

Strings Introduction

↳ combination of characters
series
collection
array

→ immutable array of characters

ASCII
↳ standard
Mapping
from
character to an
integer

building
block of
storage

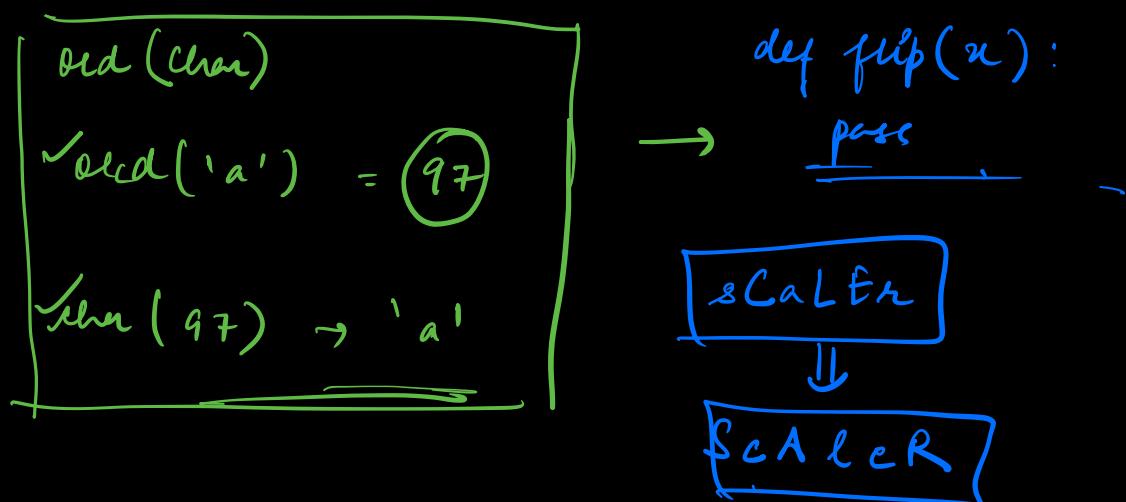
eg
99

'A' → <u>65</u>	'a' → 97	'0' → 48
'B' → 66	'b' → 98	'1' → 49
'C' → 67	'c' → 99	'2' → 50
'D' → 68	'd' → 100	'3' → 51
'E' → 69	'e' → 101	'4' → 52
'F' → 70	'f' → 102	'5' → 53
'G' → 71		'6' → 54
'H' → 72		'7' → 55
'I' → 73		'8' → 56
'J' → 74		'9' → 57

unique no. is associated with
every character

$$\begin{aligned}
 'A' &\rightarrow 65 \rightarrow (01000001)_2 \quad \text{8 bits} \\
 'a' &\rightarrow 97 \rightarrow (01100001)_2
 \end{aligned}$$

Q Given a string. You have to flip the case of all the characters of a string.



Q Given a string. → containing * lowercase * alphabets. sort the string

Example: $["dabc acdb"] \Rightarrow ["aa bbcc dd"]$

Approach 1

① $\text{str} \rightarrow \text{List}$
 ② $\text{sort. } l \cdot \text{sort}()$
 ③ ${}^n \cdot \text{join}(l)$

