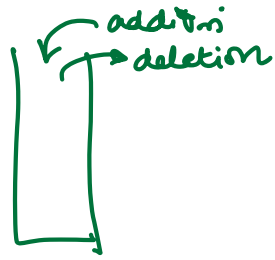
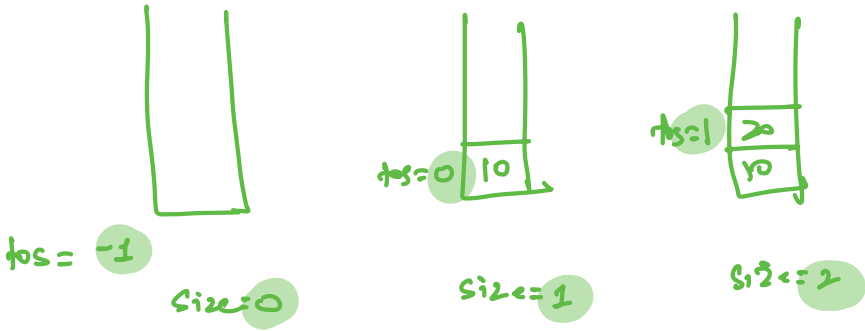
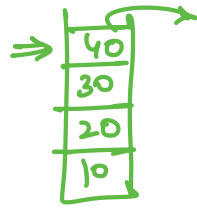


Stack DS



LIFO (Last In First Out)



Valid Parenthesis:

[] () { }

" [() () { }] "

" [({] " X
 round close

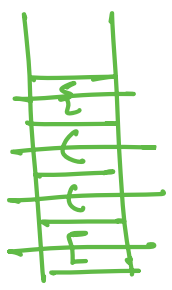
- round open = 2
- round close = 2
- square open = 1
- square close = 1
- curly open = 1
- curly close = 1

" [) () ({ }] " X

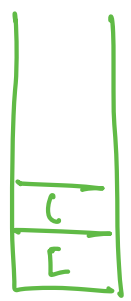
[() () { }]

[({]

① incorrect bracket



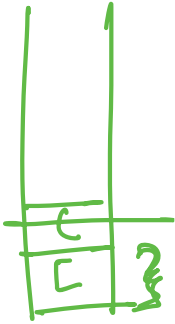
stack empty → valid



ch = '}' & top() = 'C'

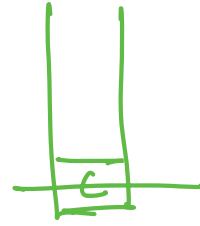
⇒ } corresponding open X
 not valid

② open > close
 " [() " string over

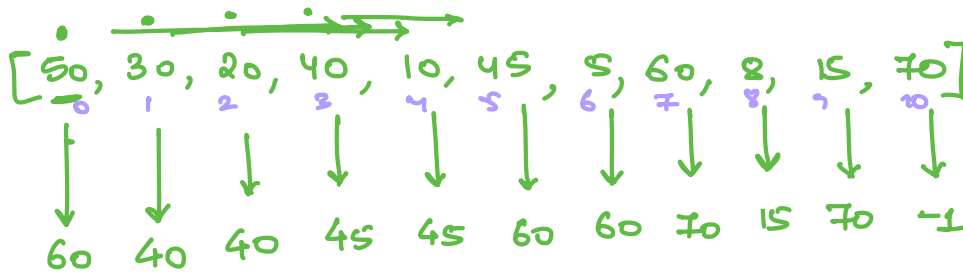


③ close > open

" ()] " closing bracket



Next Greater Element

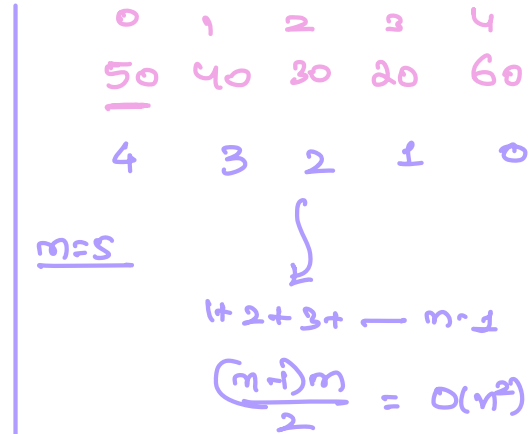


Brute force:

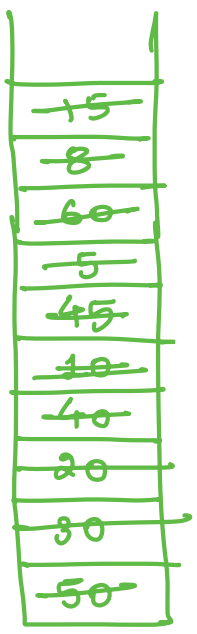
```

for (int i=0; i<=n-1; i++)
{
    int j=i+1;
    for (; j<=n-1; j++)
    {
        if (arr[j]>arr[i])
            break;
    }
    if (j==n)
        cout<< arr[i] << "→" << -1;
    else
        cout<< arr[i] << "→" << arr[j];
}

