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DP Concepts

video
29

&

Questions



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I will give you



codestorywithMIK
માણસ
(Motivation)

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Life will give you
many opportunities.
Grab them and never
take them for granted... ”

eswithMIK → 1w111

Facebook
Instagram] → code story with MIK
whatsapp → codestory with MIK

Done

1-D based DP

Grid based DP

Done

String based DP

Digit DP

We'll do:-

(i) RECURSION
+
MEMOIZATION
(Top Down)

(ii) Bottom UP .

DP on Grids

☆ If you've ever been confused by grid-based DP problems, You are in the right place.





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★ I will start from fundamentals that
will help you get started ...

What is DP on grids ???

→ Techniques to solve problems that involve
moving through a grid, often a 2D matrix.



→ Each position /cell in the grid

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moving through a grid, often a 2D matrix.

→ Each position / cell in the grid

Some value

- cost ✓
- Reward ✓

etc...

- फलाना / टिप्पकाना

Goal

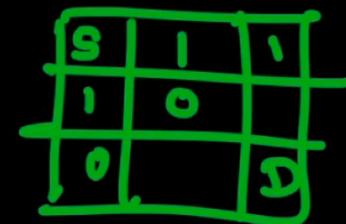
- Find optimal Path ✓
- Find optimal value ✓

etc...

- optimal फलाना / टिप्पकाना

Some typical examples :-

- Finding minimum / maximum path sum in grid.
- Number of ways to reach a cell .
- With constraints .
Example → Avoiding obstacles etc...

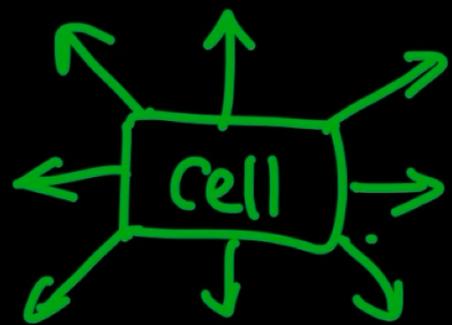




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Grid Movements :-



Left
Right
Up
Down
Diagonally

i
j
→ Make sure
to understand
from problem
statements.

Object Eraser



How DP Fits in ???

CORE IDEA :-

Solve a problem by breaking it down into subproblems

Memoize the subproblems

{ Solve a problem by breaking it down into subproblems

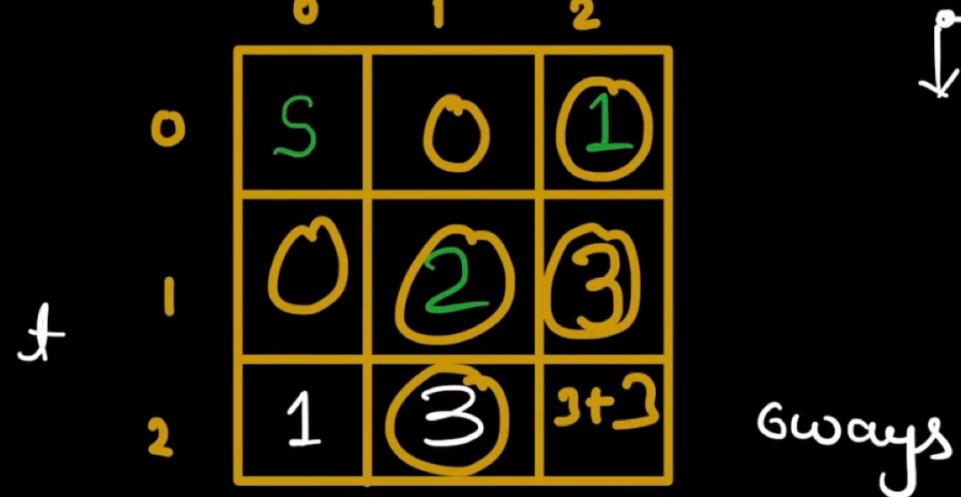
↓

Memoize the subproblems

{ # Each cell → can represent a state/subproblem.

Key idea is to compute the result for a given cell based on previously computed results of neighboring cells.

Example :-



$f[i][j]$ = no. of ways to reach $(i)[j]$
from source

$$f[2][2] = f[1][1] + f[1][2]; \\ 3 + 3 = 6$$

We will cover many Qns
as we go ahead :-

The more you solve, the better you get...
#

~~✓~~ Unique Paths - I / II

✓ Minimum Path Sum in a Grid.

✓ Number of unique paths from top left to bottom right in Grid.

✓ Number of unique paths from top left to bottom right in Grid
with obstacles.

• Longest Increasing path in a grid. e

⋮

✓ Unique Paths - I / II

grid DP

✓ Minimum Path Sum in a Grid.

✓ Number of unique paths from top left to bottom right in Grid.

✓ Number of unique paths from top left to bottom right in Grid
with obstacles.



Many More

...

जैसे

Graph, Trie etc.

का डर नाया,

डेस्कों मी डर भगाऊंगा / ...

Promise



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