word." Then, we create a new char array with size equal to the number of letters in the word, plus 1 extra space to hold the null character. Next, we copy each char in the "word" into this char array. After the loop, we add on the null character in the last spot in the char array. We put this newly created word in the next available spot in the arrOfWords. We continue this process until we reach the end of the input string.

The purpose of sortItOut is to sort the words in the arrOfWords. We use an insertion sort algorithm with a "sorted" and "unsorted" section. We sort each word one at a time from the unsorted section into the sorted section. The comparison of words is done by strcmp, which naturally gives uppercase letters priority over lowercase letters. This results in a sorted array with the words in alphabetical order.

Finally, we print out the words in the sorted list.