

C212 Practice Problems

Fall 2021

1. Create a private class implementing the ActionListener interface that displays the value of a counter variable. The counter variable is defined in an enclosing public class that displays a panel with a button to which the ActionListener is tied (Example from the lecture).
2. Write a method that iterate through an array using a for loop and catch any `ArrayIndexOutOfBoundsException` without breaking the loop.
3. Write a Java program to join two linked lists using the Collections framework.
4. Write a Java program to shuffle the elements in a linked list using the Collections framework.
5. Write a Java program to sort keys in Tree Map by using comparator using the Collections framework.
6. We have triangle made of blocks. The topmost row has 1 block, the next row down has 2 blocks, the next row has 3 blocks, and so on. Compute recursively (no loops or multiplication) the total number of blocks in such a triangle with the given number of rows.
 `triangle(0) → 0`
 `triangle(1) → 1`
 `triangle(2) → 3`
7. Given base and n that are both 1 or more, compute recursively (no loops) the value of base to the n power, so `powerN(3, 2)` is 9 (3 squared)
 `powerN(3, 1) → 3`
 `powerN(3, 2) → 9`
 `powerN(3, 3) → 27`
8. Give a map of key, values pairs modify and return the map as follows: if the key "a" has a value, set the key "b" to have that same value. In all cases remove the key "c", leaving the rest of the map unchanged.
 `mapShare({"a": "aaa", "b": "bbb", "c": "ccc"}) → {"a": "aaa", "b": "aaa"}`
 `mapShare({"b": "xyz", "c": "ccc"}) → {"b": "xyz"}`
 `mapShare({"a": "aaa", "c": "meh", "d": "hi"}) → {"a": "aaa", "b": "aaa", "d": "hi"}`
9. Given a map of food keys and their topping values, modify and return the map as follows: if the key "ice cream" has a value, set that as the value for the key "yogurt" also. If the key "spinach" has a value, change that value to "nuts".
 `topping2({"ice cream": "cherry"}) → {"yogurt": "cherry", "ice cream": "cherry"}`
 `topping2({"spinach": "dirt", "ice cream": "cherry"}) → {"yogurt": "cherry", "spinach": "nuts", "ice cream": "cherry"}`
 `topping2({"yogurt": "salt"}) → {"yogurt": "salt"}`

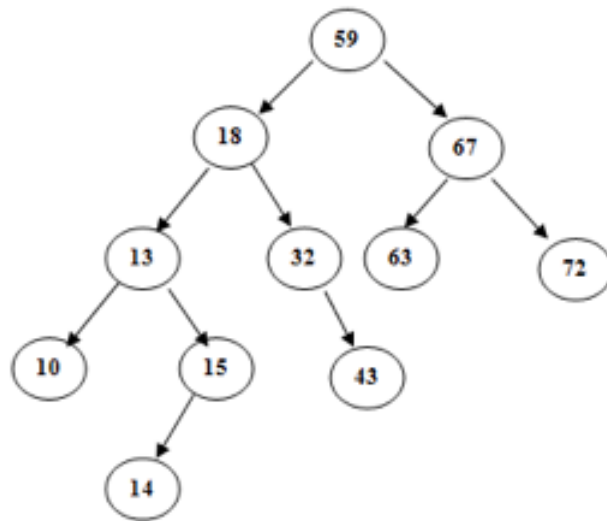


Figure 1: Binary Search Tree

10. Perform a preorder, postorder, inorder and breadth first traversal of the BST given in Figure 1
11. Add a node with value 30 in binary search tree in given in Figure 1
12. Perform insertion and selection sort on the following list of numbers. Show all the intermediate steps

23, 40, 4, 6, 20, 12