```

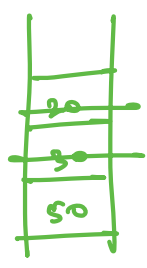


\downarrow 50 \downarrow 30 \downarrow 20 \downarrow 40 \downarrow 10 \downarrow 45 \downarrow 5 \downarrow 60 \downarrow 8 \downarrow 15



20 → 40
 30 → 40
 10 → 45
 40 → 45
 5 → 60
 45 → 60
 50 → 60
 8 → 15
 15 → -1
 60 → -1

new element
 for which nos can I
 act as the next
 greater element.



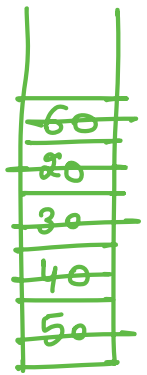
$\begin{matrix} 40 \\ \parallel \\ \hookrightarrow arr[i] \end{matrix}$

20 < 40 ?
 20 → 40
 30 < 40 ?
 30 → 40
 50 < 40 ? X

TC Analyse:

0	1	2	3	4
50	40	30	20	60
Push	Push	Push	Push	Push
Pop	Pop	Pop	Pop	Pop

n push: n TC
 n pop: n TC⁺ = 2n
 = O(n)

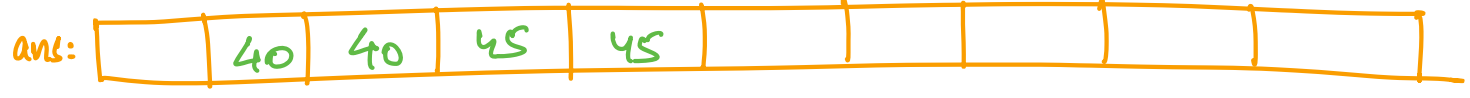


20 → 60
 30 → 60
 40 → 60
 50 → 60
 60 → -1

1 Push } O(1)
 1 Pop }

0 1 2 3 4 5 6 7 8 9
 50 30 20 40 10 45 5 60 8 15

index → value easy i arr[i]



Stack indexes insert instead of values index → value mapping
 ans array create NGE store
 finally ans array print.

