

ARRAY : Video - 54

Medium

Leetcode  
-2483

...E.A.S.Y...



codestorywithMIK

# Minimum Penalty for a shop

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## 2483. Minimum Penalty for a Shop

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You are given the customer visit log of a shop represented by a 0-indexed string `customers` consisting only of characters 'N' and 'Y' :

- if the  $i^{\text{th}}$  character is 'Y', it means that customers come at the  $i^{\text{th}}$  hour
- whereas 'N' indicates that no customers come at the  $i^{\text{th}}$  hour.

If the shop closes at the  $j^{\text{th}}$  hour ( $0 \leq j < n$ ), the **penalty** is calculated as follows:

- For every hour when the shop is open and no customers come, the penalty increases by 1.
- For every hour when the shop is closed and customers come, the penalty increases by 1.

Return the **earliest** hour at which the shop must be closed to incur a **minimum** penalty.

**Note** that if a shop closes at the  $j^{\text{th}}$  hour, it means the shop is closed at the hour  $j$ .

open  $\rightarrow$  N  $\rightarrow$  1  
closed  $\rightarrow$  Y  $\rightarrow$  1

Example :-

Customers =

0	1	2	3
Y	Y	N	Y

Output = 2

# Brute Force...

Cust

0	1	2	3	4	5	6
Y	Y	Y	N	Y	N	Y

7



Ad

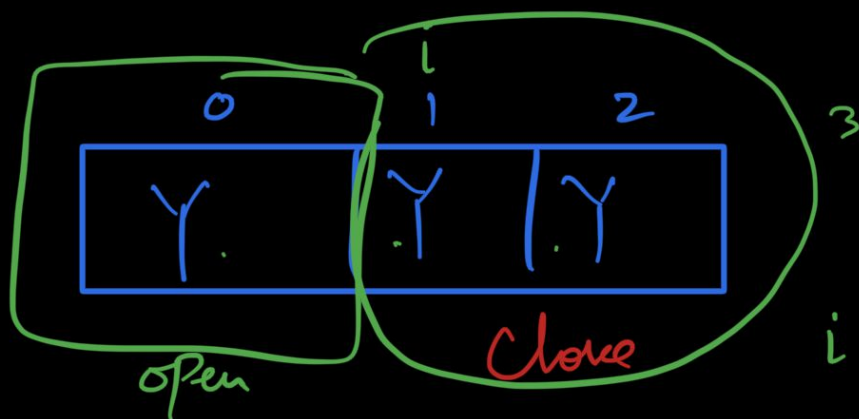


	0	1	2	3	4	5	6	7
Cust	Y	Y	Y	N	Y	N	Y	

open

$$\begin{aligned} \text{minPen} &= 2 \\ \text{minH} &= 3 \end{aligned}$$

$$\text{Penalty} = 2 + 0 = 2$$



$$\begin{aligned} \text{minP} &= \cancel{2} \cancel{2} \cancel{0} \\ \text{minH} &= \cancel{0} \cancel{1} \cancel{2} \end{aligned}$$

$$\text{Penalty} = 0$$

3

TLE

```
for(int i=0; i<n; i++)  
{  
    ① j=i-1 to 0  
    open(N)
```

```
    ② j=i to n-1  
    close(Y)
```

$$\text{Pen} = ① + ②$$

TLE ;)

