

~~listen - silent~~
rat - art

grace - care

state - taste

state (æst^t)

$s_2 = \text{taste}$ (aefft)

$(N \log N)$

(N)

2-90

a - 97

b- 98

C - 99

४ - १२२

$$81 = abc$$

$$g^2 = cab$$

$$(97 + 98 + 99) = -$$

$$(99 + 97 + 98) = \underline{\quad}$$

$$g_1 = ac$$

$$\frac{196}{196}$$

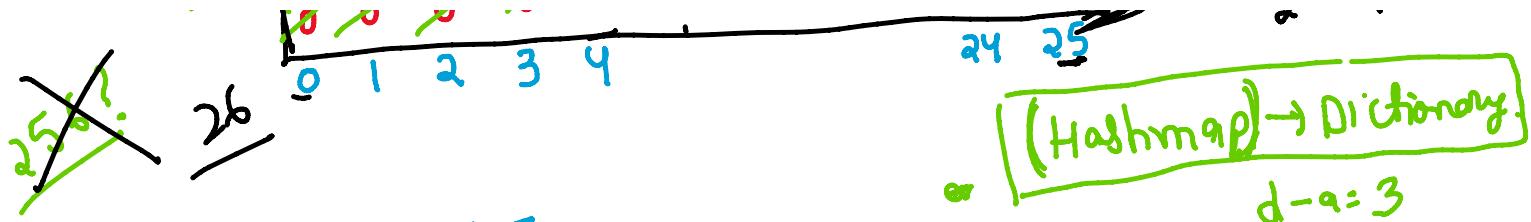
$$g_2 = bb$$

1

1. Sorting ($n \log n$)

d. _____

The diagram illustrates state transitions and memory storage. At the top left, a green box labeled "state" contains the sequence a b b d e. An arrow labeled δ_1 points from this state to another green box labeled "taste" containing the sequence c b a d b. From this taste state, an arrow labeled δ_2 points to a horizontal row of memory cells. The first four cells are labeled 0, 0, 0, 0. The fifth cell is labeled 1 (in blue) and has a red arrow pointing to it from the word "true". The next five cells are labeled 0, 0, 0, 0, 0. The final two cells are labeled 24 and 25, with a red arrow pointing to them from the word "true". A green box labeled "true" is positioned above the fifth cell.

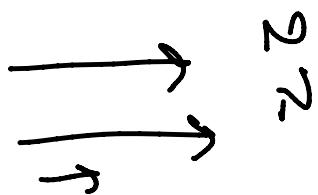


$$\begin{aligned} a - \underline{a} &= 0 \leftarrow \\ c - \underline{a} &= 2 \leftarrow \\ z - \underline{a} &= 25 \leftarrow \end{aligned}$$

false

$$\begin{aligned} a - q &= 0 \\ b - q &= 1 \end{aligned}$$

true



abczyzc
T

time - O(N)
space - O(26) $\rightarrow O(1)$

a z a b c y d
T check the length

non-zero \rightarrow false
 \rightarrow true



state table

s - Y0

t - XZ Y0

a - X0

e - γ^0

Valid palindrome

11 September 2022 13:45

madam
naman

madam
madam

anora

maam

→ check palindrome after deleting atmost 1 char. (true/false)

racecar → true

abcecar → false

~~grabcecar~~ → true
~~s\$~~ ~~e\$~~

not matching
S++
e--

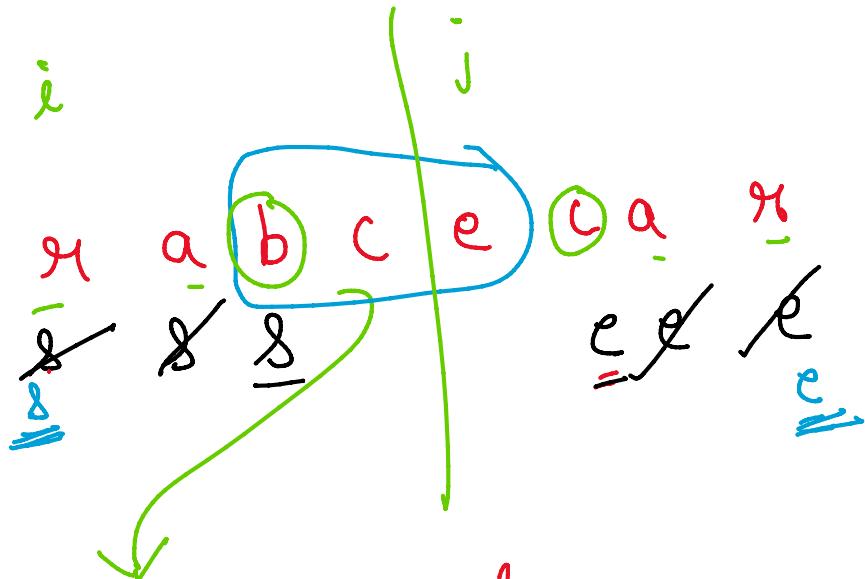
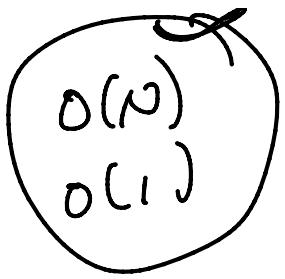
racecar X

