

Problem: 给定 n 求得第 n^{th} 个 Catalan Number

idea: $C_0 = 1$ 且 $C_{n+1} = \sum_{i=0}^n C_i \cdot C_{n-i} \quad \forall n \geq 0$

Algorithm: Catalan_Number(n)

Let $A[0, \dots, n]$ be a new array

$A[0] = 1$

for $i = 1$ to n

for $j = 0$ to $i-1$

$A[i] += A[j] \times A[i-1-j]$

return $A[n]$