

## → How to Approach?

For any given string, In order to make it palindrome  
Attach the reverse of the string.

Eq: String = "abcd"

To make it palindrome, attach the reverse string "dcba".

$$\text{i.e. } \text{abcd} | \text{dcba} = \text{abccccba}$$

Now, this gives us a clue that, if we add a reverse string  
We get palindrome, no matter what the string is.

→ So for abcd, the no of operations to make is palindrome

is 4 ie dcba

⇒ Now to get the Minimum No of operations, what we can do is, We can see if Palindrome btwn the pairs exists.  
If they do, we dont need to reverse them.

If they do, we dont need to reverse them.  
If they do, we can add cbba

Eq. abbc to make it palindrome we can add cbba

= abcccbba = 4 operations

but bb already is a pair, so if we remove bb,

In just 2 operations we can make a string palindrome

by adding 'ac'

add here = 2 operations

One way

$$= \text{abbc} \rightarrow \overset{\downarrow}{\text{a}} \overset{\downarrow}{\text{a}} \overset{\downarrow}{\text{b}} \overset{\downarrow}{\text{b}} \overset{\downarrow}{\text{c}} \overset{\downarrow}{\text{c}}$$

or

$$= \text{abbc} \rightarrow \overset{\downarrow}{\text{a}} \overset{\downarrow}{\text{c}} \overset{\downarrow}{\text{b}} \overset{\downarrow}{\text{b}} \overset{\downarrow}{\text{c}} \overset{\downarrow}{\text{d}} = 2 \text{ operations}$$

or

$$= \text{abbc} \rightarrow \overset{\downarrow}{\text{c}} \overset{\downarrow}{\text{a}} \overset{\downarrow}{\text{b}} \overset{\downarrow}{\text{b}} \overset{\downarrow}{\text{a}} \overset{\downarrow}{\text{c}} = 2 \text{ operations}$$

& so on, but with 2 operations, we can make a string palindrome