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DSA - Assignment 2

Bus Booking System

using Binary Search Tree data structure

INTRODUCTION

Your **second assignment in this block** will be using **Binary Search Tree** data structure for implementing a Bus Booking System (BBS) in Java language. BBS manages information about Buses, customers and bus booking. These information are:

About a bus:

1. bcode (string): the code of the bus (this variable is **the key of the tree**, thus it should be **unique** for the bus).
2. bus_name (string): the name of the bus.
3. seat (integer): the number of seats in the bus (**seat > 0**).
4. booked (integer): the number of booked seats in the bus (**booked >= 0** and **booked ≤ seat**).
5. depart_time (double): The departure time of the bus (**depart_time >= 0**).
6. arrival_time (double): The arrival time of the bus (**arrival_time > depart_time**).

About a customer:

1. ccode (string): the code of the customer (this variable 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 Booking:

1. bcode (string): the code of the bus to be booked.
2. ccode (string): the code of the customer.
3. seat (integer): the number of seats to be booked on the bus.

YOUR TASKS

You should use 1 binary search tree to store data for buses and 2 linked lists, each one is used to store data for customers or booking 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 buses

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

Booking list (1 mark):

- 3.1. Input data
- 3.2. Display booking data
- 3.3. Sort by pcode + ccode

Submission Requirements

Create the directory with a name like **<class>-<name><roll number>-ASS1**, e.g.

SE0508-QuangTV00456-AS1 (1)

The (1) directory contains the following files:

1. The run.bat file to run your program.
2. Your source code files.
3. Your input test files (bus.txt and customer.txt).

The statements in run.bat file may be:

```
cls
javac Main.java
java Main
pause
del *.class
```

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.