$\Rightarrow \underline{\mathcal{O}(n \log n)}$

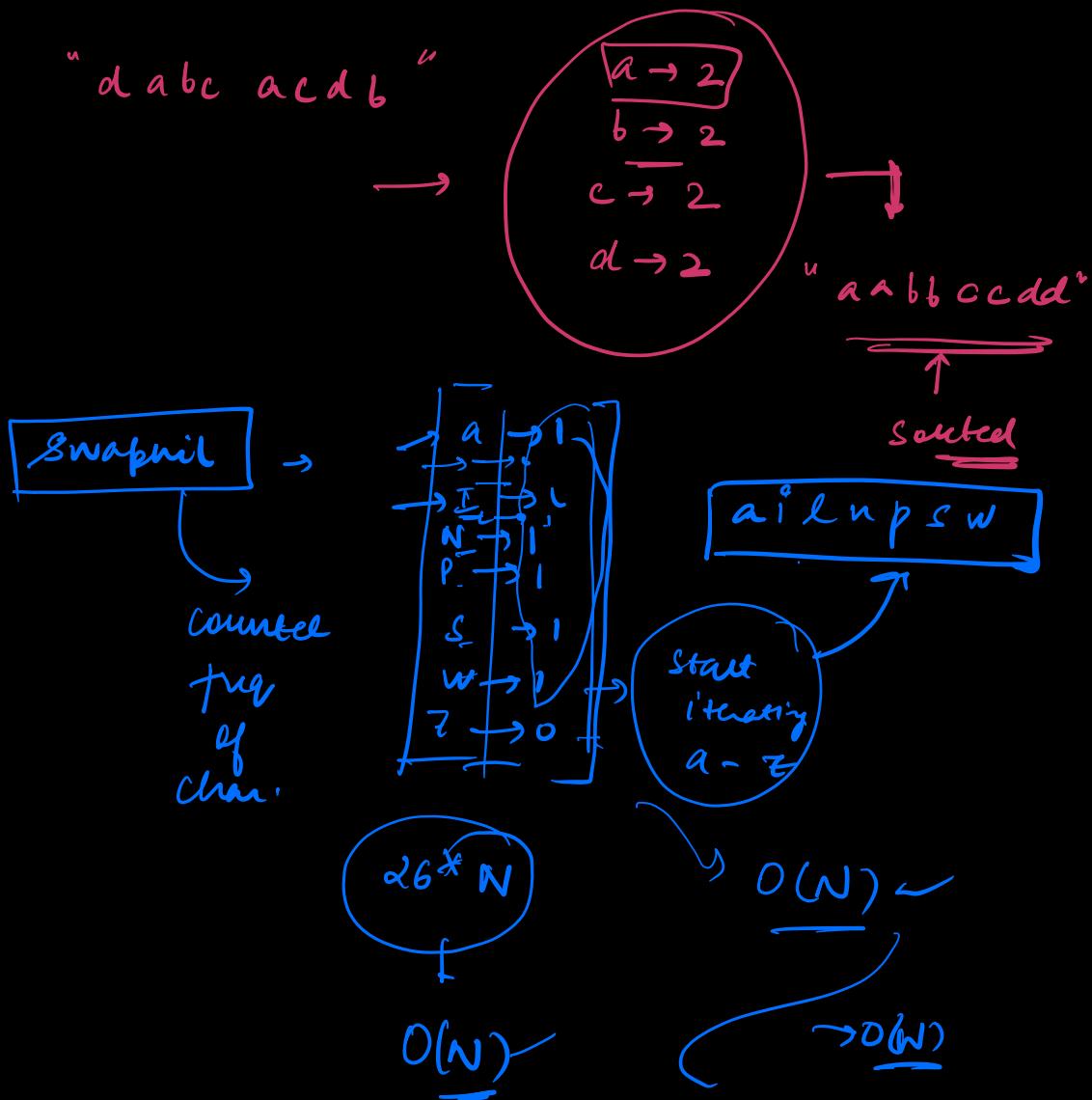
'a' > 'b'

