CSN – 261: DATA STRUCTURES LABORATORY

Lab Assignment 4

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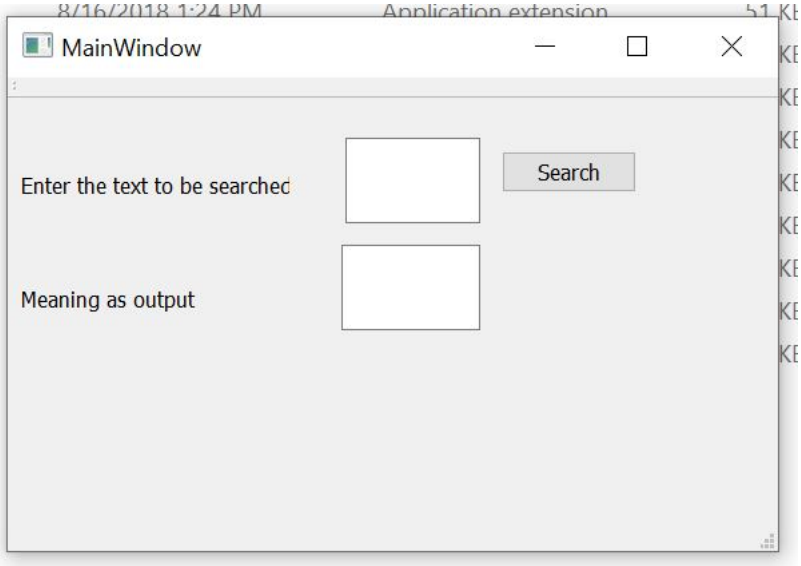
Problem Statement 1: Create a dictionary using Trie data structure (without using STL) having words and their meanings. You need to read the words and their respective meanings from a CSV file (uploaded in Piazza, named as TrieInput.csv), where 1st column is for words and 2nd column shows its meaning.Given a word you have to print its meaning. If no such word is found in the dictionary, then print “Invalid word”. Create a GUI using Qt library to accept a word in a text box and display the meaning in an anotherbox, as shown in the Figure 1.Also,create an installer of your program for Windows OS. You can use the software like InstallSimple or InstallShield or WIX or NSIS to do so.

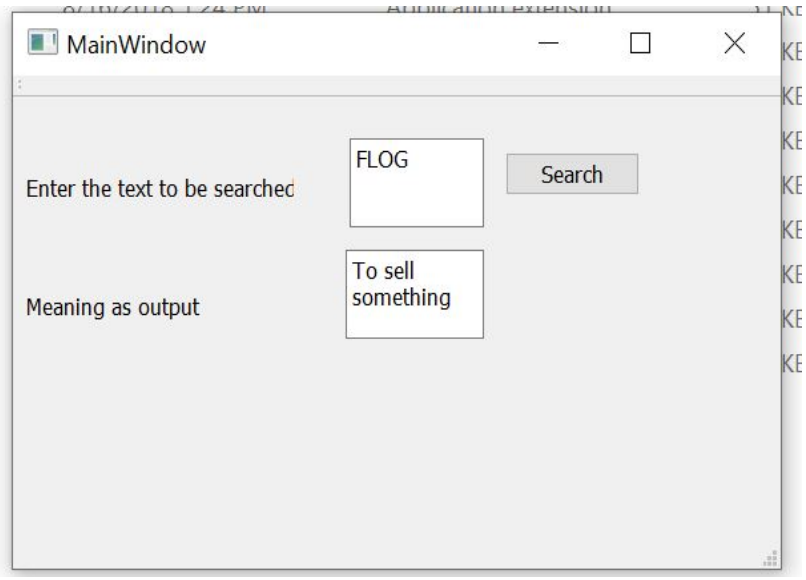
The Main Data Structures used include: -

- Trie Data Structure
- Arrays
- Struct
- Unordered map

The Algorithms used include: -

- Insertion in Unordered Map
- Find in Unordered Map
- Use of fopen() and fclose()