10	4
40	3
20	2
30	1
50	0

Indices

index 1: 30
 index 2: 20
 index 3: 40
 index 4: 10
 index 5: 50

$20 \rightarrow 40$ ✗
 ans array store

Index
 ↓
 value

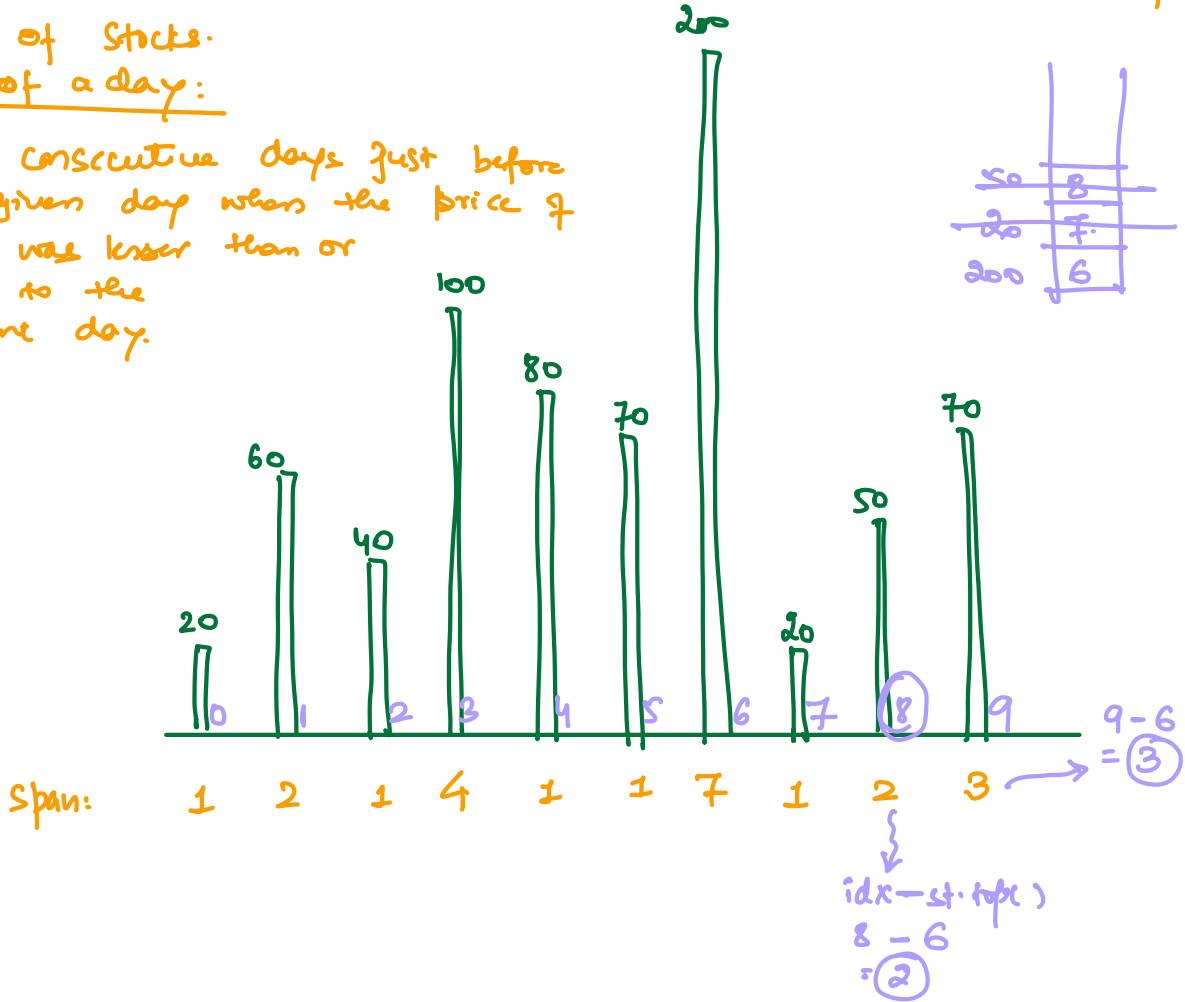
Stock Span

Prices of Stocks.
Span of a day:

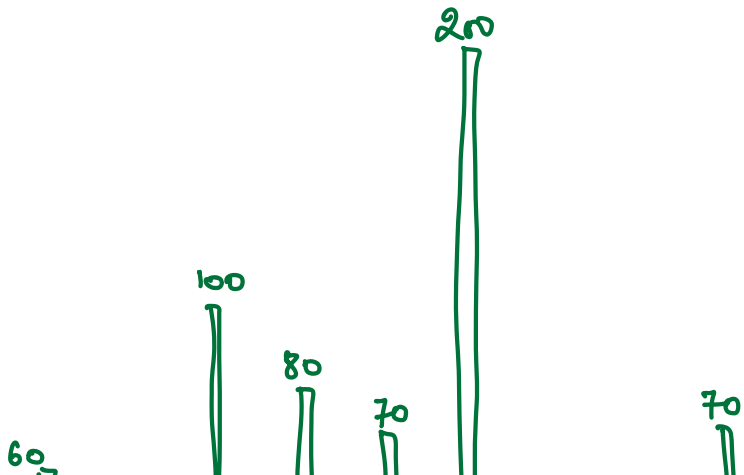
no. of consecutive days just before this given day when the price of stock was lesser than or equal to the current day.



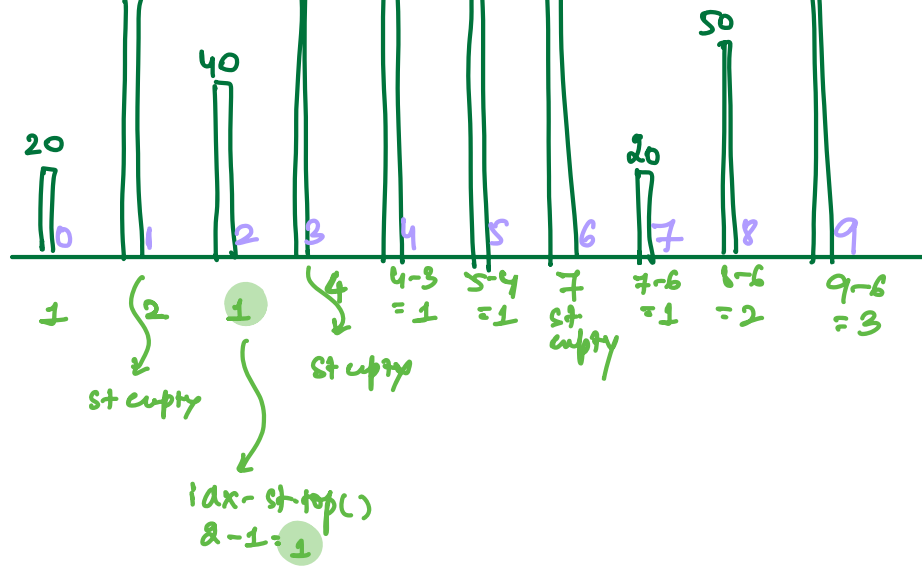
50	8
20	7
200	6



50	8
20	7
200	6



200	6
170	5
140	4
100	3
40	2
60	1
20	0



[Stack Q's]
 Queue
 LL, LLQ's

2hr 2pm