False

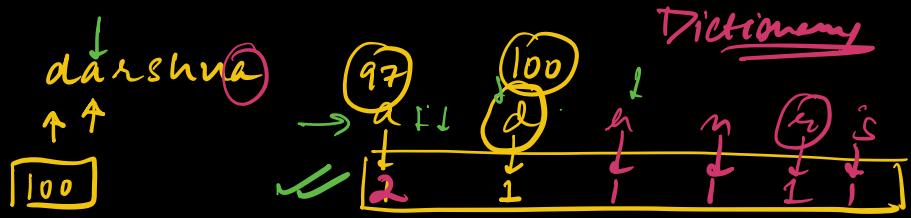
1 2 1 1 2 - - - 10⁵

Distinct $\rightarrow 26$

26 characters



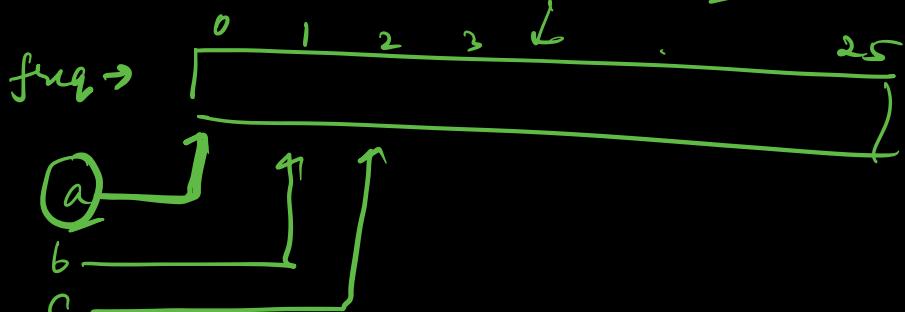
ans
ans b
ans 1
1
1
int a



aad han rs

SC = $O(N)$

initialise a list (26)



freq = [0] * 26
for x in string:
 freq[ord(x) - ord('a')] += 1

for i in range(26)
 for j in range(freq[i]):
 ans += ans(97 + i)

return ans

Count sort

Q Reverse a subarray

- ① convert to list $i \rightarrow j$ 2 pointers
- ② while $i < j$ machine
 $l[i], r[i]$
 $= l[j], r[i]$ minimize
while $i < j$

return join of list

Q Reverse words in a sentence

"g am Ramu ?"
"Ramu am g ?"

Ans: ① s.split() \rightarrow l ["s", "an", "Ramu"]

② Reverse a list

③ Join it back

def reverse_sentence(u)

$l = u.split()$

$O(N)$

while $i < j$:

$l[i], l[j] = l[j], l[i]$

extra
space

11. $\text{join}(l)$ -

Prefix string :-

"Prasad"
Any substring starting from $i=0$

"p" "pr" "pra" "pras" ... "prasad"

Q Given 2 strings. Find the length of
longest common prefix string.

\rightarrow abac \rightarrow abac
 \rightarrow abac \downarrow 4
a
b
a
c
a
b
a
c
a
r
s

ans = 0
for i in range (min (len(a), len(b))):
 if a[i] == b[i]:
 ans += 1
 else
 break

Follow up

n strings

[~~abacus~~, ~~abracadabra~~, ~~abracadabra~~]

ab

ans = ab len = 2

i = 0

~~acc~~ $x = a$ ✓
 $x = b$ a

~~ans~~ \neq ab

~~acc~~

$\ell[i][j]$

$N^* \text{ len (str)}$
min

Palindromes

↳ what is a palindrome?

NAMAN

NITIN

MALAYALAM

↳ Reverse of the string
is same as the
normal string
original

Check if a string is palindrome?

→ $a = = a [:: -1]$
reverse (str) = = str $\quad O(N)$



2 pointers

$i=0 \quad j=n-1$
while $i < j$:

if $arr[i] = arr[j]$

, break return True

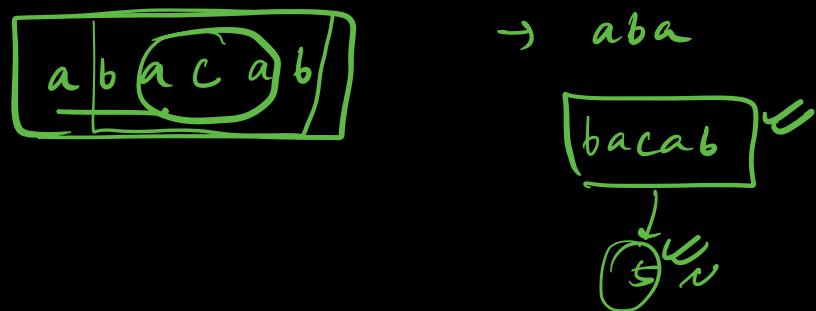
$i+=1$

$j-=1$

N A M A N
^ ^

return False

Q Find the length of longest palindromic substring



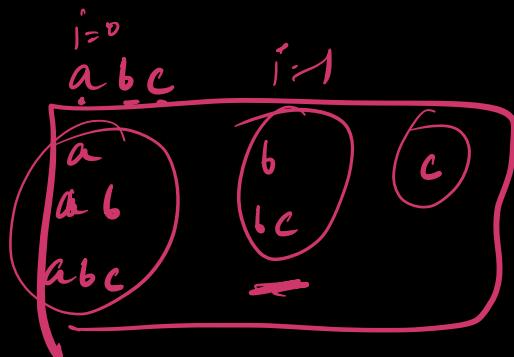
BF: $\frac{n^*(n+1)}{2}$ substrings

↳ Extra loop for reverse

↳ $O(n^3)$ $\frac{N^2 * N}{2}$ generation for checking $O(n^3)$
substrings a palindrom

→ for i in range ($\text{len}(a)$)

→ for j in range (i , $\text{len}(a)$).



$O(n^2)$

θ n^2

$n^2 \times n$







NITIN



$N \rightarrow N$

~~AA \rightarrow N~~

~~NAM \rightarrow A~~

~~NAMA \rightarrow~~

~~N \rightarrow M~~

ans = 0

ODD length Palindromic substrings

for i in range (len(a))

$len = 1$ $n = \text{len}(a)$

$x = i - 1$ $y = i + 1$ (1)

while $x > 0$ and $y < n$:

\rightarrow if $A[x] = A[y]$ \leftarrow

N
N
A
NAM
M,
AMA
NAMAN

$$\frac{len + 1}{2} = 1$$

$$y + 1 = 1$$

else :

break

$$ans = \max(ans, len)$$

$$\Theta \underline{\underline{O(n^3)}}$$

abba

$$\begin{matrix} & & & & 3 \\ & & & & + 2 \\ \boxed{1} & 1 & 1 & 1 & = 5 \\ & & & & \text{inarray} \end{matrix}$$

✓ cd dc ab ba c d c ✓
~~TTTT~~ ✓ ✓ ✓ ✓ ✓ ✓ ✓
 $\frac{len + 1}{2} = 2$ ans = 6 & $D = 12$

for i linear D

by i i+1 i+2

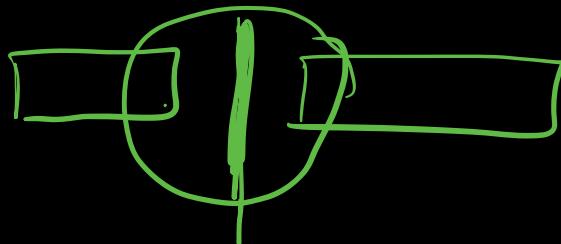
Diagram illustrating a string matching or parsing process. The string **abaa&a** is shown in a box above the string **a\$ b \$ a \$ a q b q a**. The character **\$** is circled in the bottom string, and a circled **q** is also present. An arrow points from the circled **\$** to the circled **q**.

