**Lecture 10 Binary Search Tree Worksheet**

1. Answer below questions.
   1. pointTest

**public static void** pointTest() { Point x = **new** Point(2, 3);

System.***out***.println(**"x = "** + x); *//1. X = 2, 3*

*change*(x);

System.***out***.println(**"now x = "** + x); *//4. X = 12, 13*

}

**public static void** change(Point p) { p.translate(10, 10);

System.***out***.println(**"p = "** + p); *//2. P = 12, 13*

p = **new** Point(-5, -5);

System.***out***.println(**"now p = "** + p); *//3. P = -5, -5*

}

* 1. arrayListTest

**public static void** arrayTest(){ java.util.List<String> list = **new** ArrayList<>(); list.add(**"hello"**);

list.add(**"world"**);

list.add(**"mikie"**);

Set<java.util.List<String>> listSet = **new** HashSet<>(); listSet.add(**new** ArrayList<>(list)); list.remove(**"world"**);

System.***out***.println(listSet);

*//True, listSet contains a list which contains world, but doesn’t contain world alone*

}

1. Binary Search Tree is a binary tree that holds below property for all root nodes in the tree

root data n

left data

less than n

right data

greater than n

\*\* If you allow duplicates , then you need to define where it goes. In this lecture, we will make it go left.

\*\* Practice building a binary search tree given data

1. Doing in-order traversal on the binary search tree results in a sorted list. In fact this is how Java internally manages TreeSet and TreeMap.
2. **[Think-Pair-Share]** You are to implement add method for building Binary Search Tree. Think through below questions and discuss with your partner!
   1. What should helper method do? (Yes it should do recursion. So what recursion to do what?)

It will add the data it is given to a new BST and return that BST.

* 1. What information does the helper method need? (What are the parameters that the helper method need?)

The current root and the data to add.

* 1. What is the base case of the recursion?

When the root is null.

* 1. What is the non-base case of the recursion?

When the root is not null.

* 1. Should the helper method return anything? Why or why not? If it should what should it return?

It should return the new root BST with the new data.