

Please use [Substitution method](#) to find Big-O of this recursion . .

$$\begin{aligned} T(n) &= 0 && \text{if } n = 1 \\ T(n) &= T(n-1) + n - 1 && \text{if } n \geq 2 \end{aligned}$$

$$T(1) = 0$$

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

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

$$T(n-2) - T(n-3) = n - 3$$

....

$$T(3) - T(2) = 2$$

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

$$\text{Sum(Left hand side)} = T(n) - T(1) = T(n)$$

$$\text{Sum(Right hand side)} = [1 + (n-1)] * (n-1) / 2 = n * (n-1) / 2$$

$$\text{Thus, } T(n) = n * (n-1) / 2$$

$$\text{Thus, Big-O} = O(n^2)$$