**Lab 5\_3**

**SpellCheck Application**

For the SpellCheck application, various Collection classes can be used to store the dictionary of words – the words are read in from ‘words.txt’. It counts the number of misspelt words found in the text you are spell checking (alice30.txt ). A larger text file war-and-peace.txt is also given.

Use IntelliJ Profiler to generate % of time and actual time (in ms) for contains() method of your chosen Collection class – code as given uses a LinkedList.

Complete the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Structure used to store dictionary** | **% of Time for contains() method** | **Time in ms for contains() method** | **Big Oh for contains() method**  **n – size of the dictionary** |
| LinkedList | 60% | 8424ms | O(n) |
| HashSet | 1% | 168ms | O(1) |
| TreeSet | 1% | 156ms | O(log n) |
| ArrayList | 35% | 4924ms | O(n) |
|  |  |  |  |

Obtained with \_\_\_**11th Gen Intel(R) Core(TM) i7-1165G7**\_\_\_\_\_\_\_\_ processor, \_\_\_\_**2.80 GHz** \_\_\_\_\_ GHz, Java Version \_\_**17**\_, Windows 11 (or specify if not…)

Try different Collection classes and see the different values you will get for the contains() method. Use the larger text file if the smaller file give values that are too small.

What Collection class would you recommend for the SpellCheck application?

\_\_\_\_\_ HashSet \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain your answer \_\_\_\_ The contains() method in a HashSet has an average time complexity of O(1) . A HashSet inherently does not allow duplicate elements. Adding words to a HashSet is also efficient, making it suitable for initialising the dictionary quickly. A HashSet can dynamically resize if we add more words.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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