

HW 2 # 3

Big O

1. $O(1)$
2. $O(5)$
3. $O(\frac{1}{N})$
4. $O(\log N)$
5. $O(\sqrt{N})$
6. $O(N)$
7. $O(N^{1.5})$
8. $O(N \log N)$
9. $O(NM)$
10. $O(N^2)$
11. $O(2^N)$
12. $O(\infty)$

i. $sum = 0$ ①
 for ($i = 0$ ①; $i \leq n$ ①; $i++$) {
 $sum++$ ①
 }
 $= 1 + 1 + n + 1 = 3n + 2 = O(n)$

ii. $sum = 0$ ①
 for ($i = 0$ ①; $i \leq n$ ①; $i++$) {
 for ($j = 0$ ①; $j \leq i$ ①; $j++$) {
 $sum++$ ①
 }
 }
 $= 1 + (2n+1)(3n+1) = 6n^2 + 5n + 1 = O(n^2)$

iii. $sum = 0$ ①
 for ($i = 0$ ①; $i \leq n$ ①; $i++$) {
 for ($j = 0$ ①; $j \leq i$ ①; $j++$) {
 $sum++$ ①
 }
 }
 $= 1 + (2n+1)(3n+1) = 6n^2 + 5n + 1 = O(n^2)$

$$IV \quad \sum_{i=1}^n = 0$$

$$\text{for } C=0; i \leq n \cdot n; i++ \{$$

$$\text{for } C=0; j \leq n^2; j++ \{$$

$$\sum_{i=1}^n H_{i/n}$$

$$\sum \sum$$

$$= 1 + (n^2 + n + 1) (1 + (n^2 + 2n))$$

$$= C(n^4)$$