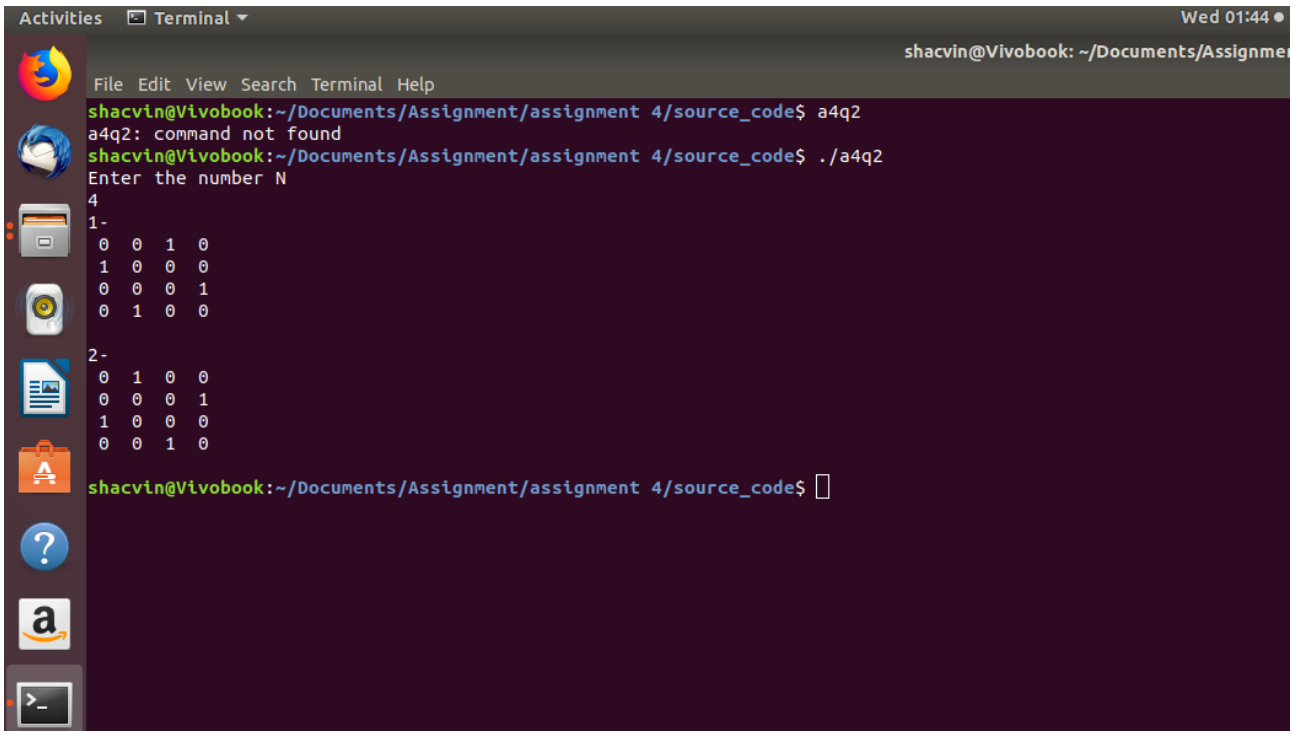
Problem Statement 2: Implement N Queens problem to show all the possible combinations inN x Nbinary matrix and to display the total number of such combinations at the end, where 1 represents the position of N queens in theN x N matrix and remaining cells are represented by 0.