I hate you

$O(n^2)$

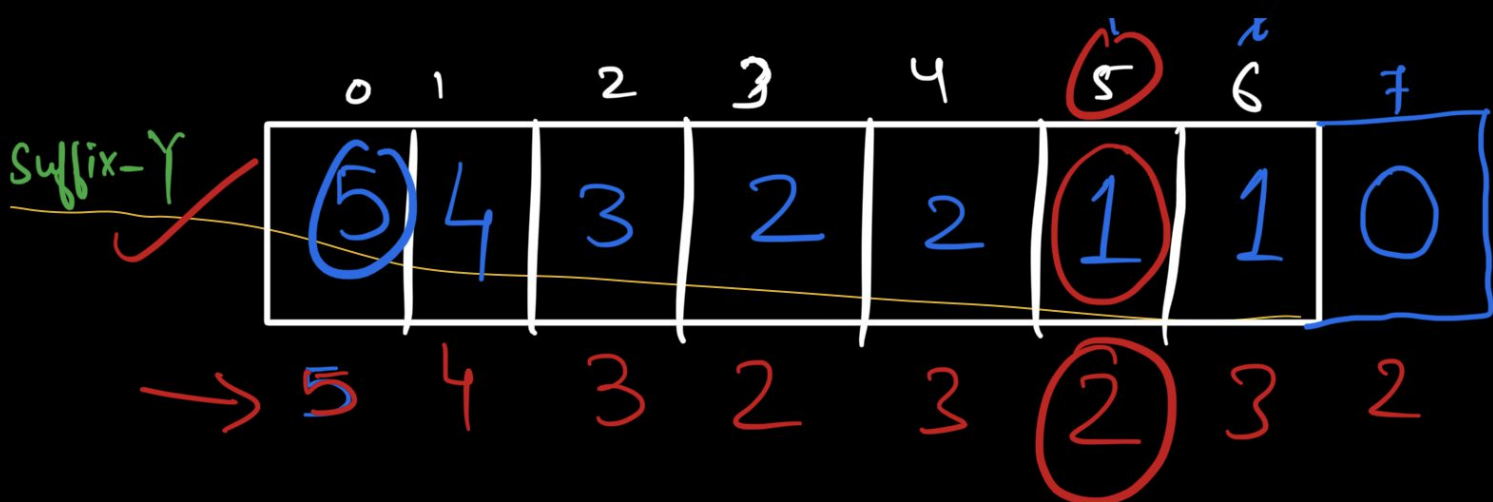
Better Approach

	0	1	2	3	4	5	6	7
Cust	Y	Y	Y	N	Y	N	Y	

	0	1	2	3	4	5	6	7
Prefix-N	0	0	0	0	1	1	2	2

	0	1	2	3	4	5	6	7
Suffix-Y	5	4	3	2	2	1	1	0
	5	4	3	2	3	2	3	2





```
for (int i = 0; i <= n; i++) {
```

Pen: =  $P_{i-1}(i) + \text{su-}\gamma(i);$

}

$O(n)$  Space  
 $O(n)$

Accepted. T.C :  $O(n)$  ✓

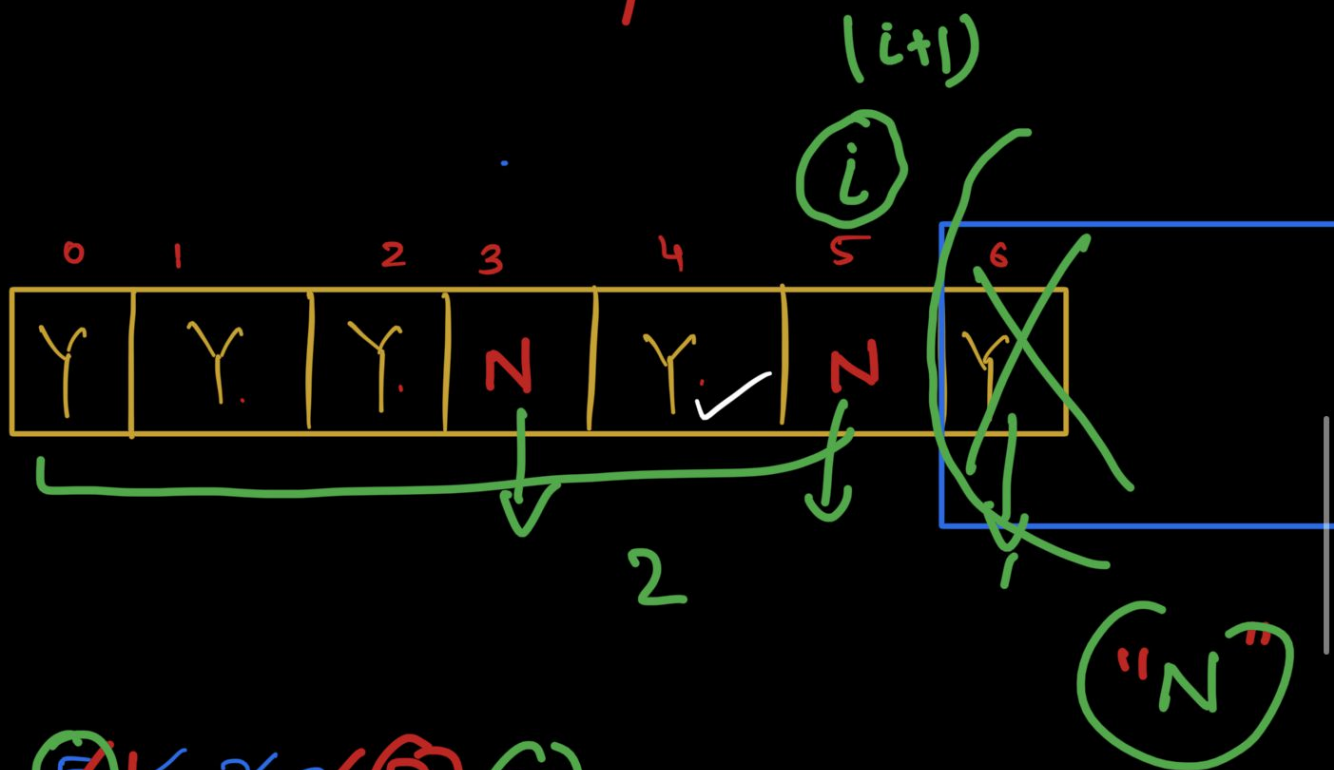
→ S.C :  $O(n)$  ✓

∴ I hate you  $O(n)$  space

Can we solve it in

Can we solve it in  
 $O(1)$  space ???

हाँ भाई।



Penalty = ~~5~~ ~~4~~ ~~3~~ ~~2~~ **(3)** **(2)**      Penalty = **(3)**  
 Howr = ~~0~~ ~~1~~ ~~2~~ 3 4      Howr =

minPe = 2  
 minHowr = 3

CS

i = 0 to n

50

$i = 0 \rightarrow n$

if (char[i] == 'Y')

Penalty --

else

Penalty ++

if (Penalty < minP) {

minP = P.

minI = i + 1;

}