

# Recurrences

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1.  $T(n) = 2n * T(n - 1)$ . Base condition  $T(0) = 1$

$$\begin{aligned}T(n - 1) &= 2n * T((n - 1) - 1) \\&= 2n * 2n * T((n - 1 - 1) - 1) \\&= 2n * 2n * 2n * T((n - 1 - 1 - 1) - 1) \\&= 2n^k * T(n - k) \\&= 2n^n T(0)\end{aligned}$$

2.  $T(n) = T(n - 1) + n$ . Base condition  $T(0) = 0$

$$\begin{aligned}T(n - 1) &= T((n - 1) - 1) + n \\&= T((n - 1 - 1) - 1) + n + n \\&= T((n - 1 - 1 - 1) - 1) + n + n + n \\&= T(n - k) + k * n \\&= n^2 T(0)\end{aligned}$$