

CS 122 – Lab #5 – ArrayList of Strings

Now that you know about Strings and ArrayLists, you are now ready to tackle problems that involve lots of words. Create a new directory in your account called lab05 and do all of today's work in there.

Before you begin coding, please download the file words2.txt from my Web site. You can copy the file directly from this location: `~chealy/www/words2.txt`. This is a list of words in the English language. In a sense, we can call this a dictionary of words. You will write a program that reads this list of words, and does some simple statistics. We are interested in knowing how many words exist of various lengths. And we are also interested in the number of vowels in each word.

When your program runs, it should create a report that has this precise format:

	3	4	5	6	7	8	9
0 vowels	12345	12345	12345	12345	12345	12345	12345
1 vowels	12345	12345	12345	12345	12345	12345	12345
2 vowels	12345	12345	12345	12345	12345	12345	12345
3 vowels	12345	12345	12345	12345	12345	12345	12345
4 vowels	12345	12345	12345	12345	12345	12345	12345
5 vowels	12345	12345	12345	12345	12345	12345	12345
6 vowels	12345	12345	12345	12345	12345	12345	12345
7 vowels	12345	12345	12345	12345	12345	12345	12345
8 vowels	12345	12345	12345	12345	12345	12345	12345
9 vowels	12345	12345	12345	12345	12345	12345	12345
Totals	12345	12345	12345	12345	12345	12345	12345

In the above table, the figure "12345" simply means that you should allocate enough space to print up to a 5-digit number, right justified. For the purpose of this program, we are only interested in words that have 3-9 letters.

I recommend that your program have the following structure:

Open the file words2.txt

Create a new ArrayList to hold all of the words of the input file.

Create a 2-d array of integers to hold the results to print in the table.

For each word in the input file:

If it is not 3-9 letters long, ignore it and go to the next word

Add the word to the ArrayList.

Count the vowels in this word.

Increment the appropriate cell in the array to tabulate this word according to length and # vowels.

Close the input file.

Now that the 2-d array has been calculated, create a 1-d array that shows just the distribution of words only according to their length. These numbers will be used at the bottom of the report.

Print the report.

When your program has printed the report, please show it to the instructor or lab aide to verify that the numbers are correct.

Based on your results, answer these questions:

What is the most likely number of vowels in a 9-letter word?

What is the most likely length of a word with 2 vowels?

What is the most common word length?

Part 2: User interaction with the list

Now that you have a list of all the words, allow the user to perform a query on them. Ask the user for a letter of the alphabet and a length. Traverse the list of words, printing out all words that begin with this letter and have the desired length. For example, the user might want to see all 5-letter words beginning with z.