

IT251 Assignment-7

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TOPIC: TRIES

DESCRIPTION:

- The program can be executed by passing two extra arguments to ./a.out , first is problem number (either 1/2/3), second is input text file name, for eg. "input.txt"
- The program computes trie by taking vector of strings containing patterns wherein each node has 4 pointers, one node id, **isleaf** boolean(to state whether node is leaf node or not), and **endofword** boolean(to state node ends a word or not).
- Search operation is performed from each char and it is checked whether there is a pattern that matches the substring of the text. If yes, the start index is returned else the pointer moves one character ahead in the text.
- **Time complexity:**
 1. For forming the trie, time complexity is $O(n*p)$ where n is number of patterns and p is length of pattern.
 2. For problems 2 and 3, the time complexity is $O(t*p)$ where t is the length of text and p is length of pattern.

OUTPUT SCREENSHOTS:

Problem1:

Input:

3

ATAGA

ATC

GAT

Output:

```
suyash@suyash-VirtualBox:~$ cd Desktop/IT251/
suyash@suyash-VirtualBox:~/Desktop/IT251$ g++ 191IT109_Lab7.cpp
suyash@suyash-VirtualBox:~/Desktop/IT251$ ./a.out 1 input.txt
0->1:A
1->2:T
2->3:A
3->4:G
4->5:A
2->6:C
0->7:G
7->8:A
8->9:T
suyash@suyash-VirtualBox:~/Desktop/IT251$
```

Problem2:

Input:

AATCGGGTTCAATCGGGGT

2

ATCG

GGGT

Output:

```
suyash@suyash-VirtualBox:~/Desktop/IT251$ g++ 191IT109_Lab7.cpp
suyash@suyash-VirtualBox:~/Desktop/IT251$ ./a.out 2 input.txt
1 4 11 15
suyash@suyash-VirtualBox:~/Desktop/IT251$
```

Problem3:

Input:

ACATA

3

AT

A

AG

Output:

```
1 4 11 15
suyash@suyash-VirtualBox:~/Desktop/IT251$ g++ 191IT109_Lab7.cpp
suyash@suyash-VirtualBox:~/Desktop/IT251$ ./a.out 3 input.txt
0 2 4
suyash@suyash-VirtualBox:~/Desktop/IT251$
```

THANK YOU