

Read - Complexity=  $O(1)$  A single while loop which reads in the data from the file, adding it to an arraylist. I doubt that this could be simplified any further, for obvious reasons.

Length - Complexity=  $O(1)$  A single line which adds a string to an array. Nothing that could be simplified

Uniques - Complexity=  $O(n^2 + n)$  A nested for loop which counts the unique string in an array, with another for loop which is used to calculate the spacing/syntax for the string to be added to the printing array. As for simplification, The loop used for syntax could be entirely removed, or be recalculated using a while loop which would have a lower complexity.

Sp - Complexity=  $O(n^2)$  Looping through a small array of words which are to be removed, inside of another loop which goes through the entire story array, the strings are checked to see if they match what needs to be removed. This could be easily simplified by having a few independent if statements, or even a switch statement to see if the string values are the same. This would remove the exponential factor of complexity.

Filewriter - Complexity=  $O(n)$  A for loop which goes through the print array, printing the index strings to the file that was created. This could potentially be simplified by using a while loop, and removing prior values from the array to shorten it and bring the while loop to a close, removing the  $n$  value for a 1 in complexity.