You are climbing a staircase. It takes n steps to reach the top. Each time you can either climb 1 or 2 steps. In how many distinct ways can you climb to the top?

CODE:

def climbStairs(n):

if n == 1:

return 1

if n == 2:

return 2

# Initialize an array to store the number of distinct ways for each step

dp = [0] \* (n + 1)

# Base cases

dp[1] = 1

dp[2] = 2

# Calculate the number of distinct ways for each step using dynamic programming

for i in range(3, n + 1):

dp[i] = dp[i - 1] + dp[i - 2]

return dp[n]

# Taking user input for the number of steps

n = int(input("Enter the number of steps: "))

# Finding and displaying the number of distinct ways to climb the staircase

ways = climbStairs(n)

print(f"There are {ways} distinct ways to climb the staircase with {n} steps.")

OUTPUT:

Enter the number of steps: 5

There are 8 distinct ways to climb the staircase with 5 steps.

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