JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY
NOIDA

Search Engine Using Maps and Trie

Data Structures Lab Project

B. Tech , Computer science

2nd Year (2018-2019)

Made By:

Batch B14

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Submitted To:

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Introduction:

Search Engine Project in C++ is an academic search engine application designed to search relevant academic information and records in schools, colleges and universities. It supports two popular search engines: Google Scholar and Microsoft Academic Search. With this application, students in colleges and universities can search academic information based on the keywords and titles provided for search.

The coding of this project is done in C++ language. Most academic institutions, colleges and universities, have their own websites that provide information regarding students' research papers, project source codes and project reports. These records can be used as a reference by new students entering the colleges and universities. This search engine provides a platform to find out such records, information and data that can help students in the academic works.

Major Data Structure Used:

- TRIE
- MultiMaps

Functions Used:

- Insert in TRIE

```
void insert(struct TrieNode *root,  string key)
{
    struct TrieNode *pCrawl = root;

    for (int level = 0; level < key.length(); level++)
    {
        int index = CHAR_TO_INDEX(key[level]);
        if (!pCrawl->children[index])
        pCrawl->children[index] = getNode();
        pCrawl = pCrawl->children[index];
    }
    pCrawl->isWordEnd = true;
}
```

- Search in TRIE

```
bool search(struct TrieNode *root, const string key)
{
    int length = key.length();
    struct TrieNode *pCrawl = root;
    for (int level = 0; level < length; level++)
    {
        int index = CHAR_TO_INDEX(key[level]);
        if (!pCrawl->children[index])
            return false;
        prefix += key[level];
        pCrawl = pCrawl->children[index];
    }
    return (pCrawl != NULL && pCrawl->isWordEnd);
}
```

