

## Programming Assignment 4

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Assignment Number: Programming Assignment 4

Assignment Title: Programming Assignment 4

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## Programming Assignment 4

### Abstract

#### Problem Description:

This program creates a spell checking “dictionary” then uses it to spell check a book. An array is created that consists of 26 elements. Thus the first Linked List element would contain only those words starting with letter 'a', while the last would contain only those words starting with the letter 'z'. This acts as the directory for all the words from A to Z. The program reads the “random\_dictionary” file, converts all the words to lower case then uses these words to populate all the words in the dictionary from A to Z.

The Oliver book is then read one word at a time. As each word is read, it is converted to lower case then ran through an algorithm to ensure it is a word containing only the letters a-z. Another algorithm is then used to select the first character of this word then compare it to the words in the dictionary based on the words available in the dictionary starting with that letter. If that word is not found, it is either misspelled, or not in the dictionary. It is then counted as a word not found. If the word is found, it is counted as a word found.

The program also counts the number of string comparisons that are done during search using two counters. One is for the number of comparisons for words that were found in the dictionary, and the other is for the number of comparisons for words that were not found in the dictionary. For example, if the word is “apple” and “apple is a word in the dictionary, the counter for words found will be incremented. Similarly, if the word “apple” is not found in the dictionary then that counter would be incremented.

At the end, the program computes and displays the average number of string comparisons for words that were found and the words that were not found.

## Programming Assignment 4

```
/**  
 * C202 Assignment 4  
 * TestLinkedList.java  
 * Purpose: This program creates a spell checking “dictionary” then uses it to  
 * spell check a book.  
 *  
 * @author Dewey Kincheloe  
 * @version 1.0 10/25/2016  
 */
```

```
import java.util.*;  
import java.io.*;  
import java.lang.*;
```

```
/**  
 * The TestLinkedList class is used to control program execution for the  
 * MyAbstractList and MyLinkedList classes.  
 *  
 */
```

```
public class TestLinkedList  
{
```

```
/**  
 * The removeSpecials method receives a word from the oliver text file and  
 * removes all special characters thus ensuring it is only composed of the  
 * letters a-z. If it is a word composed entirely of special characters, it is  
 * converted to an x so it will still count as a word to be checked.  
 *  
 */
```

## Programming Assignment 4

```
public String removeSpecials(String word)
{
    String cleanWord = "";
    for (int i=0;i<word.length();i++)
    {
        //Ascci range for a-z 97-122
        if (word.charAt(i)>96&&word.charAt(i)<123)
        {
            cleanWord += word.charAt(i);
        }
    }
    if (cleanWord == "")
        cleanWord = "x";
    return cleanWord;
}
```

```
/**
```

```
* The main method controls program execution.
```

```
*
```

```
*/
```

```
public static void main(String[] args)
{
    TestLinkedList obj = new TestLinkedList();
    float wordsFound = 0;
    float wordsNotFound = 0;
    float compsFound = 0;
    float compsNotFound = 0;
    // Create a list for Linked Lists
    MyLinkedList[] list = new MyLinkedList[26];
    for(int i = 0; i< list.length; i++)
```

## Programming Assignment 4

```
{  
    list[i] = new MyLinkedList<String>();  
}
```

```
File f = new File ("random_dictionary.txt");  
String inputWord;  
try{  
    Scanner in = new Scanner(f);  
    while ( in.hasNext())  
    {  
        inputWord = in.next();  
        inputWord = inputWord.toLowerCase();  
        int i = (inputWord.charAt(0)-97);  
        list[i].addLast(inputWord);  
    }  
    System.out. println("Processing complete");  
    in.close();  
}  
catch(IOException e)  
{  
    System.out.println("Unable to read file");  
}
```

```
File book = new File ("oliver.txt");
```

```
try{  
    Scanner in = new Scanner(book);  
    while ( in.hasNext())  
    {  
        inputWord = in.next();
```

## Programming Assignment 4

```
inputWord = inputWord.toLowerCase();
inputWord = obj.removeSpecials(inputWord);
int i = (inputWord.charAt(0)-97);

int[] count = new int[1];
count[0] = 0;
if (list[i].contains(inputWord, count))
{
    wordsFound++;
    compsFound += count[0];
}
else
{
    wordsNotFound++;
    compsNotFound += count[0];
}

System.out. println("Processing complete");
in.close();
}
catch(IOException e)
{
    System.out.println("Unable to read file");
}

System.out.println("wordsfound " + wordsFound);
System.out.println("wordsnotfound " + wordsNotFound);
System.out.println("compsfound " + compsFound);
System.out.println("compsnotfound " + compsNotFound);
double avgcompswordsfound = (double) compsFound / wordsFound;
```

## Programming Assignment 4

```
System.out.println("avgcompswordsfound " + avgcompswordsfound);  
double avgcompswordsnotfound = (double) compsNotFound / wordsNotFound;  
System.out.println("avgcompswordsnotfound " + avgcompswordsnotfound);  
}  
  
}
```

### Outputs

run:

Processing complete

Processing complete

wordsfound 914054.0

wordsnotfound 67937.0

compsfound 3.24732544E9

compsnotfound 4.7987184E8

avgcompswordsfound 3552.662577922092

avgcompswordsnotfound 7063.482932717076

BUILD SUCCESSFUL (total time: 5 minutes 14 seconds)