The Main Data Structures used include: -

- Array

The Algorithms used include: -

- Backtracking



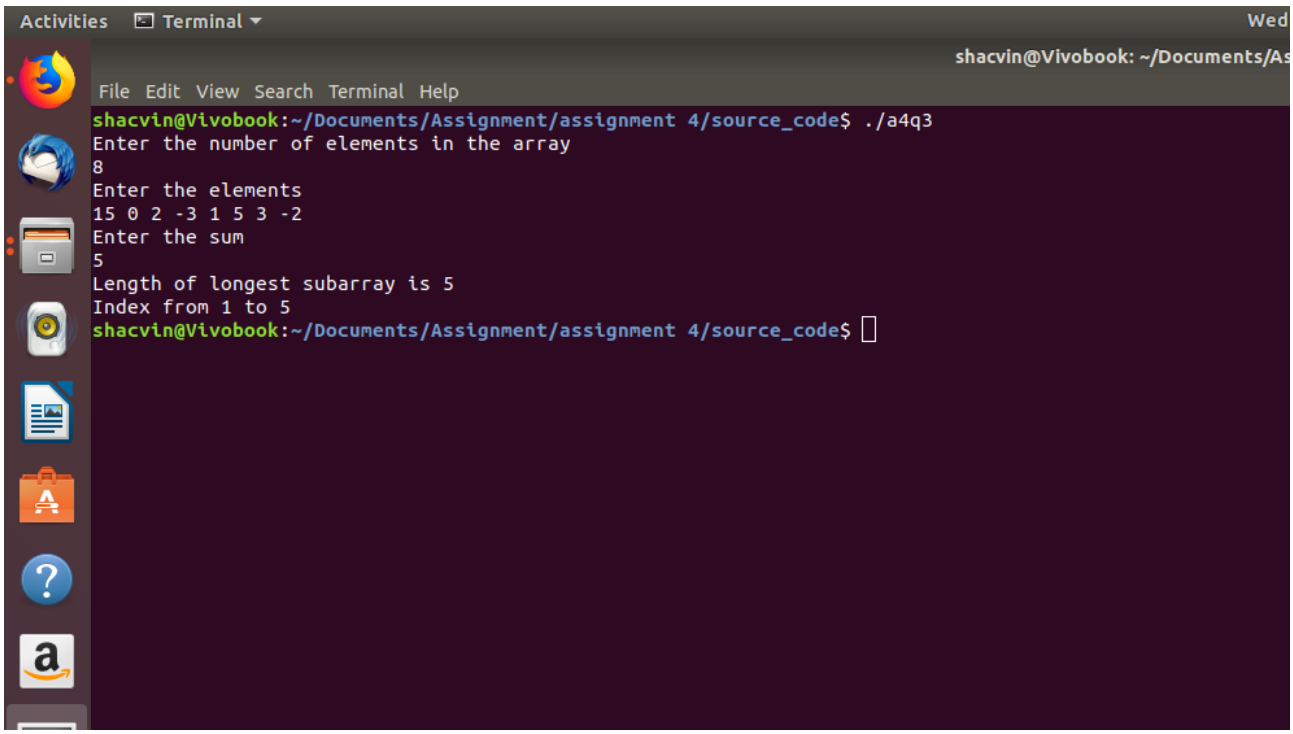
Problem Statement 3: Given an integer array having N number of elements, write a C++ programusing hash map (using STL) to find the length of the largest subarray from the given input array, where thesummation of the elements of the subarray is equal to n. In the output, if any solution exists then print the starting and ending index (with respect to given input array) of the largest subarray and also print its length. Otherwise, print “Not Found”, as described in the following output. Input:N = 8 15 0 2 -3 1 5 3 -2 n = 5 Output:Length of longest subarray is 5 Index from 1 to 5.

The Main Data Structures used include: -

- Unordered map
- Array

The Algorithms used include: -

- Hashing


Activities
Terminal
Wed
shacvin@Vivobook: ~/Documents/As
File Edit View Search Terminal Help
shacvin@Vivobook:~/Documents/Assignment/assignment 4/source_code$ ./a4q3
Enter the number of elements in the array
8
Enter the elements
15 0 2 -3 1 5 3 -2
Enter the sum
5
Length of longest subarray is 5
Index from 1 to 5
shacvin@Vivobook:~/Documents/Assignment/assignment 4/source_code$