

DESIGN AND ANALYSIS OF ALGORITHMS ASSIGNMENT 1

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Assign: Find space complexity of
Alg test(n) {
 if ($n > 0$) {
 print n ;
 test($n - 1$)
 test($n - 1$)
 }
 }

 $T(n) = \{$ $n=0$

 $T(n) = 1 + T(n-1) + T(n-1)$
 $T(n) = 2T(n-1) + 1$

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$$T(n) = \begin{cases} 1 & n=0 \\ 2T(n-1) + 1 & n>0 \end{cases}$$

$$T(n) = 2T(n-1) + 1$$

$$a = 2$$

b = 1

$$f(n) = 1$$

Since $a > 1$;

$$f(a) = 0$$

$$T(n) = O(fcn \cdot a^{\frac{n}{b}})$$

$$T(n) = O(1 \cdot 2^{\frac{n}{4}})$$

$$T(n) = O(2^n)$$

Space complexity

assume $n = 3$

size of stack

$$S(n) = O(n)$$

