= Character Arrays

int 12 ← 4B → == char 'AB' X ← 1B →

↳ Seq. of char. is o.k.a String

String → internally character array

How to declare char array ?

char str[↑] = { } ;

size is optional

int a[] = {1, 2, 3} ✓
int a[6] = {1, 2, 3} ✓
int a[5]; ✓

char str[] = {'A',..} ✓
char str[5] = {'A'..} ✓
char str[5];

Size should specified implicitly or explicitly. implicitly

Why we're getting garbage?

char str1[] = {'A', 'B', 'C', 'D'}

cout << str1; // ABCD ?...

A | B | C | D | 10 | ? | ... | \0

(char *) `str1`

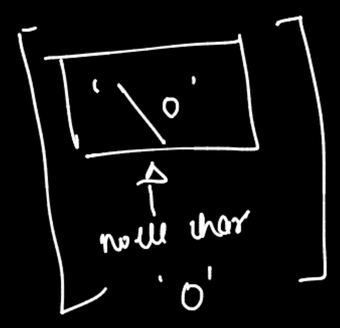
char str2[] = {'w', 'x', 'y', 'z'}

w | x | y | z | A | B | C | D | \0

str2

cout << str2 // wxyz ABCD
garbage

↳ Always terminate your char. array by '\0'.



↳ char. array are used to store strings

** a seq of char. terminated by '\0'

char str[] = "abcdef"

