## **DSA - Assignment 2**

# Sales and Inventory Management System

## using Binary Search Tree data structure

INTRODUCTION

Your **second assignment in this block** is to use binary search tree data structure for implementing a small Sales and Inventory Management System (SIMS) in Java. SIMS manages information about products and sales ordering items. These information are:

About a product:

1. pcode (string): the code of the product (this is the **key of the tree** and thus should be unique).
2. pro\_name (string): the name of the product.
3. quantity (integer): the number of  products with the same code in a shop at beginning of a day.
4. saled (integer): the number of  products with the same code, which are saled in the day. Condition: saled ≤ quantity.
5. price (double): The price of the product.

About a customer:

1. ccode (string): the code of the customer (this should be unique for the customer).
2. cus\_name (string): the name of the customer.
3. phone (string): The phone number of the customer (must contain digits only).

About ordering:

1. pcode (string): the code of the product to be ordered.
2. ccode (string): the code of the customer.
3. quantity (integer): the number of  ordered products.

YOUR TASKS:

You should use 1 binary search tree to store data for products and 2 linked lists, each one is used to store data for customers or ordering items. You should create the data structures from scratch, do not use structures available in Java:

On running, your program displays the menu as below:

Products (8 marks) (using Binary Search Tree data structure, where bcode is the key of the tree):  
1.1.      Load data from file  
1.2.      Input & insert data  
1.3.      In-order traverse  
1.4.      Breadth-first traverse  
1.5.      In-order traverse to file  
1.6.      Search by pcode  
1.7.      Delete by pcode by copying  
1.8.      Simply balancing  
1.9.      Count number of products

Customer list (1 mark):  
2.1.      Load data from file  
2.2.      Input & add to the end  
2.3.      Display data  
2.4.      Save customer list to file  
2.5.      Search by ccode  
2.6.      Delete by ccode

Order list (1 mark):  
3.1.      Input data  
3.2.      Display ordering data  
3.3.      Sort by pcode + ccode

Register product arrival: you can edit product details or add stock to the product or remove product that are out of stock. You can search in this table by product description.

Query inventory data: This function reads every row of sales table and displays all of them on the tkinter window.

Sales action (2 marks):  
2.1. Register sale  
2.2. Employees with most sales

2.3. Most sold items

Register sale: you can check the current sale progress in your bakery. You can transaction no., Invoice no. of bakery. You can Search any bill details by Invoice no.

User can also check the date and time of the transaction.

Submission Requirements  
Create the directory with a name like **<class>-<name><roll number>-ASS2**, e.g.  
**SE0508-QuangTV00456-ASS2                        (1)**

Compress the folder (1)to .zip (or .rar) file (with the same name) and upload to cms.

Assignment assessment

You will be asked to modify immediately and to explain your assignment in lab room to be sure that you are really the author of the assignment you submitted.