

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

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

$$= T(n-3) + (n-2) + (n-1) + n$$

...

$$T(n) = T(n-k) + (n-k+1) + \dots + n$$

$$\dots = \sum_{i=1}^n i = 0.5 * n * (n - 1) = O(n^2)$$