

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 $n/2$ 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)