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Program #1 Efficiency Write Up

The first programming assignment was about data abstraction. Data abstraction is a process of building an abstract data type which is ADT. Also the first programming assignment was about exercising building, traversing, and destroying linear linked lists. Our first abstract data type is a data structure that deals with all the informations about stores. This program is structured with two .cpp files and one .h file. Two .cpp files are store.cpp file and main.cpp file where store.cpp file has all the codes about function prototypes that the abstract data type can perform and main.cpp file is a test program, also called client, that has all the codes about communicating with the user, getting the user inputs, pass it to abstract data type, get the results back from abstract data type, and show the results to the user. One .h file which is store.h file is a header file that has all the structures and class interface with public section and private section. Under public section, there are seven function prototypes including constructor and destructor. The function prototypes are adding new store function, adding new item function, removing item function, displaying store with all the items function, and displaying all the items that has same category function. Under private section, there is a declaration of head pointer for store list. Constructor sets head pointer for store list to NULL and all the other pointers and dynamically allocated arrays are under struct so there is no need for setting them to NULL because struct sets them to NULL by default. In destructor, there are two loops that destroy all the dynamically allocated arrays and linear linked lists. This is because there is only one class, struct does not have destructor for its members, so there should be a loop that destroy linear linked list for store and within that loop, there should be another loop that destroy linear linked list for items. In item linear linked list loop, it deletes all the dynamically allocated arrays first, item name, and its category, and then it deletes item node. Same thing applies to the store linear linked list loop, it deletes all the dynamically allocated arrays first, store name, and its website, and then it deletes store node. All the function prototypes are integer type and it returns 1 or 0 in order to communicate with the test program, also called client. Return 1 means success and return 0 means failure. Moreover, all the function prototypes have been tested with all possible cases and everything turned out with expected results. For example, if the user try to add item when there is no store, it does not result segmentation fault, instead, the test program let the user know that the item could not be added. Also main.cpp file which is the test program is structured with one big loop and it gives the menu to the user and the user can choose what

to perform. It repeats over and over until the user wants to quit. Therefore, it makes it possible to test all the possible conditions to test this abstract data type. As I program this first programming assignment, it came out little differently with my expectation and the design write up that I wrote for this programming assignment. Moreover, I did not use any recursive function, everything is done iteratively, and so the whole code is longer than I expected. I needed more practice on class and struct so my main focus was to make it work correctly rather than using recursive functions to make it shorter and make it more efficient. I might need to start practicing more recursion and so I can use recursive functions on next programming assignment and make it more efficient.