

考試科目	資料結構	系所別	資訊管理學系/科技組	考試時間	2月5日(五) 第四節
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- I. (45%) Consider the following keys: 2, 4, 26, 25, 13, 14, 51, 9, 17, 43, 68
1. (15%) Insert the keys into a min heap one by one. Reconstruct the heap when it violates the heap order (for all node  $v$ ,  $v.key > v.parent.key$ ). Show each step and the final result.
  2. (15%) Insert the keys into a hash table that handles collision with double hashing.  
Let  $N=17$ .  $h(k) = k \bmod 17$ .  $d(k) = 13 - k \bmod 13$ . Show each step and the final result.
  3. (15%) Insert the keys into an AVL tree one by one. Reconstruct the AVL tree when it violates the AVL property (for all node  $v$ ,  $|v.leftsubtree.height - v.rightsubtree.height| \leq 1$ ). Show each step and the final result.
- II. (25%) To sort the above keys in I, describe a sorting algorithm
1. (10%) that uses the heap constructed in I.1
  2. (15%) that uses the AVL tree constructed in I.3
- III. (30%) Describe an algorithm to evaluate the expression  $13 + 5 - 6 * 3 < 4 - 6 + 9 / 3$
1. (15%) that uses recursive call on the binary tree representation of the expression
  2. (15%) that uses two stacks for operators and operands (values) respectively

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註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。