

考試科目	資料結構	系所別	資管系	考試時間	二月六日(二)第四節
------	------	-----	-----	------	------------

Consider the following key set: 1, 8, 4, 53, 12, 7, 35, 103, 16, 14, 63, 29, 20, 72, 38, 18, 22, 56

### Sorting with a Heap

- (15%) Build a Max-Heap using an array with the bottom-up construction. Show the construction step by step.
- (15%) Define an algorithm that sorts the key set in a heap and analyze its time complexity.

### Sorting with an AVL Tree

- (15%) Build an AVL tree for the above key set
- (15%) Define an algorithm that sorts the key set in an AVL tree and analyze its time complexity.

### Sorting with the Divide and Conquer Algorithm

- (10%) Define a Merge Sort Algorithm and analyze its time complexity by solving its recurrence equation
- (10%) Run the merge sort algorithm with the above key set and show the result step by step.
- (10%) Define a Quick Sort Algorithm with pivot as the first element
- (10%) Run the quick sort algorithm with the above key set and show the result step by step.

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。