✓ a \$ b \$ a \$ a \$ b \$ a
✓ r ↑ | ↑ i ↑ | ↑ ,

$$\underline{\underline{5}} - \underline{\underline{5/12}}$$

~~data~~ ~~ba~~ ~~ba~~ ~~ba~~ f c d e f

abbacc ddeeef



$n = \text{len}(a)$

for i in range($n-1$):

$x = 0$

$y = i$

$\underline{y = i+1}$

while $x \geq 0$ and $y < n$

if $A[x] = A[y]$

$\underline{\text{len} += 2}$

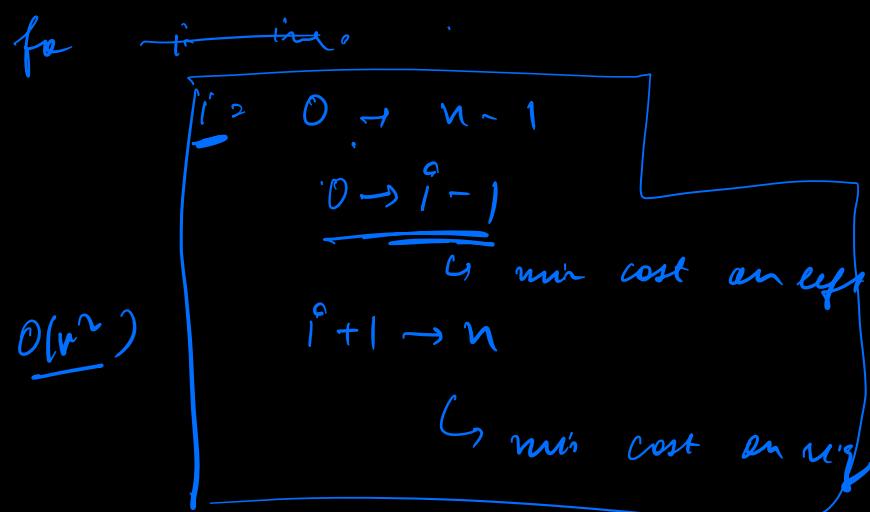
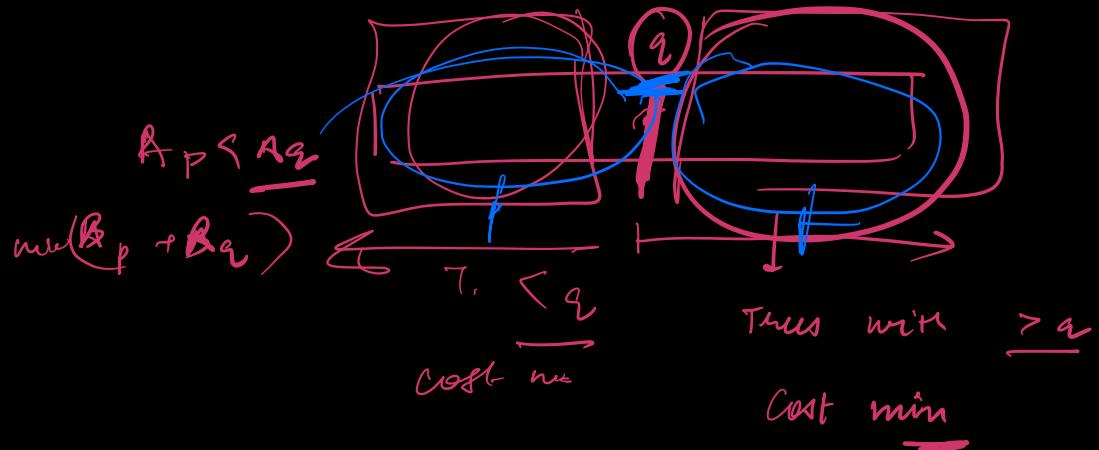
$x -= 1$

$\underline{y += 1}$

$\underline{, \text{len}}$

$\underline{\text{break}}$

$\underline{\text{ans} = \max(\text{ans}, \text{len})}$



$\boxed{90 \quad 9}$

~~$990 < 9$~~

~~$\boxed{990 \quad 9}$~~

~~$\boxed{89 \quad 8}$~~

~~$\boxed{12 \quad 21}$~~

~~$89 \rightarrow 92$~~