~~s\$~~ ~~e\$~~

{ counter
boole.

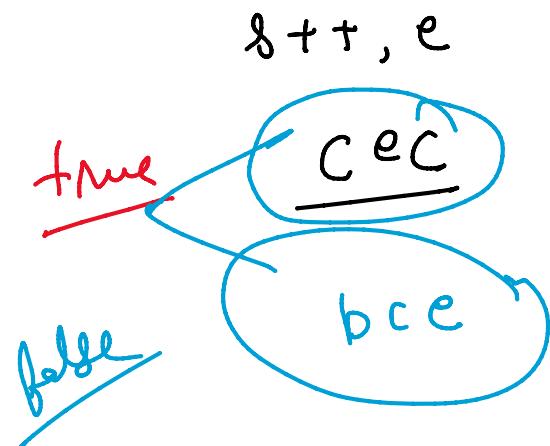
$O(N)$
 $O(1)$

1 1 -
~~s s s s~~ ~~e e e~~ 1 1



s++ [c e c] \rightarrow true
e-- [b c e]

s++ e-- DR

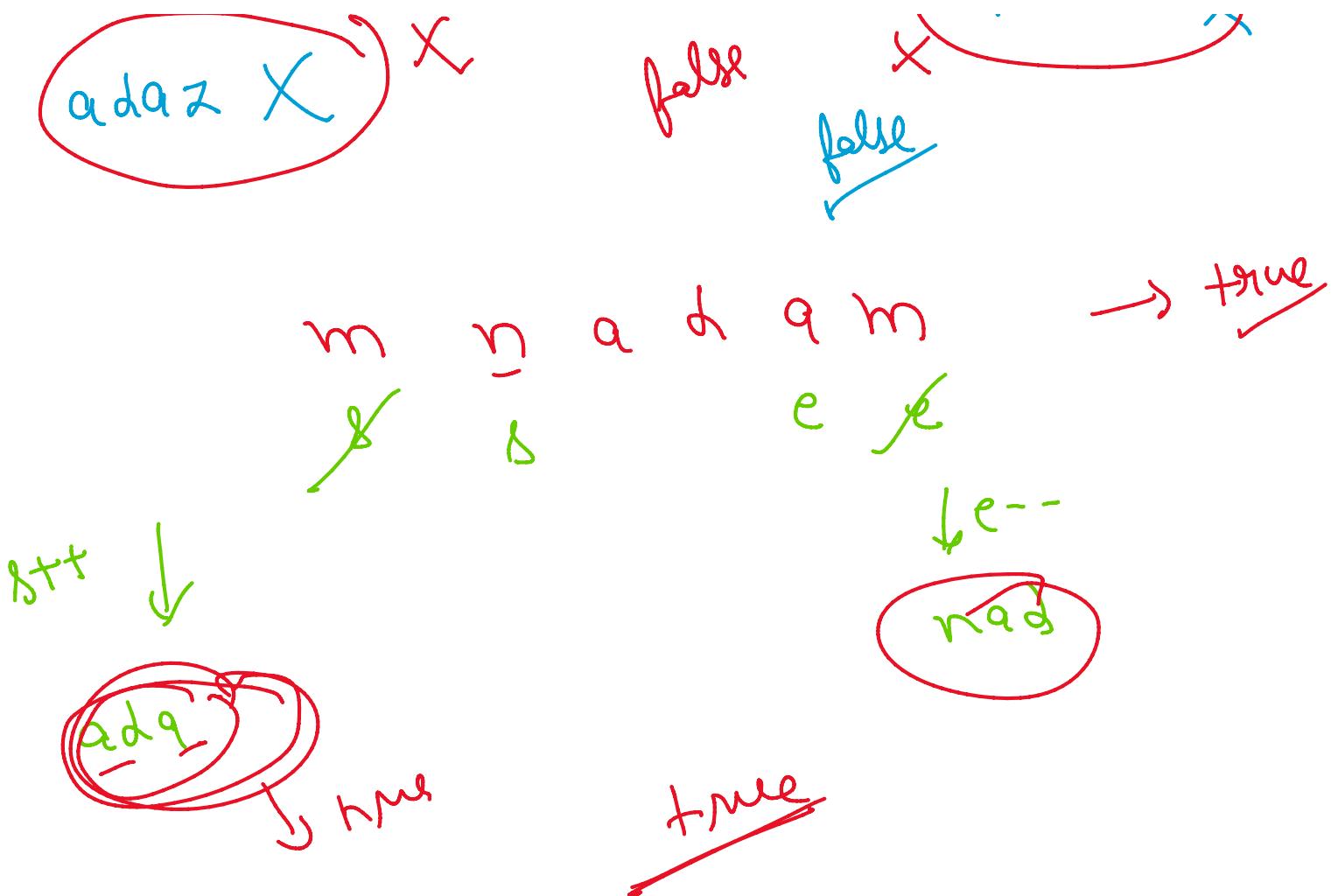


false

m n a d a z m
~~s s~~ e k

s++ \downarrow
~~~ l n ~ X X~~ X  
 false

A red oval containing the text hadg with a red X at the end. A red arrow points down to the oval.



## Compress string

11 September 2022 14:08

aaa mm C a bbb

a3 m2 C1 a1 b3

$\hat{a} \hat{x} \hat{y} \hat{z} \hat{d} \hat{i}$

$\rightarrow$  aa bbb c dd c bb

a2 b3 c1 d2 c1 b2

//  
for (i = 0; i < n)

while (i == j + 1)

X

a2 b3 c1

for ( )  
{ }  
j

O(N)

## Reverse words in a string

11 September 2022 14:24

$s = "take;leetcode"$

" ekat edocteet"

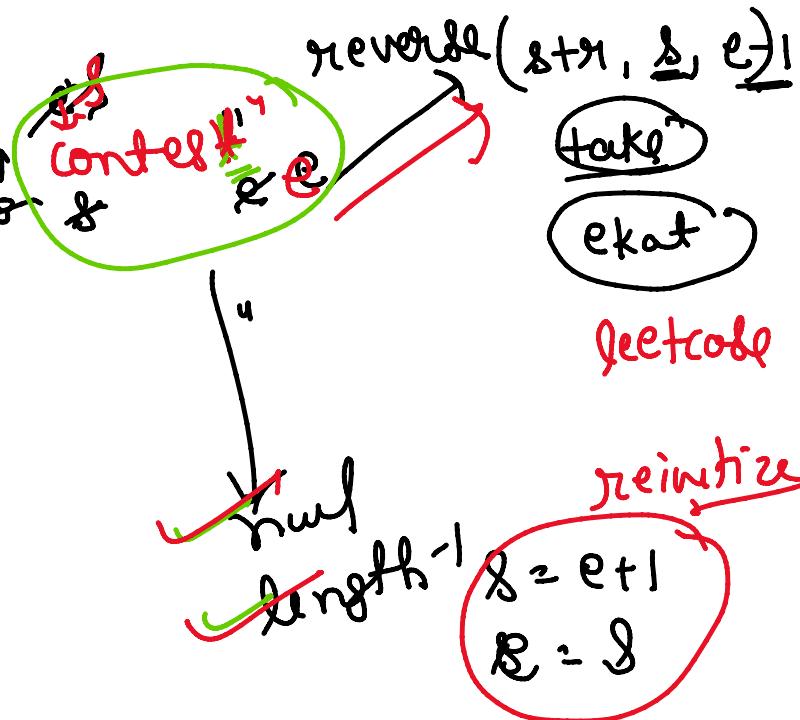
for (      )

reverse

reverse ( $str, s, e-1$ )

octeeleef  
leetode  
s    s    e

while ( $s < e$ )  
{      }



## Roman to Integer

11 September 2022 15:12

|      |      |
|------|------|
| 1 -  | I    |
| 2 -  | II   |
| 3 -  | III  |
| 4 -  | IV   |
| 5 -  | V    |
| 6 -  | VI   |
| -    |      |
| 8 -  | VIII |
| 9 -  | IX   |
| 10 - | X    |

output  