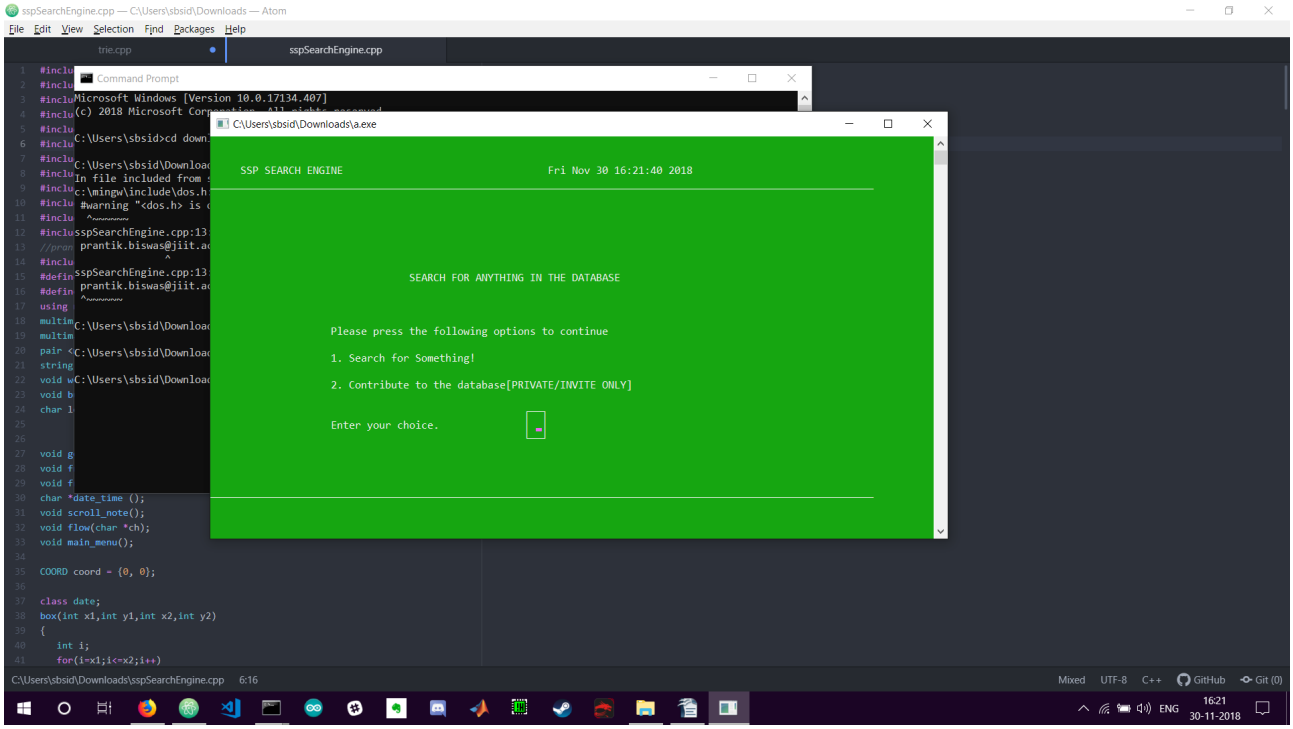
- Auto Complete Word Suggestions

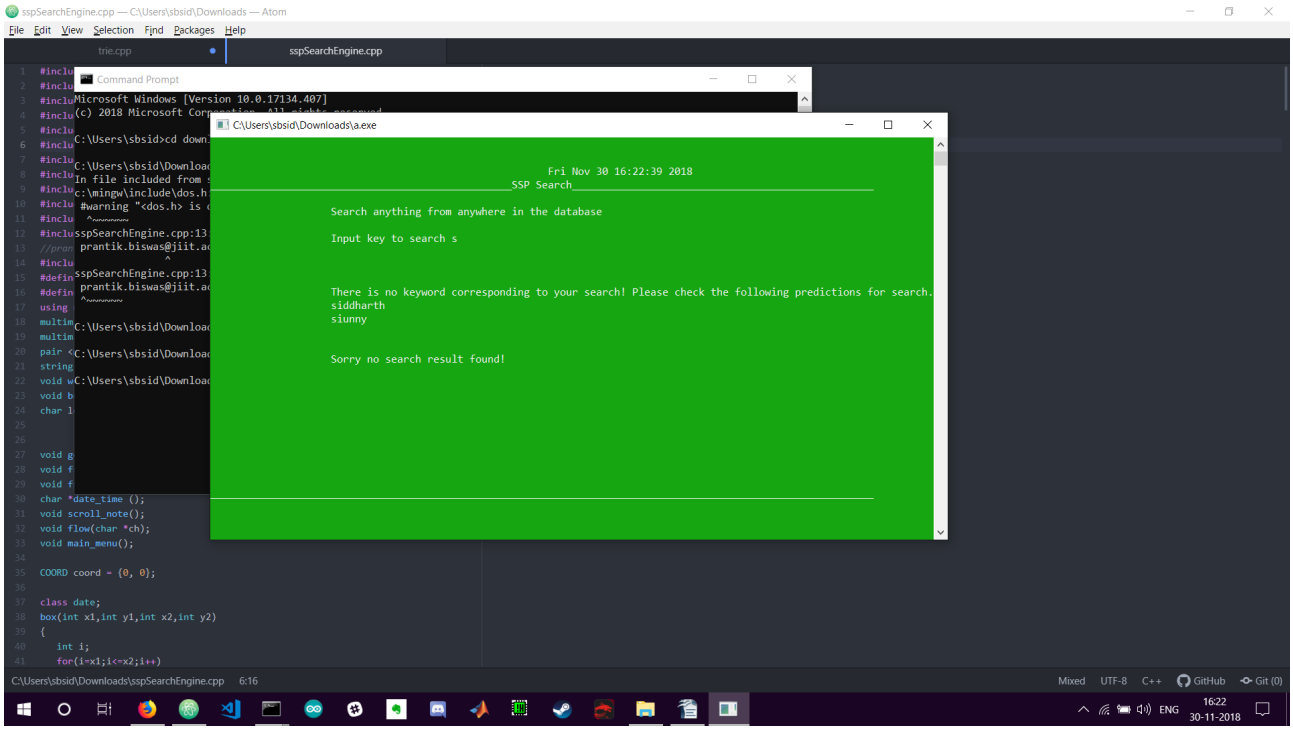
```
void suggestionsRec(struct TrieNode* root, string currPrefix)
{
    if (root->isWordEnd)
    {
        gotoxy(20,pos++);
        cout << currPrefix;
        cout << endl;
    }
    if (isLastNode(root))
        return;

     for (int i = 0; i < ALPHABET_SIZE; i++)
    {
        if (root->children[i])
        {
```

