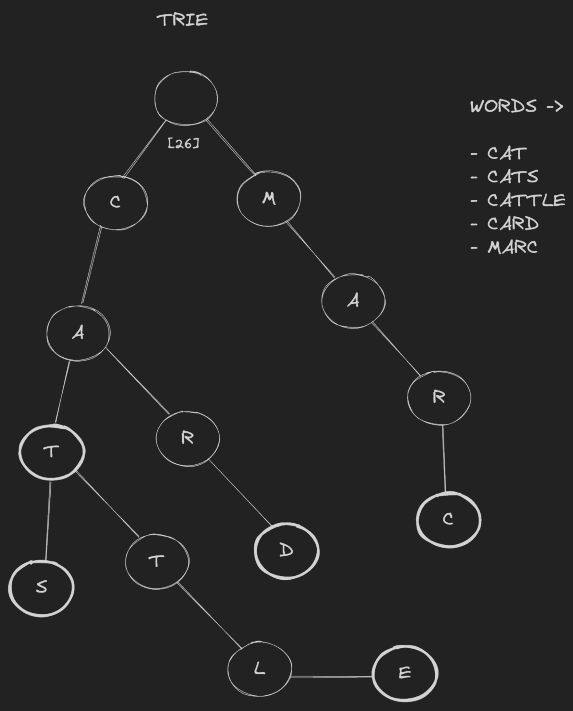
Operation	**Queue**
Insertion	O(m)
Search	O(m)

> m — the length of the word

Definition

A Trie, also known as a prefix tree, is a tree-like data structure that is used to efficiently store and retrieve strings. It is particularly useful for tasks that involve searching, matching, and autocomplete functionality.

- Each node in a trie represents a single character.
- The root node represents an empty string.
- Each node can have multiple children, which represent the possible characters that can follow the current character.
- Each node may also contain additional information, such as a boolean flag to indicate the end of a word.



Insertion

Adding a new word to the trie involves traversing the tree, starting from the root and following the appropriate paths based on the characters of the word. If a path for a character does not exist, a new node is created. The end of the word is marked by setting the end-of-word flag for the corresponding node.

Search

Searching for a word in the trie involves traversing the tree using DFS, following the paths based on the characters of the word. If the path for a character does not exist or the end-of-word flag is not set at any node, the word is not present in the trie.

Use Cases

- Autocomplete
- Spell Checking
- IP Routing