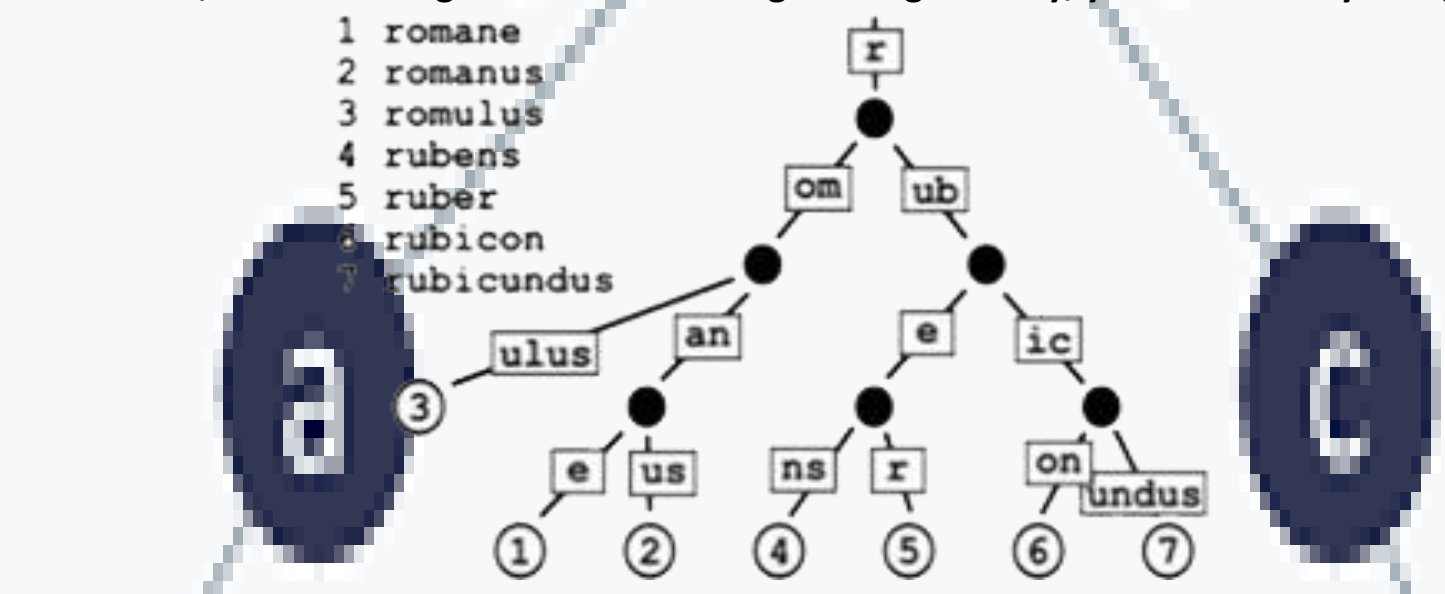
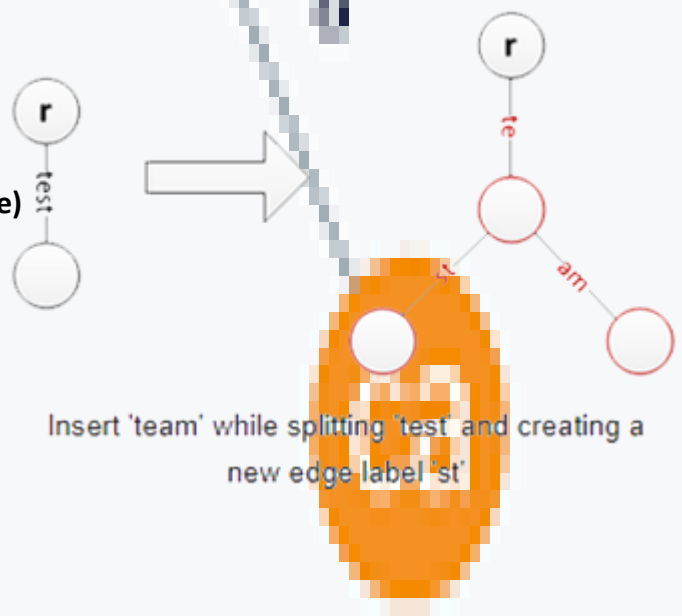
RADIX TREE

A radix tree is a data structure that represents a space-optimization Trie. By traversing from the root to any leaf, concatenating all the labels of edges along the way, you can find any string.



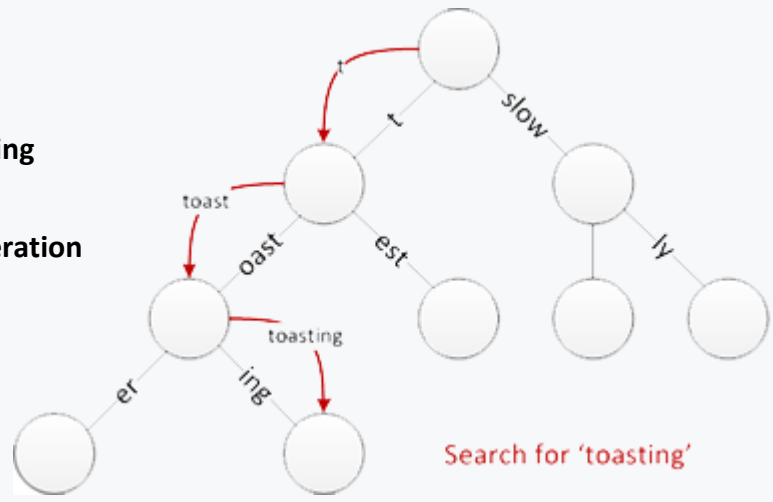
INSERTION

1. **Input the root node (the one without any character value assigned to it) and the whole word.**
2. **Then iterates through the word, one character at a time, starting with the first character.**
3. **Checks whether the current "node" (At the beginning of the process which points to root node) has a child node with that character.**
4. **If found, it just increments the counter of that node to indicate that it has got a repeated occurrence of that character.**
5. **If not found then it simply adds a new node as a child of the current node.**
6. **In both cases (4 & 5), it assigns the child node as the "current node" (which means in the next iteration it will start from here) before it starts with the next character of the word.**



SEARCHING

1. **Starts with the root node and the prefix to search for.**
2. **Takes one character at a time from the prefix and searches through the children of the "current node" (at the beginning which points to the root node) to find a node containing that character.**
3. **If found, it reassigns that child node as the "current node" (which means in the next iteration step it will start from here)**
4. **If not found then it returns False to indicate that the prefix does not exist.**



DELETION

First, we delete the corresponding leaf. Then, if its parent only has one child remaining, we delete the parent and merge the two incident edges.

APPLICATIONS

Trie are used in many string search applications such as auto-complete, text search, and prefix matching where else Radix Tree, a kind of trie that are often used in IP routing.