

1. Problem 1-1 (p15)

Table 1: Comparison of Running Times

$f(n)$	1 second	1 hour
$\log n$	$2^{1,000,000}$	$2^{3,600,000,000}$
$\sqrt{n}$	$1 \cdot 10^{12}$	$1.296 \cdot 10^{19}$
$n$	$1 \cdot 10^6$	$3.6 \cdot 10^9$
$n \log n$	62,746	$1.334 \cdot 10^8$
$n^2$	1,000	60,000
$n^3$	100	1,532
$2^n$	20	31
$n!$	9	12

2. Exercise 2.3-4 (p44)

Prove that when  $n/geq2$  is an exact power of 2, the solution of the recurrence

$$T(n) = \begin{cases} 2 & n = 2, \\ 2T(n/2) + n & n > 2 \end{cases}$$

is  $T(n) = n \log n$ .

3. Problem 2-3 (p46)
4. Exercise 3.2-2 (p62)
5. Exercise 3.2-6 (p63)
6. Using the substitution method, show that the solution of  $T(n) = T(\lceil n/2 \rceil) + 1$  is  $O(\log n)$ .
7. Exercise 4.5-1 (a, b, d, e) (p106)
8. Exercise 4.5-2 (p106)
9. Exercise 5.2-1 (p133)

10. Exercise 5.2-2 (p133)

11. (EC) Problem 4-6 (p122)