


**4.3-1.**

Show that the solution of  $T(n) = T(n-1) + n$  is  $O(n^2)$ .

**Answer.**

$$\begin{aligned} T(n) &= T(n-1) + n \\ &= T(n-2) + (n-1) + n \\ &= T(n-3) + (n-2) + (n-1) + n \\ &= \dots \\ &= T(0) + 1 + 2 + \dots + (n-1) + n \\ &= T(0) + \frac{n(n+1)}{2} \\ &= O(n^2) \end{aligned}$$

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