

5/5

COS 488 Problem Set #2 Problem #1

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$$a_n = \frac{n}{n+1}a_{n-1} + 1$$
$$(n+1)a_n = na_{n-1} + n + 1$$

Expanding out na_{n-1} recursively gives $(n+1)a_n = a_0 + \sum_{i=1}^n (i+1) = 1 + \frac{(n+1)(n+2)}{2} - 1$ so $a_n = \frac{n+2}{2}$.