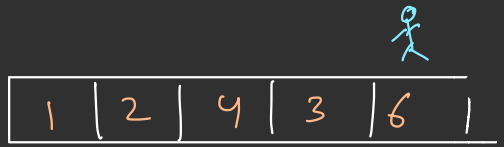
L25
Arrays - Practice 5

*Stay tuned for the System Design Course Announcement.*

Join Discord - https://bit.ly/ly-discord

# RECAP




4

6

10

10

$2x - cuss\_num$

$n$

$+$

$n-1$

$+$

$n-2$

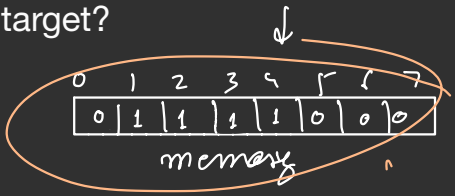
$+$

$n-3$

$\vdots$

$1$

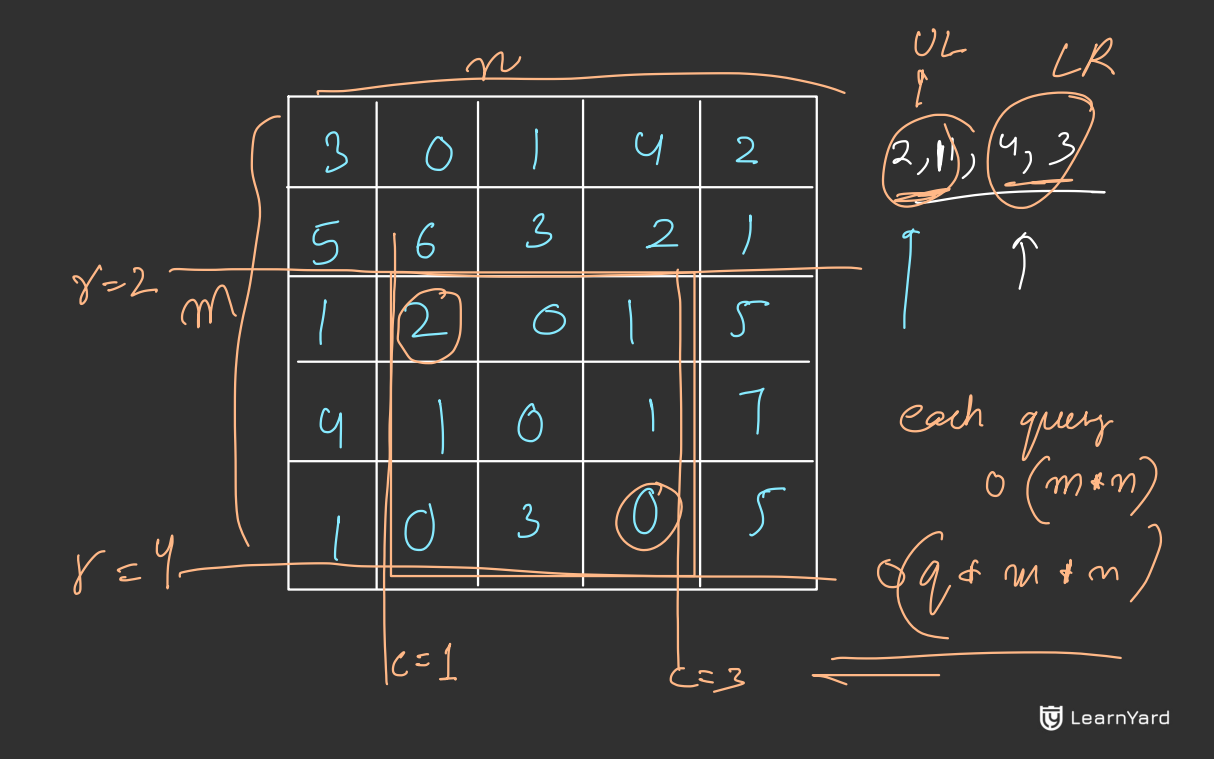
Is there a pair of elements with sum equal to a given target?

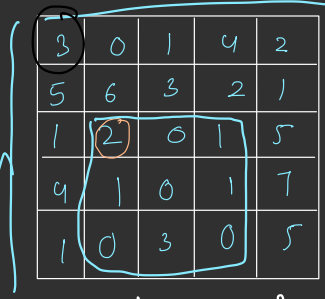



$1+2+3+\dots+n-1+n$

$O\left(\frac{n \times (n+1)}{2}\right) = O(n^2)$

# Range Sum Queries - 2D


n
m
r=2
r=4
c=1
c=3
3 0 1 4 2
5 6 3 2 1
1 2 0 1 5
4 1 0 1 7
1 0 3 0 5
UL
LR
2,1
4,3
each query
O(m*n)
O(q*m*n)




| | | | | |
|---|---|---|---|---|
| 3 | 3 | 4 | 8 | 10 |
| 5 | 11 | 14 | 16 | 17 |
| 1 | 3 | 3 | 4 | 9 |
| 4 | 5 | 5 | 6 | 13 |
| 1 | 1 | 4 | 4 | 9 |

→ pre-sum

r=2

r=4

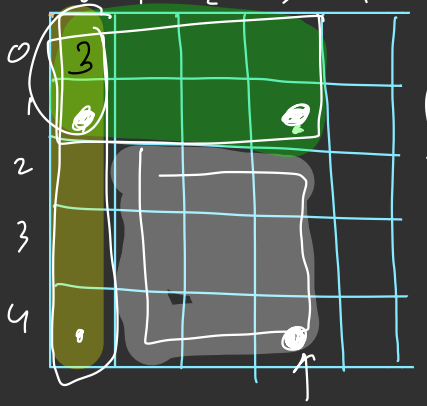
c=1 c=3

right

pre_sum[2][3] - pre_sum[2][0]  (left-1)

O(m)

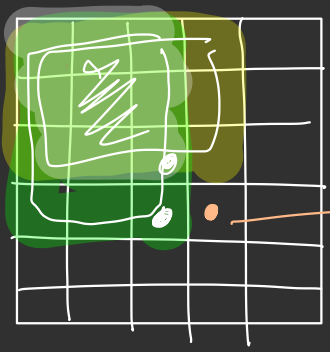
O(q, m)




r0 c0  r1 c1

pre_sum[4][3] - pre_sum[1][3] - pre_sum[4][0]
+ pre_sum[1][0];

pre_sum[r1][c1] - pre_sum[r0-1][c1] - pre_sum[r1][c0-1]
+ pre_sum[r0-1][c0-1];




pse_ans[i][j] = pse_ans[i][j-1] + pse_ans[i-1][j]
- pse_ans[i-1][j-1] + matrix[i][j];

# Thank You!

Reminder: Going to the gym & observing the trainer work out can help you know the right technique, but you'll muscle up only if you lift some weights yourself.

So, PRACTICE, PRACTICE, PRACTICE!