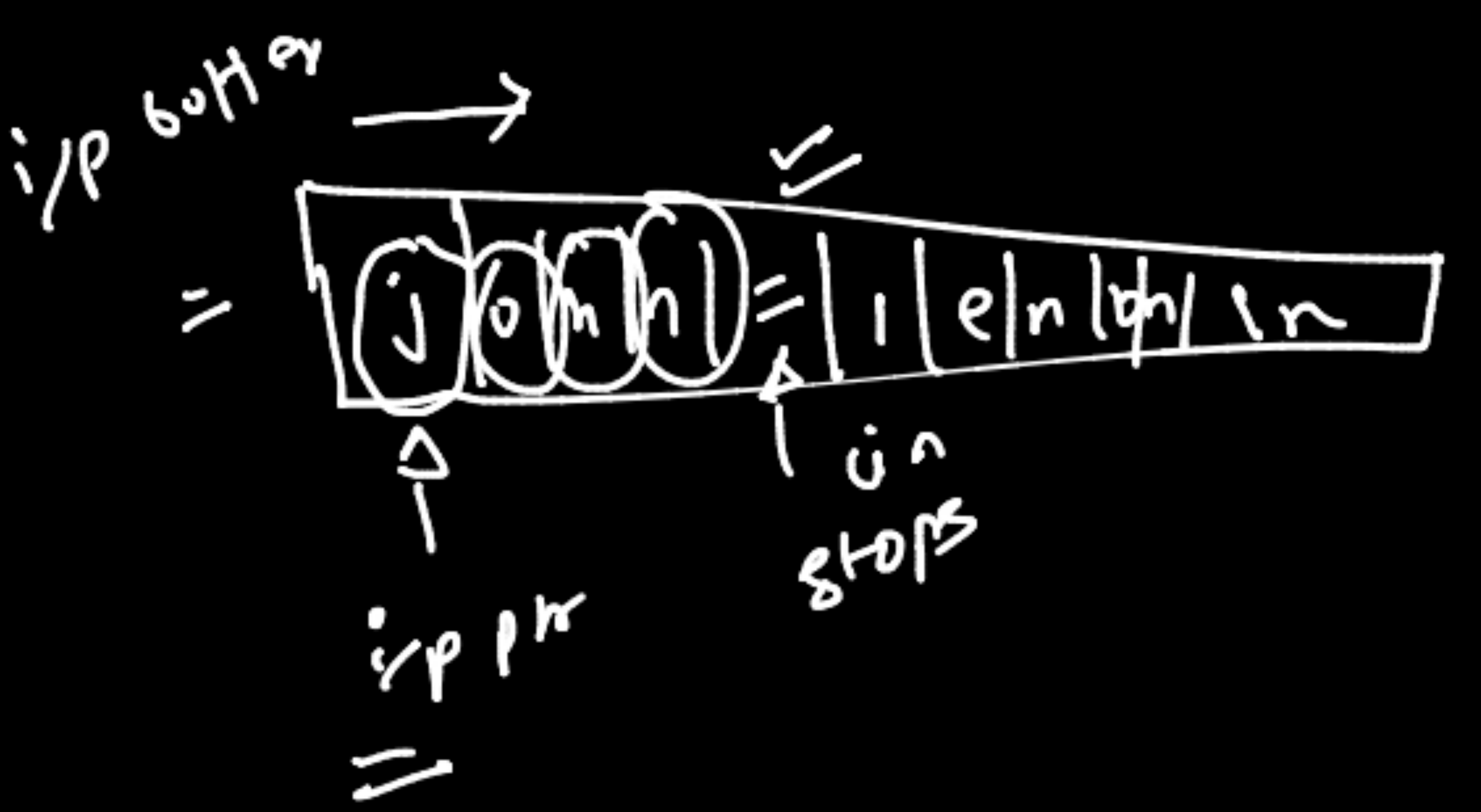
\0 is added automatically

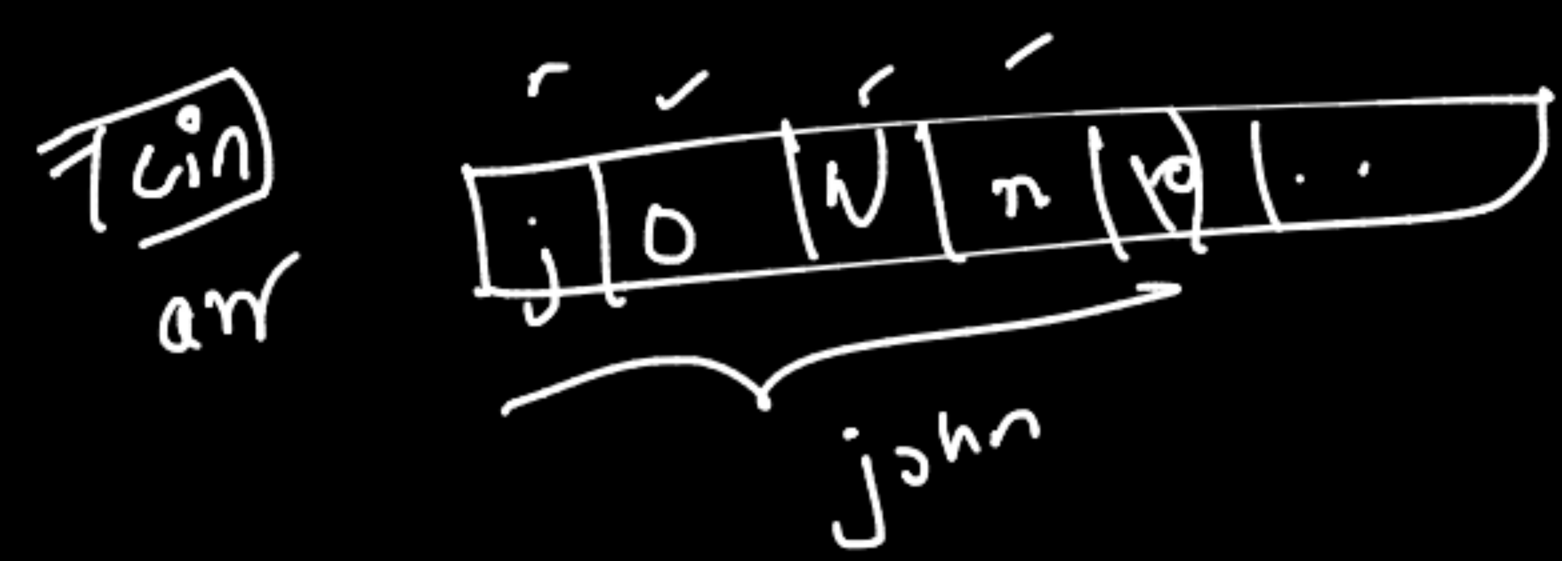
⇒ char str[6] = "abcdef";

