

淡江大學八十八學年度碩士班招生考試試題

系別：資訊管理學系

科目：資料結構

本試題共

頁

1. Explain the following terms. (20%)
 - (1) Hashing
 - (2) Binary Search

2. If a circular queue is implemented by an array q of size m , explain why the array q is permitted to hold at most $m - 1$ elements. (10%)

3. Describe the algorithm of the iterative inorder traversal of a binary tree and discuss its time complexity. (20%)

4. We are using heap sort to sort a list of n integers. Please describe how to obtain the result from the original list step by step. You do not have to show the program but state each step as clearly as possible. (20%)

5. 以一二維陣列 $p[x][y]$ 表示一平面, $[x]$ 代表此平面之 x 軸座標, $[y]$ 代表此平面之 y 軸座標. 假設在此平面上有 n 個矩形, 每個矩形以其四個頂點表示之. 例如第 i 個矩形以下列四個座標表示 $((x_{i1}, y_{i1}), (x_{i1}, y_{i2}), (x_{i2}, y_{i1}), (x_{i2}, y_{i2}))$. 其中 (x_{i1}, y_{i1}) 代表其左上角之座標, (x_{i1}, y_{i2}) 代表左下角之座標, (x_{i2}, y_{i1}) 代表右上角之座標, (x_{i2}, y_{i2}) 代表右下角之座標. 如今, 若另給任一矩形 $R : ((x_1, y_1), (x_1, y_2), (x_2, y_1), (x_2, y_2))$, 此四座標與上述定義相同, 代表 R 之四個頂點. 請設計一你認為最佳之方法求所有與 R 重疊之矩形 (注意, 不論重疊部分大小均視為重疊). 請詳細說明所需之資料結構及方法並分析此方法之複雜度 (complexity). (30%)