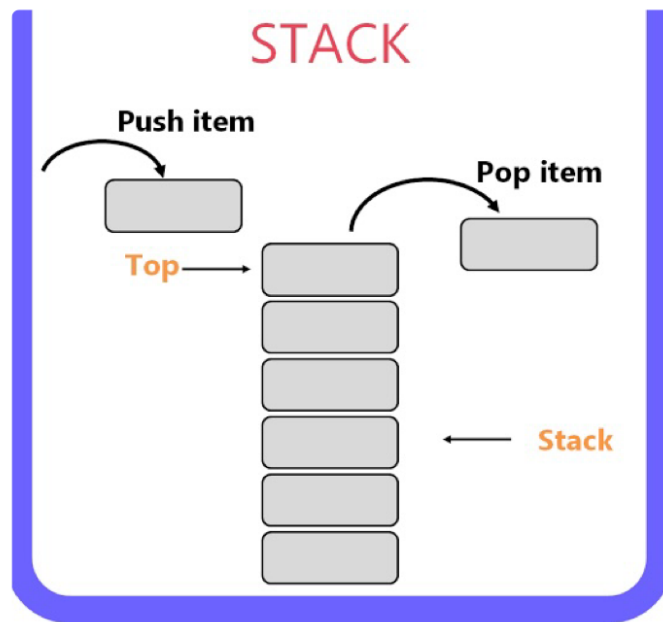


STACK...
Video → 19 ✓



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1717. Maximum Score From Removing Substrings

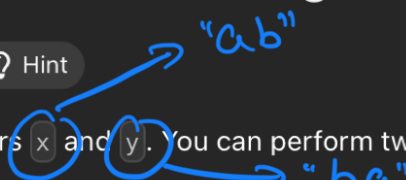
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Hint

You are given a string `s` and two integers `x` and `y`. You can perform two types of operations any number of times.



- Remove substring "ab" and gain x points.

- For example, when removing "ab" from "cabxbae" it becomes "cxbae".

- Remove substring "ba" and gain y points.

- For example, when removing "ba" from "cabxbae" it becomes "cabxe".

Return the maximum points you can gain after applying the above operations on s .

Example:- $s = "cd b c b b a a a b a b"$

$$x = 4 \rightarrow "ab"$$

$$y = 5 \rightarrow "ba"$$

$$5 + 5 + 5 + 4 = 19$$

Output :- 19

Thought Process

$S = "a a b b a a x y b b a a b b"$, $x=5$, $y=4$

$$\Rightarrow 5 + 5 + 4 + 5 = 19 \quad \times$$

$$(5 + 5 + 5 + 5) = \underline{\underline{20}}$$

1 Pass \rightarrow max value string.

2 Pass \rightarrow min value string.

Proof :-

why deleting max-value string
first and then deleting min-value
string always works ???

"ab" \rightarrow x

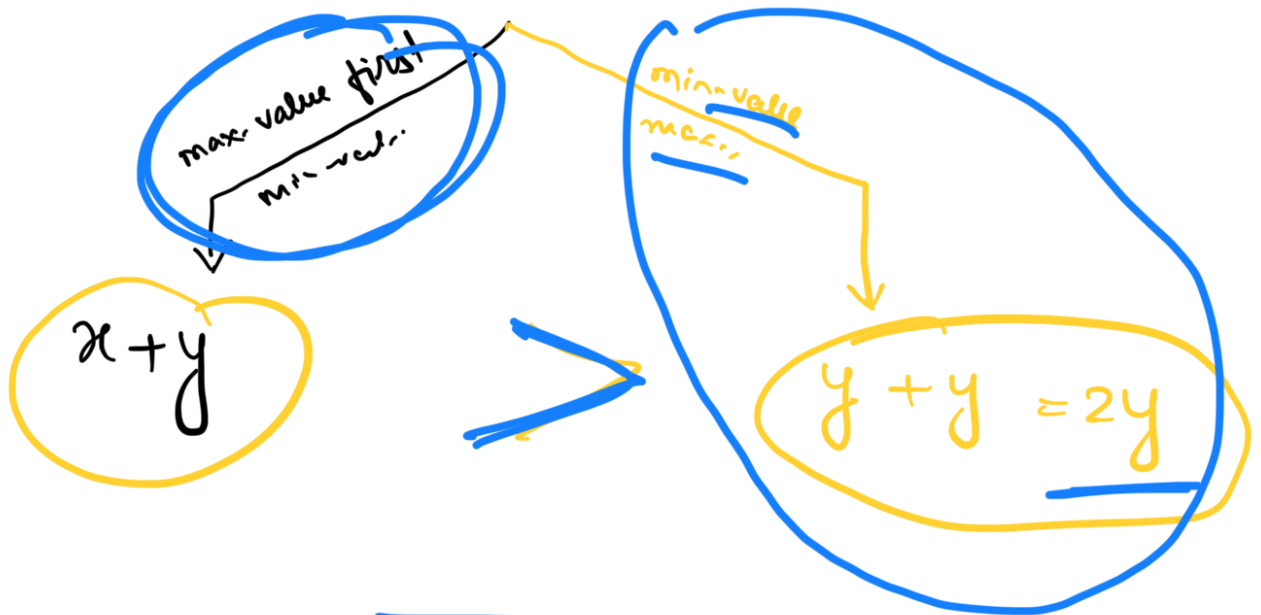
"ba" \rightarrow y

$$x > y$$

"Proof" by

b a b a

Contradict)



$$x > y$$

$$x+y > y+y$$

$$(x+y) > 2y$$

Why Stack???

$S = \text{"aabbbaaxybbbaabb"}$, $x=5$, $y=4$
 $\rightarrow n=14$

"ab" \rightarrow ~~ab~~

b
b
y
x
a
a

"aaxybb"
 $\rightarrow 6$

$$14 - 6 = 8 / 2 = 4$$

(ab) (ab) (ab) (ab)

$$\text{Points} = 4 * 5 = 20$$

"ba"

aaxybb
 $\rightarrow 6$

b
b
y
x
a
a

6

$$6 - 6 = 0 / 2 = 0$$

$$0 * y = 0 * 4 = 0$$

1st Pass "ab" = 20 7 2

$$n-1 \quad "ba" = 0 \quad \underline{\underline{9^{20}}}$$

Proof: +

$$\begin{aligned} T.C &= O(n) \\ S.C &= \underline{\underline{O(n)}} \end{aligned}$$

Approach-2 (Hidden Problem) Without Stack

$S = "aabbbaaxybbbaabb"$, $x=5$, $y=4$

$\begin{matrix} \text{"ab"} & \text{"ba"} \\ \uparrow & \uparrow \end{matrix}$

$c \quad d \quad \overset{i}{a} \quad b \quad b \quad a \quad b \quad b \quad "$ \Rightarrow "cd"

$"c \quad \underline{ab} \quad d \quad \underline{aabb}"$

"ab"

ab

↓ 'cd'

i → writing
j → reading

whatever j reads
, it will write it
on ith pointer.

c d b c ~~b~~ ~~b~~ ~~a~~ ~~a~~ ~~b~~ ~~a~~ ~~b~~