Chap 1. Basic Concepts

C Pointers & Dynamic memory allocation

- Pointers // § 1.2.1
- Program 1.1: allocation and deallocation of memory
- MALLOC(p,s) macro // § 1.2.2
  - Definition
  - Examples

Algorithm specification

- Algorithm
  - Definition // § 1.3.1
- Example 1.1 [Selection sort]
- Program 1.2: selection sort algorithm
- Program 1.4: selection sort
  - SWAP(x, y, z) macro
  - Program 1.3: swap function

Binary search (이진 탐색)

- Example 1.2
- Program 1.5: searching a sorted list
  - Program 1.6: comparison of two integers
  - COMPARE(x,y) macro
- Program 1.7: searching an ordered list

Recursion

- Recursive function (재귀적 함수)
- Example: Factorial(n)
- Example 1.3: Binary search
- Program 1.8: recursive implementation of binary search
- Towers of Hanoi: § 1.3.2 Exercises 11번

Data Abstraction

- Data type
  - Definition // § 1.4
- Abstract data type
  - Definition // § 1.4
  - Example 1.5 [abstract data type NaturalNumber]
  - ADT 1.1: abstract data type NaturalNumber

Performance Analysis

- Space complexity and time complexity
  - Definition // §1.5
- Time complexity
  - program step: Definition // §1.5.2
  - steps/execution(s/e): step count for each statement
  - frequency
  - Figure 1.2: step count table for program 1.11
  - Figure 1.3: step count table for recursive summing function (for program 1.12)
    - 오타: in Figure 1.3
    - program 1.12가 정확
  - Figure 1.4: step count table for matrix addition (for program 1.16)

Big “oh” Notation

- Definition // § 1.5.3
- Example 1.15
- O(*log* n), O(n), O(n *log* n), $O(n^2)$, $O(n^3)$, $O(2^n)$
- O(1)
- Figure 1.7: function values
- Figure 1.8: plot of function values
- Limitations