Q1. 20230563 김홍근

$3\log n + 5$: Big-O : $O(n)$.

2^{10} : Big-O : $O(1)$.

2^n : Big-O : $O(2^n)$.

$4n + 8\log n$: Big-O : $O(n)$.

$5n + 32$: Big-O : $O(n)$.

$n^3 + 4n^2$: Big-O : $O(n^3)$.

3^n : Big-O : $O(3^n)$.

$2^{\log n} = n^{\log 2} = n$: Big-O : $O(n)$

$\log n^{3n} = 3n\log n$: Big-O : $O(n\log n)$

$n!$: Big-O : $(n!)$

답: 2^{10}, $2^{\log n}$, $3\log n + 5n$, $4n + 8\log n$, $5n + 32$, $n^3 + 4n^2$, 2^n, 3^n, $n!$

Q2

1) $T(n) = c_3 + c_4 + \sum_{i=0}^{n-1} \sum_{j=0}^{10} (c_1 + c_2)$

$= 10(c_1 + c_2)\, n + c_3 + c_4.$

$T(n) \in O(n)$. 12

2) $T(n) = c_1 + c_2 + \sum_{i=0}^{n-1} (c_3 + c_4)$

$= (c_3 + c_4)\, n + c_1 + c_2.$

$T(n) \in O(n)$. 12

Q3.

1) $T(n) = c_1 + \sum_{i=0}^{n-1} c_2(n-i-1)$

$= c_1 + c_2(n-1)\sum_{i=0}^{n-1} 1 - c_2 \sum_{i=0}^{n-1} i$

$= c_1 + c_2 \cdot n(n-1) - c_2 \frac{n(n-1)}{2}$

$= \frac{c_2}{2} n^2 - \frac{c_2}{2} n + c_1$

$T(n) \in O(n^2)$. ☒

2) $T(n) = c_1 + c_2 + c_4 + \sum_{i=0}^{n-1} c_3$

$= c_3 n + c_1 + c_2 + c_4$.

$T(n) \in O(n)$. ☑