

Data Structure

Homework 8

Due date 12/28 (23:55)

- 題意說明

Implement a program for managing the products in a store by constructing a linked-based *binary search tree*.

- 程式功能要求

1. The store keeps the following information for each product.
 - product number (3-digit) (the key of a product)
 - price (integer)
 - amount of the product (integer)
2. The dataset is initially read from a text file. Each line in the file contains the information of a product (separated by spaces). The order of the products in the input file is random. (at least 20 products) (20 分)
3. The program should provide the following functions
 - Search for a product by the product number: Read in the product number and show all the information of the product if the product is found. (10 分)
Press "N" key to show the next product information in increasing order of product number until "R" key is pressed. (10 分)
 - Import products. Read in the product number and the amount.
If the product exists, the amount of the product is increased. Otherwise, read in the data of the product and insert the product into the tree. (10 分)
 - Delete a product: Read in the product number and delete the product from the tree if the product is found. (10 分)
 - Export products. Read in the product number and amount. The amount of the product is decreased if the product is found and the amount is enough. Show error message if the amount is not enough. (10 分)
For the search, delete, and export functions, if the product does not exist, show error message.
 - List all product information in increasing order of product number. (10 分)

- 擴展功能

1. Add a function to modify the product number of a product. (5 分)
2. Search for a product with the highest price and output its product number. (5 分)
3. Store the information of the products back to the file when ending the program. (The

users can specify the filename of the output file. In addition, the users can specify the file name as the input file when re-running the program to construct the same binary search tree.) (10 分)

- 程式內容需求

1. 必須以指標欄位來建構二元樹。
2. 程式撰寫結構化程度，使用介面輸出入及錯誤訊息提示。
3. 自行設計輸出入介面設計(考慮使用及操作便利性，結果顯示方式是否清楚明瞭)。

- 程式評分標準

1. 符合作業所要求資料結構及正確性(基本功能 80 分，額外功能 20 分)。
2. 程式撰寫結構化及錯誤訊息提示: (5 分)。
2. 書面報告(輸出入介面說明): (5 分)。

on time (-5 分 each day late), at most -30 分(but 補交期限為下次期中考前)。

- Turned in

從 moodle 上傳 (必須附書面報告及 source code), 若需要請配合助教在規定時間內 demo。

☆明顯相互抄襲程式內容(e.g. 只有變數名稱不同者)、未繳交書面報告及無法執行未配合助教 demo 者，以 0 分計算。