≥6

7

error



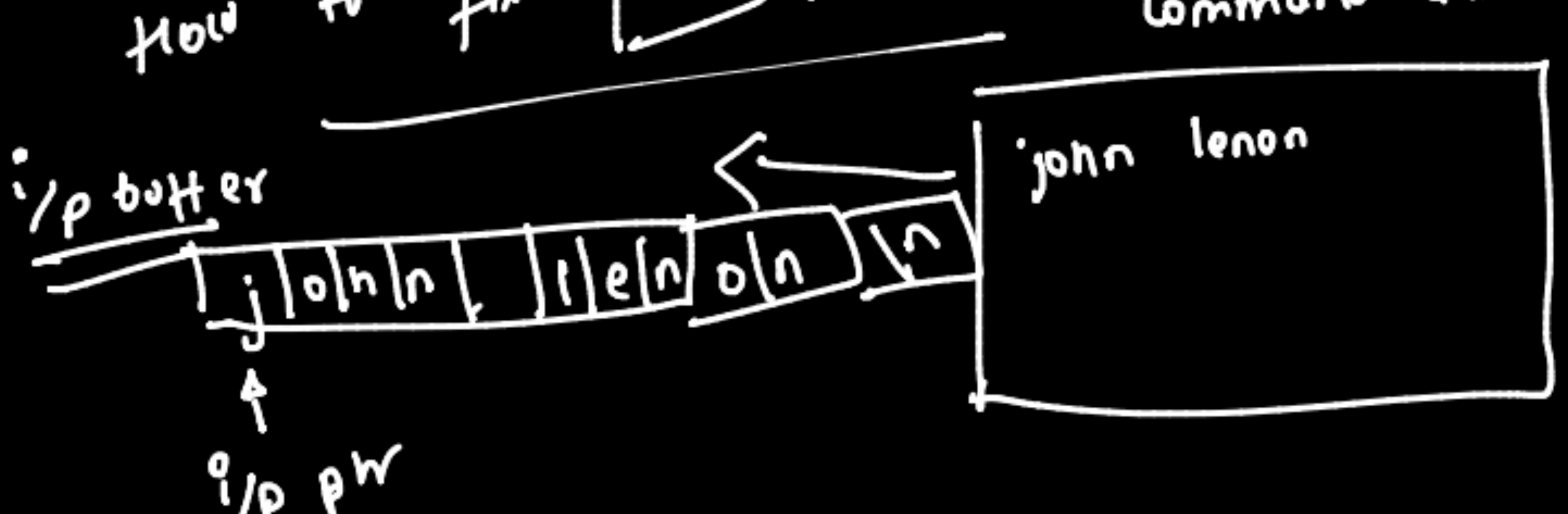


How to read into char arrays from user i/p?

- char str[5]; → size imp.
- cin >> str; // directly // abcd
- added automatically