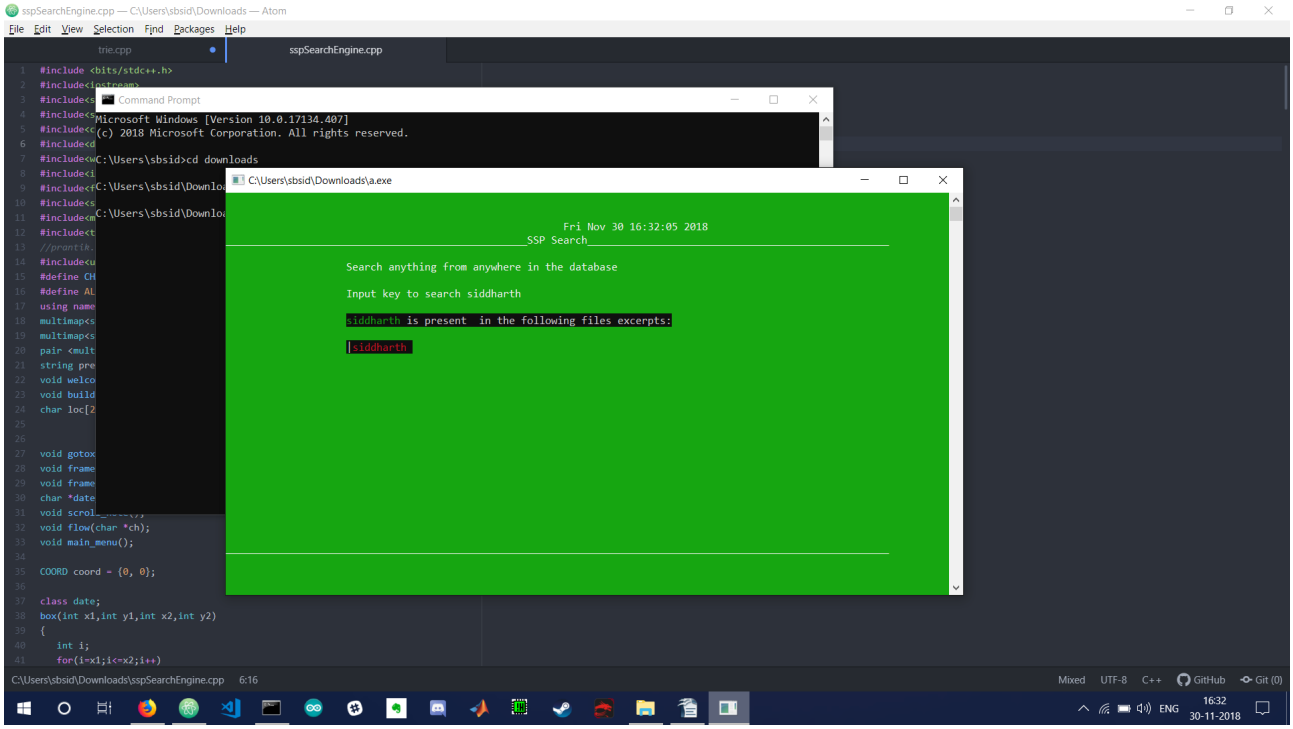
```
                currPrefix.push_back(97 + i);
                suggestionsRec(root->children[i], currPrefix);
            }
        }
}
int printAutoSuggestions(TrieNode* root, const string query)
{
        struct TrieNode* pCrawl = root;
        int level;
        int n = query.length();
        for (level = 0; level < n; level++)
        {
            int index = CHAR_TO_INDEX(query[level]);
            if (!pCrawl->children[index]){
            prefix="";
            return 0;
            }
        pCrawl = pCrawl->children[index];
        }
        bool isWord = (pCrawl->isWordEnd == true);
        bool isLast = isLastNode(pCrawl);
        if (isWord && isLast)
        {
            gotoxy(20,12);
            cout << query << endl;
            prefix="";
            return -1;
        }
        if (!isLast)
        {
            string prefix1 = query;
            suggestionsRec(pCrawl, prefix1);
```

```
                    prefix="";
                    return 1;
                }
            }
```

