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/* SELF ASSESSMENT
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1. readDictionary
- I have the correct method definition [Mark out of 5:5]
- Comment: My method definition was correct.
- My method reads the words from the "words.txt" file. [Mark out of 5:5]
- Comment: It reads from the word.txt file.
- It returns the contents from "words.txt" in a String array or an ArrayList. [Mark out of 5:5]
- Comment: Reads it to an String Array

2. readWordList
- I have the correct method definition [Mark out of 5:5]
- Comment: I used the correct method definition.
- My method reads the words provided (which are separated by commas, saves them to an array or ArrayList of String references and returns it.
[Mark out of 5:5]
- Comment: It reads the words given and seperated them by commas and then saves them to an String Array.

3. isUniqueList
- I have the correct method definition [Mark out of 5:5]
- Comment: I used the correct method definition.
- My method compares each word in the array with the rest of the words in the list. [Mark out of 5:5]
- Comment: My method does the above.
- Exits the loop when a non-unique word is found. [Mark out of 5:5]
- Comment: If this hapeens it will return false.
- Returns true is all the words are unique and false otherwise. [Mark out of 5:5]
- Comment: My method does the above.

4. isEnglishWord
- I have the correct method definition [Mark out of 5:5]
- Comment: I used the correct method defintion.
- My method uses the binarySearch method in Arrays library class. [Mark out of 3:3]
- Comment: My method does the above.
- Returns true if the binarySearch method return a value >= 0, otherwise false is returned. [Mark out of 2:2]
- Comment: It does the above succesfully.

5. isDifferentByOne
- I have the correct method definition [Mark out of 5:5]
- Comment: I used the correct method definition.
- My method loops through the length of a words comparing characters at the same position in both words searching for one difference. [Mark
out of 10:10]
- Comment: My method does the above.

6. isWordChain
- I have the correct method definition [Mark out of 5:5]
- Comment: I used the correct method definition.
- My method calls isUniqueList, isEnglishWord and isDifferentByOne methods and prints the appropriate message [Mark out of 10:10]
- Comment: My method calls all of the above and prints the appropriate message.

7. main
- Reads all the words from file words.txt into an array or an ArrayList using the any of teh Java.IO classes covered in lectures [Mark out of
10:10]
- Comment: My mains does the above.
- Asks the user for input and calls isWordChain [Mark out of 5:5]
- Comment: Does the above.

Total Mark out of 100 (Add all the previous marks):100
*/
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```
import java.util.Scanner;
import java.util.ArrayList;
import java.util.Locale;
import java.io.*;
import java.util.Arrays;

public class LewisCarrolsWordLinksPuzzleGame {

    public static String[] readDictionary()
    {
        String[] dictionaryOfWords = new String[658964];
        try {
            FileReader fileReader = new FileReader("words.txt");
            BufferedReader bufferedReader = new BufferedReader(fileReader);
            String reader;
            int i = 0;
            while((reader = bufferedReader.readLine()) != null) {
                dictionaryOfWords[i] = reader;
                i += 1;
            }
            bufferedReader.close();
            fileReader.close();
        }catch (FileNotFoundException e) {
            e.printStackTrace();
        }catch (IOException e) {
            e.printStackTrace();
        }
        return dictionaryOfWords;
    }
}
```

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}

public static String[] readWordList(String userInput)
{
    String[] listOfInputWords = userInput.split(",");

    return listOfInputWords;
}

public static boolean isUniqueList(String[] listOfInputWords)
{
    boolean allUnique = true;
    for(int count1 = 0; count1<listOfInputWords.length;count1++)
    {
        for(int count2 = 0;count2<listOfInputWords.length;count2++)
        {
            if(count1!=count2)
            {
                if(listOfInputWords[count1]==listOfInputWords[count2]) allUnique=false;
            }
        }
    }
    return allUnique;
}

public static boolean isEnglishWord(String word, String[] dictionaryOfWords)
{
    if (Arrays.binarySearch(dictionaryOfWords, word) > 0)
    {
        return true;
    }
    return false;
}

public static boolean isDifferentByOne(String[] listOfInputWords)
{
    for(int count = 0; count < listOfInputWords.length - 1; count++)
    {
        int numberOfDifferences=0;
        char[] firstArray = listOfInputWords[count].toCharArray();
        char[] secondArray = listOfInputWords[count+1].toCharArray();
        if(firstArray.length==secondArray.length)
        {
            for(int counter =0;counter<firstArray.length;counter++)
            {
                if(firstArray[counter]!=secondArray[counter]) numberOfDifferences++;
            }
            if(numberOfDifferences!=1) return false;
        }
        else
        {
            return false;
        }
    }
    return true;
}

public static boolean isWordChain(String[] listOfInputWords, String[] dictionaryOfWords)
{
    boolean isUniqueList = isUniqueList(listOfInputWords);
    if(isUniqueList)
    {
        boolean isDiffrentByOne = isDifferentByOne(listOfInputWords);
        if(isDiffrentByOne)
        {
            for(int count = 0;count<listOfInputWords.length; count++)
            {
                String word = listOfInputWords[count];
                boolean isEnglishWord = isEnglishWord(word, dictionaryOfWords);
                if(!isEnglishWord) return false;
            }
            return true;
        }
    }
    return false;
}

public static void main(String[] args) {

    Scanner input = new Scanner( System.in );

    boolean finished = false;
    String[] dictionaryOfWords = readDictionary();
    while(!finished)
    {
        System.out.println("Enter a comma separated list of words (or an empty list to quit):\n");
    }
}

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```
String userInput = input.next();
if(!userInput.equals(""))
{
    String[] listOfInputWords = readWordList(userInput);
    boolean isWordChain = isWordChain(listOfInputWords, dictionaryOfWords);
    if(isWordChain) System.out.println("\n\nValid chain of words from Lewis Carroll's word-links game.\n");
    else System.out.println("\n\nNot a valid chain of words from Lewis Carroll's word-links game.\n");
}
else
{
    finished=true;
}
}
System.out.println("Quit Program Succesful.");
input.close();
}
```

}