CSCI 301 Computer Science II Summer 2023

Assignment 4 – Spell Checker

Due Date: 11:50 pm on July 11, Tuesday

# Introduction

In this project, we have built a spell check program. The program compares the words saved previously in a file called dictionary with words that are in a newly inputted file and lists all the incorrectly spelled words. The program displays only the mismatched words from the dictionary. However, the word should exist in the dictionary otherwise, the spelling program won’t be able to work. We used a bag to serve as a dictionary to save the collection of the correctly spelled words.

# Data Structures

This is C++ program that implements a spell checker using a doubly-linked bag as a dictionary and node class. It reads words from an external file and checks if each word is spelled correctly based on the words in the dictionary. The program requests a file from the user and converts it to a string. It opens it and compares the words it contains with the words in the dictionary. After the comparison of words the program closes the inputted file at the end of the program.

# Functions

* We have the function that read words from the dictionary file and populate the dictionary Bag
* The function that prompts the user to enter the name of the file containing words to be checked and opens the file.
* The function that checks each word from the input file against the dictionary and displays the misspelled words in a list by indicating the name of the file where the words are coming from.

# Structure chart of the main program



# Code list:

/\*\*

\* problem description: this program about dictionary check. It reads a word in an inputed file from the user

\* and compares it with the saved disctionary and display the list of the misspelled words.

\* Name: Algassimou Diallo

\* startID: el8524jv

\* Instructor: Jie Meichsner

\* Due date: 07/11/2023

\*/

#ifndef LINKEDBAG\_H

using namespace std;

/\*\*

\* This class represents a Bag implemented using a doubly-linked list.

\* It stores a collection of words as the dictionary.

\*/

class Dictionary {

private:

class Node {

public:

string data;

Node\* prev;

Node\* next;

Node(const string& value) : data(value), prev(nullptr), next(nullptr) {}

};

Node\* first;

int size;

public:

Dictionary() : first(nullptr), size(0) {}

/\*\*

\* Adds a new word to the dictionary.

\* @param word The word to add.

\*/

void addWord(const string& word) {

Node\* newNode = new Node(word);

if (isEmpty()) {

first = newNode;

} else {

newNode->next = first;

first->prev = newNode;

first = newNode;

}

size++;

}

/\*\*

\* Checks if a word is contained in the dictionary.

\* @param word The word to check.

\* @return True if the word is in the dictionary, false otherwise.

\*/

bool contains(const string& word) const {

Node\* current = first;

while (current != nullptr) {

if (current->data == word) {

return true;

}

current = current->next;

}

return false;

}

/\*\*

\* Checks if the dictionary is empty.

\* @return True if the dictionary is empty, false otherwise.

\*/

bool isEmpty() const {

return size == 0;

}

};

#endif

/\*\*

\* problem description: this program about dictionary check. It reads a word in an inputed file from the user

\* and compares it with the saved disctionary and display the list of the misspelled words.

\* Name: Algassimou Diallo

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\*/

#include <iostream>

#include <fstream>

#include <string>

#include <unordered\_set>

#include "dictionaryBag.h"

using namespace std;

int main() {

Dictionary dictionary;

// Read words from the dictionary file and populate the dictionary Bag

ifstream dictFile("/Volumes/academic/project4/dictionary.txt");

if (!dictFile.is\_open()) {

cout << "Unable to open dictionary file." << endl;

return 1;

}

string word;

while (dictFile >> word) {

dictionary.addWord(word);

}

dictFile.close();

// // Prompt the user to enter the name of the file containing words to be checked

//------------------------------------------------------------------------------------------

cout << "Enter the path of the file that contains words to be check: ";

string filename;

cin >> filename;

ifstream inputFile(filename);

if (!inputFile.is\_open()) {

cout << "Unable to open file: " << filename << endl;

return 1;

}

string checkWord;

unordered\_set<string> misspelledWords;

// Check each word from the input file against the dictionary

while (inputFile >> checkWord) {

if (!dictionary.contains(checkWord)) {

misspelledWords.insert(checkWord);

}

}

inputFile.close();

if (misspelledWords.empty()) {

cout << "No misspelled words found." << endl;

} else {

cout << "The following words in the file \"" << filename << "\" are not spelled correctly:" << endl;

for (const string& misspelledWord : misspelledWords) {

cout << misspelledWord << endl;

}

}

cout << "Thanks for using the spell checker system." << endl;

return 0;

}

# User Document

In this program, the Dictionary class represents a bag implemented using a doubly-linked list. It stores a collection of correctly spelled words. The main function reads words from a dictionary file and populates the dictionary bag. It then prompts the user to enter the name of the file containing words to be checked. Each word from the input file is checked against the dictionary to determine if it is spelled correctly. Finally, the program outputs the misspelled words, if any. The dictionary file called “disctionary.txt” has been already created and embedded in the project. However, it can always be modified by adding or removing words.

When entering the file to be checked, the user will have to create the file separately and enter the whole path of the file from the user prompt otherwise the program won’t be able to open the file.

