**ICS4U**

**Word Processing Assignment**

**Summary**

You’re given a textfile containing *unsorted* words from the English language. Using your skills in file processing, sorting, searching, and other algorithms, create a program that answers 4 of the 5 problems in Section A and 4 of the 5 problems in section B.

You may work in pairs; if you do, you must answer all 10 problems.

Each of the Section B problems will be tested 3 or 4 times.

**Section A**

Answers in this section should be printed in some logical order.

|  |  |
| --- | --- |
| All Vowels | Find all sets of 5 words that have each of the vowels in the same position. Example sets: MATE, METE, MITE, MOTE MUTE; BAT, BET, BIT, BOT, BUT. |
| Most Letters | Find the 26 words with the most of each of the letters of the alphabet.  Breaking ties part 1: If two words have the same number of a letter, the "better” answer is the shorter word. BUBBLE is better than BUBBLING.  Breaking ties part 2: If two words have the same number of a letter, and the same length, the word that doesn’t start with the letter is “better”. HUBBUB is better than BUBBLE. |
| Murica | List all the words that can be spelled using only the 2-letter shortcodes for the 50 American states. (AL, AK, AZ, AR, CA, CO, CT, …)  Example: VANDAL *(Virginia, North Dakota, Alabama).* |
| Backwards | List all words for which the reversed word is also a word, but *not* a palindrome.  Example: STRESSED |
| Odd/Even | List all words for which the odd/even letters make another word.  The “odd letters” are the 1st, 3rd, 5th, etc, and the “even letters” are the 2nd, 4th, 6th, …  Only words of 5+ letters (for odd) and 6+ letters (for even) should be considered, i.e. the resulting word must be 3+ letters.  Examples: DERBY (which makes *DRY*), UNBUNDLED (which makes *NUDE*) |

**Section B**

Answers in this section don't need to be printed in any specific order.

|  |  |
| --- | --- |
| Crossword Solver | Given a String parameter in the form “??E?R”, find all words that fit.  Example: “?R?EFA??”  ARTEFACT, FREEFALL  Example: “??A?M”  ALARM, CHARM, CHASM, PSALM, SWARM… |
| Minus One | Given a String parameter, list all words that can be made by removing a single letter, and keeping the remaining order intact.  The parameter doesn’t have to be a “word” from the original list.  Example: PLEASE  LEASE, PLEAS  Example: COOP  COP, COO (note that cop should not be repeated)  Example: APPLE  none |
| Plus One | The reverse of “minus one”; this should list all words that can be made by adding a single letter into any position.  Example: LATE  LATHE, LATER, LATTE, PLATE, ELATE, LATKE, … |
| Anagram | Given a String parameter, list all words that are anagrams.  Example: TSBEA  ABETS, BEAST, BEATS, BETAS, BATES, BASTE  Example: CANDLE  LANCED, CANDLE |
| Here or There | Here the parameters are a letter and 2 numbers.  Of words with at least n letters, does the letter appear more times at position k or position n? (0<k<n) These #s are 1-indexed not 0-indexed.  Example: Does the letter C appear more at position 2 or position 5? (only words with 5+ letters are considered in this example)  Words with ‘C’ at position 2 include ACROBAT and SCARED  Words with ‘C’ at position 5 include ATTIC and MUSICIANS  ICE is not counted because it doesn't have 5 or more letters. |

**Miscellaneous Requirements**

Write a menu so that I can test out the above 10 features with my own input, at my own leisure. After performing a feature, let me inspect the output, then return to the menu.

By default, use the englishwordlist.txt, but allow one of the menu options to let me choose a new word list! Your program should NOT assume that it is using the full English word list!

You must sort the data yourself, without using Arrays.sort or anything like that.

Make as many methods private as possible.

Java classes should be named after contributors. e.g. public class ZakAndSara

**Marks**

16T marks for solving various problems (i.e. they do what they're supposed to do)

1C mark for making all methods private, except the main menu

1C mark for a user friendly interface

8C marks for commenting

including big-oh notation for every method other than main. Use n to refer to the length of the word list, k for the length of a String, and you can use other letters if necessary. Example:

// O(k lg(n)) because for each letter in the word, perform a lg(n) search.

2A marks for using file I/O

4A marks for effective and efficient use of sort/search

4A marks for efficient use of appropriate data structures

2K making a menu

2K having the option to change the word list