ScreenShots:



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Command Prompt
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(c) 2018 Microsoft Corporation. All rights reserved.
C:\Users\sbsid>cd downloads
C:\Users\sbsid\Downloads\a.exe
Fri Nov 30 16:32:05 2018
SSP Search
Search anything from anywhere in the database
Input key to search siddharth
siddharth is present in the following files excerpts:
siddharth
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16:32
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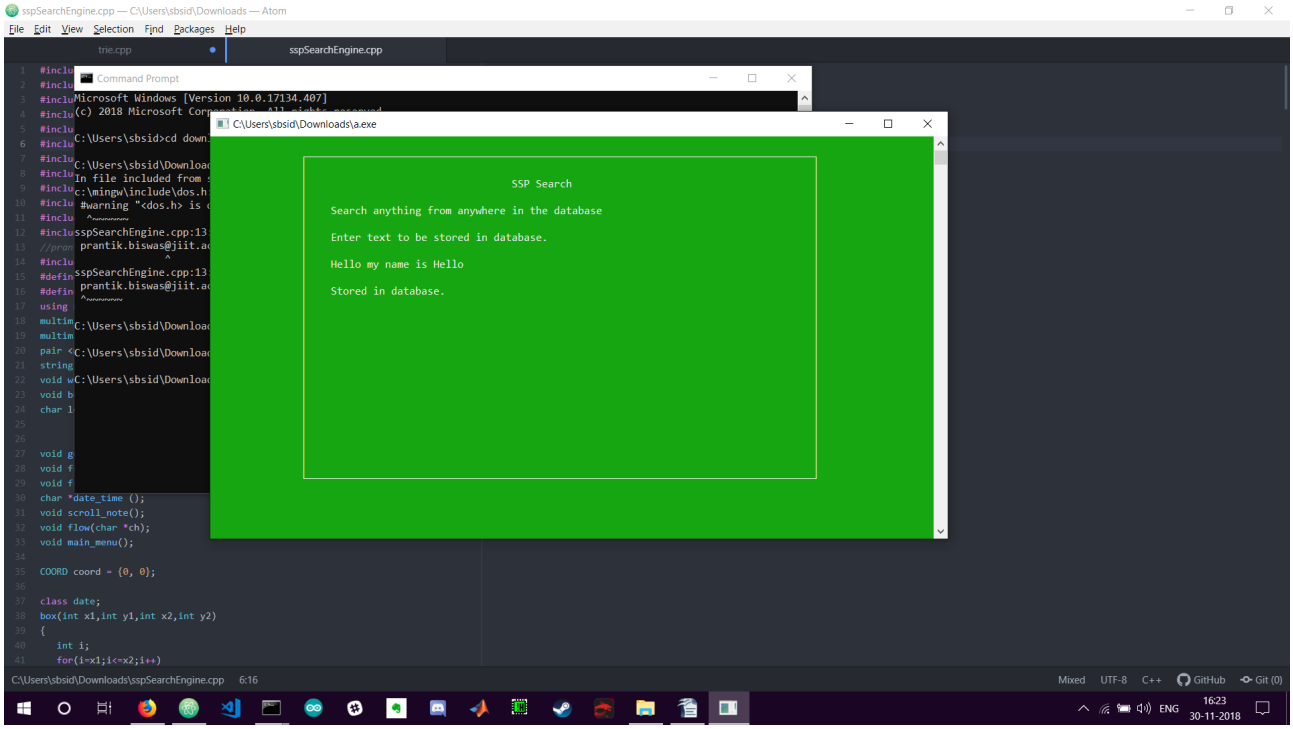
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trie.cpp
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Command Prompt
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SSP Search
Search anything from anywhere in the database
Enter text to be stored in database.
Hello my name is Hello
Stored in database.
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