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CS 141

1. **Requirements** What did this project ask you to do? What was the input? How was the input processed? What was the output?

The purpose of this project was to implement my own version of the TreeMap class. Using the MyMap interface, I could either create a BinarySearchTree or a SplayTree. I implemented a BST in my project. The tree operations were provided as pseudocode and my task was to write the code. To test out my TreeMap class I used my project 1 diver file and a sample driver file. My project 1 driver file received the input from command line arguments. The sample driver file has hard coded inputs to test out each of the methods in the class. The output came out as expected because the output with MyTreeMap in project 1 driver produced the same results as using the default TreeMap class. The sample driver file has print statements through to see if the commands are being executed and a print out of the size and keys confirmed the final results.

1. **Method** Describe the algorithm and data structures you used.

The algorithms used in this project are based on the algorithm on Wikipedia and the pseudocode provided with the project. The algorithms consisted of initially checking whether the tree is empty and if so, either create a new tree or return null.

1. **Implementation** Describe the structure of your code and the packages used.

The structure of the program is based on the shell provided. All of the methods and parameters follow the shell. The packages used in this project are tree.BinaryTree and the java.util.\* packages. Specifically, java.util.Sets<> and java.util.TreeSets<> are used to manage the keys.

1. **Testing** How did you make sure your implementation is correct?

I created a driver method with the basic commands as put, remove, size, and containsKey. When I run the driver file, I received numerous NullPointerExceptions and that is where I focused on. Eventually after I fixed all of the bugs, I used the sample driver file provided with the project. When the results from the sample driver came out as expected, I tested it with my project 1 driver file. The output with MyTreeMap and the default TreeMap came back exactly the same.

1. Findings What did you learn from this project? Graphs and analysis that might be required for this section.

I learned to import a package from a .class file in this project. I thought we had to write our own BinaryTree java file, and I wrote it. But one of my classmates told me that I could import the package into my program. I also learned algorithm to remove a node or to add a node to a TreeMap.