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CSCI2270 – Data Structures

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Final Project Report

For my final project I wanted to do something that I care about and might pertain to my future. I have always had a high interest in the cruise industry and wanted to encompass my project around my favorite cruise line, Royal Caribbean. In my project, I decided to use a binary search tree. Inside this tree I wanted it to read a file, that has data about all 26 of Royal Caribbean’s ships. This data includes, the year it hit the seas, the name of the vessel, the capacity of the ship, the destination it is sailing to, the length of the cruise and the price that certain cruise would cost. With this information the user is able to find their dream cruise! They can print their list of cruise options, allowing them to see their availabilities. They then can find a cruise based of a ships name, or even delete an option if that is not what they are looking for. Or, when Royal Caribbean sets sail on their newest ships in 2020, you will have the option to add that ship as well!

This project I had a lot of problems with. I have been having a lot of errors trying to construct the main, to be able to call, read and store the text file in the program. And then be able to use the main menu to print out the inventory of cruises. Once I figured out how to contrast the main file, it then was giving me a problem by printing integers instead of characters. Throughout this process I had many segmented faults and getline errors. For some reason also while I was doing this, my txt file was converting over to an rft file on its own, making it difficult for the program to read the file. Currently my program is working! There are a few bugs that I am trying to grind out before Wednesday night, to make my program perfect! One of the bugs I would like to fix are in my main function, my data structure reads one cruise node as the shipname. This is not okay because I need to parse the information into its correct category.

Additionally, I also wanted to include a trie. I wanted to include a trie because I felt it was something I felt confident in and wanted to include an advanced data structure! In my trie, ships.cpp, I used the names of each of Royal Caribbean’s ships. In my trie I entered them in the order they are in the text file, from oldest to youngest ship. When the trie executes them out, they come out in alphabetical order.

In my data structure, CruiseTree, I printed the inventory, added cruises, found cruises and deleted cruises. To be able to print the inventory, I had to iterate the tree first, allowing it to read the tree from left to right. I had a problem with the addCruise function. One of the problems I had was because I did not declare the types. To be able to find a cruise, I also created a search function, which allows the findCruise function to read through the tree and find what is asked by the user. In my deleteCruise function, I also had to implement another delete function, postOrderDelete. This also allows the deleteCruise function to traverse through the tree.

When the user runs RoyalCaribbeanTree.cpp, the file will print out the cruises they have. The user will then look at the data, and decide what cruises they would like to add! They will then use the Add a Cruise selection to enter in all the information of the cruise they like, they can and are encouraged to add more than one. This is what their preference should look like when they add a cruise, “2004 Jewel 2502 Europe 7 1059”. Once they have added their preferred cruises, they can then print out their inventory they just selected. The user can then find a cruise, typing in all the data of the cruise as shown above, and it will print out all the information about the cruise. The user can also delete a cruise as well when entering all the cruises information, if they are trying to narrow down a vacation.

Overall, going back over these two data structures, I learned a lot on my own. Constructing my own project and what I wanted it to look like do and something I am interested really made it fun and engaging. It will be nice to also give me more ideas for projects in the future and over break where I can practice and work on my own.