97 →

input  
XCVII  
~~XXIIII~~

$$90 + 5 + 1 + 1 = 97$$

in C → subtract  
else → add

(244)

CCXLIV

35

XXXV  
<sub>10 S</sub>

$10 + \underline{10} + 10 + 5$

... and / 100 base → add

X - 10  
C - 100  
L - 50  
V - 5  
I - 1  
VII  
(5) (1)  
S+1+1+1

|        |                  |
|--------|------------------|
| 20 -   | <del>XX</del>    |
| 24 -   | XXIV             |
| 27 -   | <del>XXVII</del> |
| 42 -   | XLII             |
| 50 -   | L                |
| 100 -  | C                |
| 500 -  | D                |
| 1000 - | M                |
| 57 -   | <del>LVII</del>  |
| 92 -   | XCII             |

40  
40 - XL  
90 - XC

25 - ~~XXV~~  
(10+10+5)  
decreasing

(50+5+1+1)

$$\text{STHTT}' \\ = 8$$

$$10 + 10 + 10 \rightarrow \\ = 30$$

equal / dec same → add  
increasing → subtract

$$90 \\ 10 \uparrow X \downarrow 50 \\ 10 \uparrow X \downarrow 100 \\ 90$$

$$(L-X) \\ (50-10) = 40 \\ (100-10) \\ 90$$

$$X \underline{C} i)$$

$$(C-X) \Rightarrow (100-10) \\ = 90 + 10$$

$$190$$

$$\underline{\underline{C X C}} \\ 100 + 90$$

$$(100 + (100-10)) \\ 100 + 90 = \underline{190}$$

$$100 \quad 10 \quad 100 \\ \underline{\underline{C X C}}$$