The file of this project is located in the centOS folder: el8524jv/csci301/project4

To compile this program please run the command: g++ doubleLinkedBag.h spelling.cpp then ./a.out

# Test cases

| tests | inputs | outputs |
| --- | --- | --- |
| 1. No misspelled words in inputted file | Dictionary.txt [Cat  Dog  Car  bottle  chocolate  ]  Words.txt [Car  Dog  chocolate  ] | No misspelled words found.  Thanks for using the spell checker system |
| 1. three incorrectly spelled words in the file | Dictionary.txt [Cat  Dog  Car  bottle  chocolate  ]  Words.txt [Car  Dgo  chocolte  blotte  ] | The following words in the file "/Volumes/academic/project4/words.txt" are not spelled correctly:  blotte  chocolte  Dgo  Thanks for using the spell checker system. |
| 1. The inputted file has no existing words in the dictionary file | Dictionary.txt [Cat  Dog  Car  bottle  chocolate  ]  Words.txt [  computer  laptop  water  keyboard  ] | The following words in the file "/Volumes/academic/project4/words.txt" are not spelled correctly:  keyboard  water  laptop  Computer  Thanks for using the spell checker system. |
| 1. the inputted file is empty | Dictionary.txt [Cat  Dog  Car  bottle  chocolate  ]  Words.txt [ ] | No misspelled words found. |
| 1. the dictionary file is empty | Dictionary.txt [ ]  Words.txt [  computer  laptop  water  keyboard  ] | The following words in the file "/Volumes/academic/project4/words.txt" are not spelled correctly:  keyboard  water  laptop  Computer  Thanks for using the spell checker system. |

# Test scripts:

The following scripts represent the tests that have indicated in the table above.

* Test1

Script started on Tue Jul 11 20:54:19 2023

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004hccd "/Volumes/academic/project4/output"[?2004l

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h../"spelling"[?2004l

Enter the path of the file that contains words to be checked: /Volumes/academic/project4/words.txt

No misspelled words found.

Thanks for using the spell checker system.

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h[?2004l

Script done on Tue Jul 11 20:55:05 2023

* Test2

Script started on Tue Jul 11 21:00:19 2023

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004hccd "/Volumes/academic/project4/output"[?2004l

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h../"spelling"[?2004l

Enter the path of the file that contains words to be checked: /Volumes/academic/project4/words.txt

The following words in the file "/Volumes/academic/project4/words.txt" are not spelled correctly:

blotte

chocolte

Dgo

Thanks for using the spell checker system.

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h[?2004l

Script done on Tue Jul 11 21:00:47 2023

* Test3

Script started on Tue Jul 11 21:02:21 2023

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004hccd "/Volumes/academic/project4/output"[?2004l

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h../"spelling"[?2004l

Enter the path of the file that contains words to be checked: /Volumes/academic/project4/words.txt

The following words in the file "/Volumes/academic/project4/words.txt" are not spelled correctly:

keyboard

water

laptop

computer

Thanks for using the spell checker system.

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h∂ [?2004l

Script done on Tue Jul 11 21:03:04 2023

* Test4

Script started on Tue Jul 11 21:04:24 2023

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004hccd "/Volumes/academic/project4/output"[?2004l

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h../"spelling"[?2004l

Enter the path of the file that contains words to be checked: /Volumes/academic/project4/words.txt

No misspelled words found.

Thanks for using the spell checker system.

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h[?2004l

Script done on Tue Jul 11 21:04:54 2023

* Test5

Script started on Tue Jul 11 21:05:54 2023

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004hccd "/Volumes/academic/project4/output"[?2004l

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h../"spelling"[?2004l

Enter the path of the file that contains words to be checked: /Volumes/academic/project4/words.txt

The following words in the file "/Volumes/academic/project4/words.txt" are not spelled correctly:

keyboard

water

laptop

computer

Thanks for using the spell checker system.

[1m[7m%[27m[1m[0m

[0m[27m[24m[Jalgassimou@Algassimous-MacBook-Pro output % [K[?2004h[?2004l

Script done on Tue Jul 11 21:06:22 2023

# Summary

The project was built and tested on my local computer using the editor VScode first before moving to SCSU CentOS. We have registered no failure locally, all the tests were successful. However, we had a few setbacks during the program implementation. The first issue was related to the input file that contains the words to be checked. Our first intention was to integrate the file in the program just by adding the file inputted by the user. However, the system required the full path of the file in order to be able to open it. The second issue that we came across was that the program is failing in centOS due to compiling version differences. I was prompt the following error when I try to run the program on centOS:

[el8524jv@csci4 project4]$ g++ spelling.cpp doubleLinkedBag.h

In file included from /usr/include/c++/4.8.2/unordered\_set:35:0,

from spelling.cpp:13:

/usr/include/c++/4.8.2/bits/c++0x\_warning.h:32:2: error: #error This file requires compiler and library support for the ISO C++ 2011 standard. This support is currently experimental, and must be enabled with the -std=c++11 or -std=gnu++11 compiler options.

We spent a lot of time figuring out how to solve this bug but time didn’t permit us to overcome this.