- 문제 2: $T(n) = T(n-1) + n$

$T(0) = 1$

$T(1) = T(0) + 1$

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

$\vdots$

$+$

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

$T(n) = 1 + 2 + \cdots + n$

$= \frac{n(n+1)}{2} \rightarrow O(n^2)$

- 문제 4: $T(n) = T\left(\frac{n}{2}\right) + 1$

$T(1) = 1$

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

$T(4) = T(2) + 1$

$T(8) = T(4) + 1$

$\vdots$

$+$

$T(n) = T\left(\frac{n}{2}\right) + 1$

$T(n) = \log_2 n + 1 \rightarrow O(\log n)$

- 문제 6: $T(n) = 2T\left(\frac{n}{2}\right) + n$

$\frac{T(n)}{n} = \frac{2}{n} \cdot T\left(\frac{n}{2}\right) + 1$

$T(1) = 1$

$\frac{T(2)}{2} = T(1) + 1$

$\frac{T(4)}{4} = \frac{T(2)}{2} + 1$

$\frac{T(8)}{8} = \frac{T(4)}{4} + 1$

$\vdots$

$\frac{T(n)}{n} = \frac{2}{n} \cdot T\left(\frac{n}{2}\right) + 1$

$\frac{T(n)}{n} = \log_2 n + 1$

$T(n) = (\log_2 n + 1)\, n$

$\rightarrow O(n \log n)$

- 문제 8: $T(n) = T(n-1) + \frac{1}{n}$

$T(1) = 1$

$T(2) = T(1) + \frac{1}{2}$

$T(3) = T(2) + \frac{1}{3}$

$\vdots$

$T(n) = T(n-1) + \frac{1}{n}$

$T(n) = \sum_{K=1}^{n} \frac{1}{K} \leq 1 + \int_1^n \frac{1}{x} dx = 1 + \log n - \log 1 = 1 + \log n$

$\rightarrow O(\log n)$