Advanced Data Structures 2019 Fall

Bonus Homework

AVL-Tree:

For a given set of data, write a AVL-Tree method to store the data into disks for accomplishing fast data searching using the indexing attribute. The data set HW_Data108.csv is given as your target. Please implement AVL-Tree data structure to store the data set for searching efficiently.

Data set: HW_Data108.csv

The data set contains 5,000 records with attributes in the following schema:

(ID, Item_class, Item, price)

ID(10 chars): `01376753□□`
Item_class (6 chars): `130207`
Item(13 chars): `4710105011011`
price(integer): `52`

For example,

```
00141833  ,130207,4710105011011,52
01376753  ,110217,4710265849066,129
...
```

Operations:

insert(*data_record*): insert a datum (record) into the AVL tree with *key (ID)*.
search(*key*): search records with *key* and return the data content of the record.

The previous operations should be built to store the whole data file HW_Data108.csv with the key ID. Note that the schema of the record has been defined as above.
You have to support the ***insert*** and ***search*** operations both in your system; then, the ***insert*** operation is applied repeatedly to insert the whole data in HW_Data108.csv into your AVL-tree. Finally, you should give user interface of searching data by identifying a specified ID.

Programming and Technical Report:

1. **Cover Title:** AVL-TREE (Your name and student ID must be on the cover, too)
2. **Data structures:** Design all the data structures including the storage structures like the schema structures, index structures which your program used.
3. **Final Input and output operations:** Your final results. Show how to operate your program and complete the search function.
4. **Hand in files:**
   - Source code
   - Execution code (in .exe)
   - Technical report (by word, in .pdf file)