

國立屏東科技大學八十九學年度碩士班招生考試 資 料 結 構 試 題

- 試以遞迴 (Recursive) 演算法 (Algorithm) 處理河內塔 (Tower of Hanoi) 問題 (i.e., n is the number of moving ring, A is the start peg, B is the intermediate peg, C is the final peg) (10 分).
- 設有一 recursive procedure 如下:
Recursive Procedure FIB(n)
begin
 If $n=0$, FIB=0
 If $n=1$, FIB=1;
 else FIB(n)=FIB($n-1$)+FIB($n-2$)
end
請問
 (1) FIB(5)之值=? (5 分)
 (2) 計算 FIB(5)之值需呼叫 (call) 此 procedure 幾次? (5 分)
 (3) 試將此 recursive procedure 改寫成 nonrecursive procedure (10 分).
- (1) 何謂 Recursive procedure? (5 分)
 (2) 試以 Recursive Method 寫一 procedure, 計算 $N!$ ($N! = N \cdot (N-1) \cdot (N-2) \cdot \dots \cdot 2 \cdot 1$), 其中 N 為正整數. (5 分)
- 試以快速排序法 (quick sort) 來重新排列下列資料:
7, 4, 14, 8, 6, 11, 8⁺, 5 (以 "+" 記號區分兩相同鍵值) (10 分)
- Convert the following infix expression into
 (1) tree
 (2) postfix
$$A - B * (-C + -8.5) \quad (10 \text{ 分})$$
- 試寫一 STACK 加入 (insert, push) 之演算法 (Algorithm). (10 分)
- 若二元樹(Binary tree)之深度(depth)為 n , 試推導並求出此二元樹的最多節點數目為何? (5 分)
- On an ordered file with keys (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16), use Fibonacci search to determine the number of key comparisons made while searching the keys 7 and 10. (We need three Fibonacci number $F_5=5$, $F_6=8$ and $F_7=13$) (10 分)
- 試分別以 Prim's method 及 Kruskal's method 得出下圖之 minimum cost spanning tree, 其 cost = ? (15 分)

