Library Management System

Data Structure Project Proposal

Submitted to Mrs Rajni Jindal

Submitted by
Akhilesh Kr. Verma
2K19/CO/040
Abhishek Soren
2K19/CO/025

Aim :

To create a virtual Library Management System and access all the information relating to the book present in the shelf using TRIE TREE Data Structure.

Introduction :

In computer science, a trie, also called digital tree or prefix tree, is a kind of search tree—an ordered tree data structure used to store a dynamic set or associative array where the keys are usually strings. All the descendants of a node have a common prefix of the string associated with that node, and the root is associated with the empty string.

Motivation :

Some advantages of TRIE :

- With Trie, we can insert and find strings in O(L) time where L represent the length of a single word. This is obviously faster than BST. This is also faster than Hashing because of the ways it is implemented. We do not need to compute any hash function. No collision handling is required (like we do in open addressing and separate chaining)
- We can easily print all words in alphabetical order which is not easily possible with hashing.
- We can efficiently do prefix search (or auto-complete) with Trie.

As TRIE has the above advantages over other data structures we have preferred using TRIE over them.

TRIE :

- Insertion proceeds by walking the trie according to the string to be inserted, then appending new nodes for the suffix of the string that is not contained in the trie.

- Searching also proceeds the similar way by walking the trie according to the string to be search. returning false if the string is not found.
- Deletion is little bit complicated. The idea is to delete the key in bottom up manner using recursion. Special care has to be taken while deleting the key as it can be prefix of another key or its prefix can be another key in Trie.

Proposed Work :

- Our main idea is to create an efficient Library Management System that is able to get the details of the books currently present in the shelf (virtual) but is also able to add new books which are not currently present in the shelf.
- For this purpose we found the use of TRIE data structure to be the most efficient.
- We will be implementing three algorithms as of now the INSERTION. SEARCHING and DELETION.
- Further we will also be looking up ways to create a kind of Graphic User Interface for the same.
- We will also try to implement Word Auto Complete or Word Prediction.

References :

https://www.geeksforgeeks.org/
https://en.wikipedia.org/wiki/Trie
https://www.techiedelight.com/

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