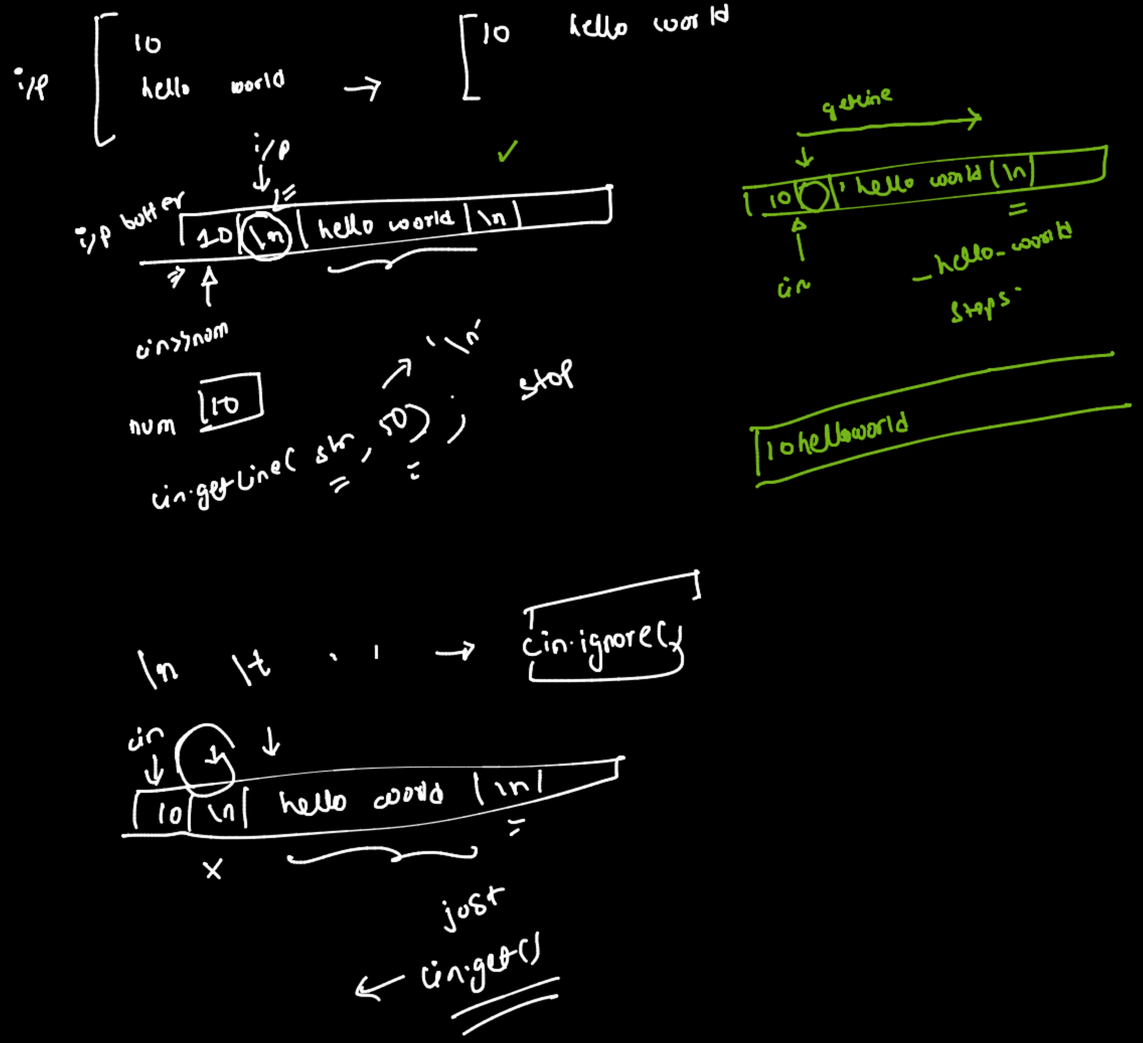
str | a | b | c | d | \0 |

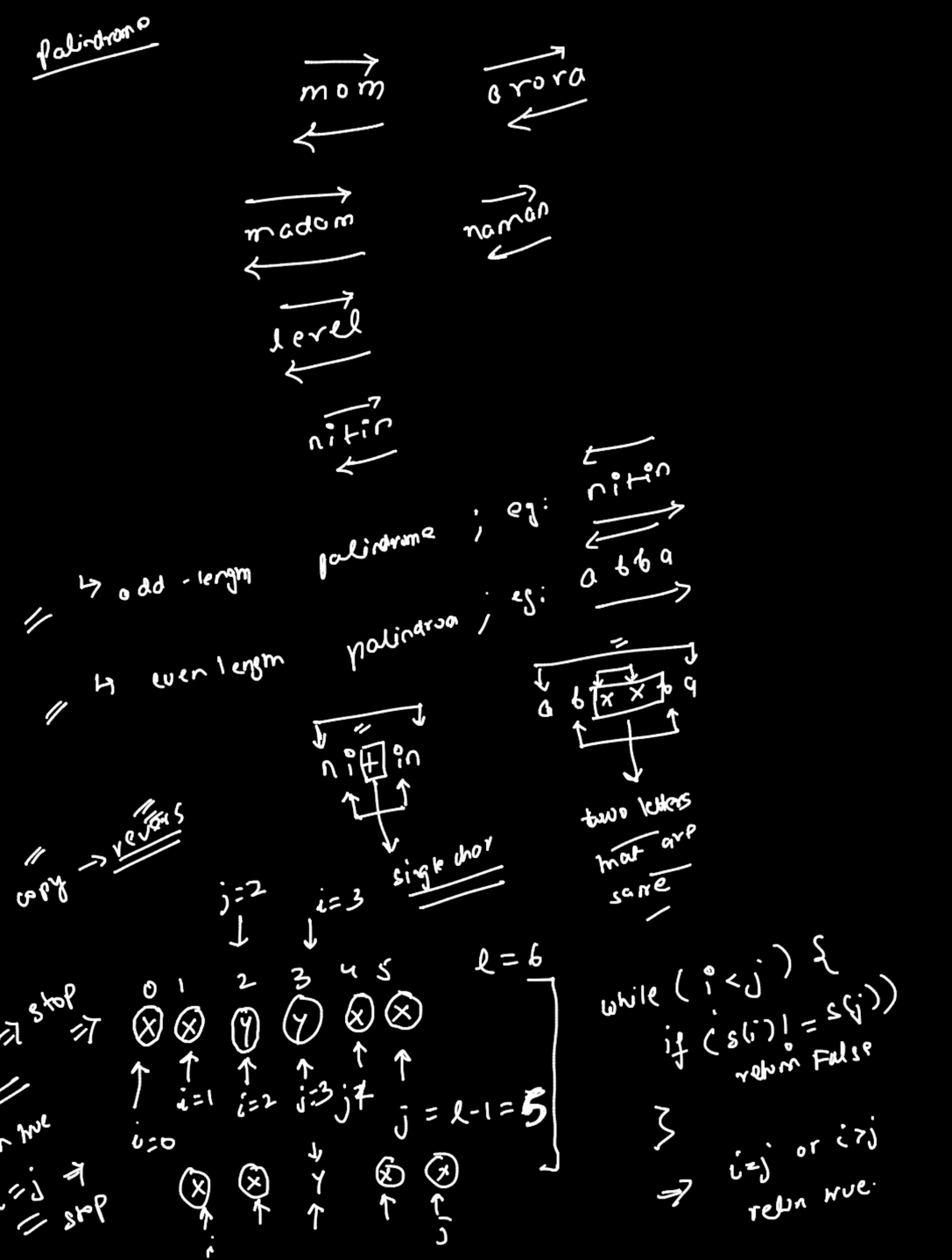
How to fix cin problem?

