

$N \log N$

2.1. $\frac{2}{N}, 37, \sqrt{N}, N, N \log \log N, N \log(N^2), N \log^2 N, N^{1.5},$
 $N^2, N^2 \log N, N^3, 2^{N/2}, 2^N.$

($N \log N$ and $N \log(N^2)$ grow at the same rate)

2.6 a. 2^{2^N}

b. $O(\log \log D)$

2.7 (1) $O(N)$

(5) $O(N^5)$

(6) $-O(N^4)$

- the "if" is executed at most N^3 times, but is only true $O(N^2)$ times. Thus the innermost loop is only executed $O(N^2)$ times.

$$T(N) = T(N-1) + C_2 N$$

$$= T(N-2) + C_2(N-1 + N)$$

$$= T(N-3) + C_2(N-2 + N-1 + N)$$

$$\vdots$$

$$= T(i) + C_2 \sum_{j=i+1}^N j$$

$$\vdots$$

$$= T(1) + C_2 \sum_{j=2}^N j$$

$$= PC_1 + C_2 \left(\frac{N(N+1)}{2} - 1 \right)$$

$$= C_1 + C_2(N^2 + \dots)$$

$$= \Theta(N^2)$$

ANSWER