dec - add  
inc - sub

$$100 + (100-10)$$

$$721 \quad 500 \quad 100 \quad 10 \\ P \quad C \quad C \quad X \quad X \quad I \\ \cancel{X} \quad \cancel{X} \quad \cancel{X} \quad \cancel{Y} \quad \cancel{I}$$

$$500 \quad 100 \quad 10 \quad 5 \quad 190 \\ D \quad C \quad X \quad C \quad V \\ 695$$

$$500 + 100 + 100 + 10 \\ + 10 + 1 = 721$$

~~D C X C V X~~

$$500 + 100 + \cancel{(100 - 10)} + 5$$

dec - add  
inc - sub

695

1000 100 10 1 5

map (char int)  
if else

Integer to roman

leetcode

M G  
1000 100 10 1 5  
 $(1000 - 100) + (100 - 10) + (5 - 1)$   
 $= 1000 + 90 + 4$   
 $\sim 1994$

## Longest palindromic substring

11 September 2022 15:48

a b c level d c  
s s s

→ level

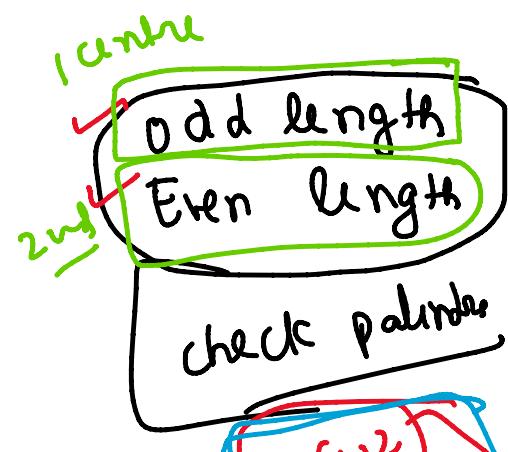
level

level

a b b a c a b b c  
bbacabb

0 1 2 3 4 5 6 7 8

a b a l e v e l d



$O(N^2)$

$O(1)$

✓  
ans = a  
length  
start point  
idx

level

abba

ss

tt

0 1 2 3 4 5 6 7 8 9

✓ X X X X X X X X

winner

maddam  
 a m i m a d d a m d e  
 ↗ 9

arr = maddam  
 length = 6  
 startIndex = 0 / 2

l - l - l - l - l - l  
 ↗ 6

madam  
 maddam

madam

- ① code for LPS
- ② Integer to Roman
- ③ Reverse words in string

③

Reverse wave-