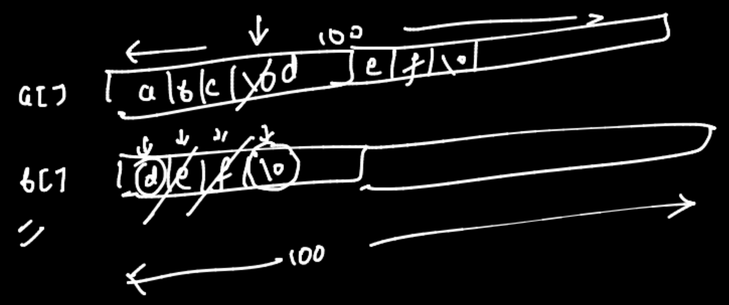


to fix problem, use some other fn that doesn't stop at space.

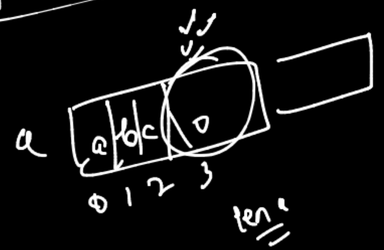
⇒ cin.get(); // fn to read a single char from i/p buffer

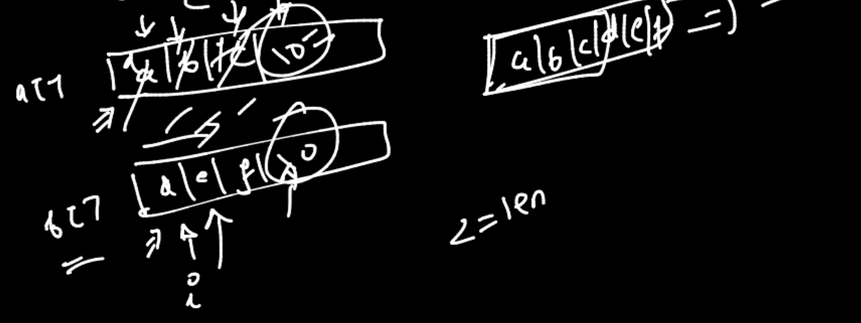

i/p
10
hello world
i/p buffer
10 \n hello world \n
cin>>num
num 10
cin.getline(str, 50);
stop
getline
10 hello world \n
cin
_hello_world
steps.
10helloworld
\n \t , ! → cin.ignore()
cin
10 \n hello world \n
x
just
← cin.get()


palindrome
mom
arora
madam
naman
level
nitin
→ odd - length palindrome ; eg: nitin
→ even length palindrome ; eg: abba
n i t i n
single char
a b b a
two letters that are same
str, copy → reverse
i ≥ j ⇒ stop
return true
i = j ⇒ stop
i=0
i=1
i=2
j=3
i=3
j=2
j
i
0 1 2 3 4 5
l = 6
j = l-1 = 5
while (i < j) {
if (s[i] != s[j])
return False
}
⇒ i=j or i>j
return true.



a[] = abc def \0





maxlen = INT_MIN
char arr[100];

↳ read a string = temp[100]

↳ cal its length using strlen ()

↳ l > maxlen {

maxlen = l

Strcpy(arr, temp)

}

↳ cout << maxlen << endl;

int (strlen(char array))

4 → # bytes

↳ size_t

return ⇒ unsigned int

float a = 5.79

int (a) ⇒ 5

(lower-case) ⇒ 26 'a' to 'z'

a[] = "aabbcccd"

2 2 3 1

0	1	2	3	4	5	…	25
2	2	3	1	0	0	0 … 0	0

"a b a b d c c c"

⇒ | 2 | 2 | 3 | 1 | 0 | 0 | 0 … |

[Space & time is always wrt to input size]

extra space

freq array ⇐ O(1)

extra space ✓

a → 0

b → 1

c → 2

⋮

z → 25

ch = 'a' ⇒ 0

⇓

97

'a' − 'a' = 97 − 97

= 0

⇒ 'b' − 'a' = 98 − 97

⇒ = 1

⇒ 'c' − 'a' = 99 − 97

= 2