資料結構筆記 1107/2/28 王紫葉

Unit 1 遞迴 recursion

⇒ 功用：把大問題中重複的步驟化繁為簡.

⇒ 實用例子：階層 Factorial
二元搜尋 Binary Search
河內塔 Towers of Hanoi

⇒ Greatest Common Divisor (GCD) :

def: gcd1(x, y) = x if y=0
= gcd1(x, y mod x) if y>x
= gcd1(y, x mod y) otherwise

Unit 2 Data Abstraction

⇒ Class 類別 {
Attributes of objects of a single type, called data members
Behaviors, called methods or member functions

⇒ OOP characteristics {
Hides inner details
Existing classes can be reused
objects can determine appropriate operations at execution time

⇒ Operation Contract for the ADT List

insert (in index : integer
, in newItem : ListItemType, out success : boolean)

remove (in index : integer, out success : boolean)

Unit 3 Linked Lists

⇒ Comparing Array-Based and Pointer-Based Implementation

	Array	Pointer
Size	waste storage and time	grows and shrinks as necessary
Storage requirement	requires less memory ←	
retrieval (time to access the i^{th} item)	Constant	Depends on i
Insertion & deletion	requires shifting of data	requires a traversal

U4 - Basic of Grammars

Algebraic Expressions

- 前序 prefix +ab
- 中序 infix a+b
- 後序 postfix ab+

- Backtracking : involves both recursion and a sequence of guesses that ultimately lead to a solution.