

Do Be So Naïve

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Consider the following recurrence:

$$A(i, j) = \begin{cases} 1 & \text{if } i = 1 \\ A(i - 1, j + 1) + A(i - 1, j) & \text{otherwise} \end{cases}$$

1. Give naïve recursive code that computes the value of $A(n, 1)$ for $n \geq 1$.
2. Give an asymptotic bound on the **runtime and memory use** of a memoized version of this algorithm. (Assume that storing one value of A takes constant space.)
3. Write clear (pseudocode) nested loops to specify an order could solve the subproblems to convert this to a dynamic programming solution. (There is no need to write the initialization code for the function or the body that would actually solve the problem.)

