

Assignment 2

Write a program that will allow users the ability to order items from a supermarket online. The Item will consist of three attributes.

- Item Name
- It's category
- Item price

For the Item creation, there must be an item class where objects are part of the **node** which will form the **non-linear trees**. In other terms, the program is made up of **three tree data structures which are 1 binary search tree, 2 heaps and 3 avl and they are all node-based.**

Below is an example of what the item class must include, however more functionality can be added.

```
class item
{
    String itemname;
    string category;
    Int price;

    public:
    item(string, string, int);
    bool operator<(const item&);
    void print();
};
```

The program will implement the three tree data structures as following:

1) A Menu that allow user to choose which non linear structure:

- Binary Search Trees (BST)
- Heaps
- AVL Trees

2) Each tree should have its own mini menu:

The mini-menu has all the operation that are applied the tree structures:

- Add item data,
- Remove item data,

- III. Display the item data normally
- IV. Display all the items sorted by their name ascending
- V. Display all the items sorted by their name descending,
- VI. Display all the items sorted by their prices ascending
- VII. Display all the items sorted by their prices descending.

Note: For Heap, the sorting is done using, Min Heap, Max Heap and Heap sort

3) Read the items from a file or add items manually

To do so you should:

Implement a global

readItems(istream&,tree&) function, which takes the file name and the tree and reads the items in the file into the tree. Consider having the following file as a user reading list to use it for filling your trees.

```
12
chocolate milk
drink
10

bananas
fruit
75

pepsi
drink
20

cheddar cheese
dairy
49
```

```
Tuna  
meat  
90  
  
fanta orange  
drink  
20  
  
yought  
dairy  
13  
  
mint gum  
candy  
2  
  
water  
drink  
9  
  
apples  
fruit  
66  
  
beef  
meat  
284  
  
cheese cake  
desset  
68
```

Rules:

- 1- All the code must be in C++.
- 2- The solution should compile, run without run-time errors, and handle all the cases.

3- Assignment is submitted in teams of 5, and the same group of students as assignment 1.

4- You will upload a zipped folder that contains your code (**Don't include any .exe files in your submission**).

5- Assignment submission is on Google Classroom (No submission through mail).

6- Follow this convention for naming your folder:

ID1_ID2_ID3_A#_G# (i.e

20200111_20200222_20200333_A2_G5_G6)

7- Deadline of the Assignment: 18 May, 2024, at 11:59 p.m.

Any cheating in any part of the assignment is the responsibility of the whole team, and all of the team members will be punished. Failure to follow any of the above rules will result in your submission being discarded and your team being considered to have not submitted