CS2300 Assignment 4 (50 points)

Due Date: 11/4 (11:59pm)

Description: In this assignment, you are going to write a Java program to implement a binary tree.

Requirement: For the basic binary tree operations, you need to implement

- Insert
- Delete

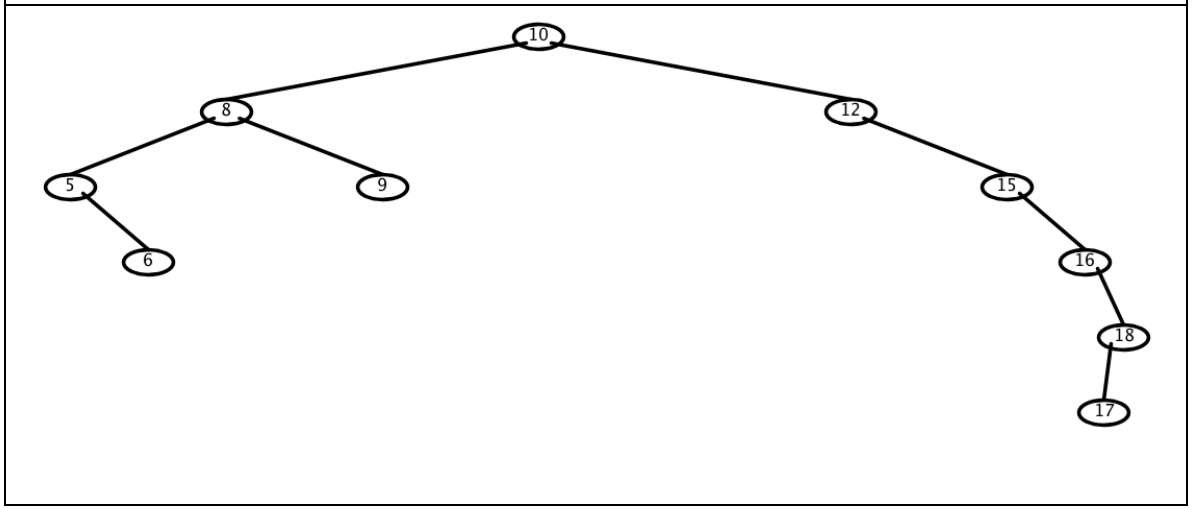
In addition, you need to implement two additional functions

- Compute the tree height
- Rebalance the binary tree

** One particular attention that you need to pay is to compare the key between nodes because we are extending Comparable. To compare two keys (key1 and key2), key1.compareTo(key2) where both key1 and key2 are generic type <T>.

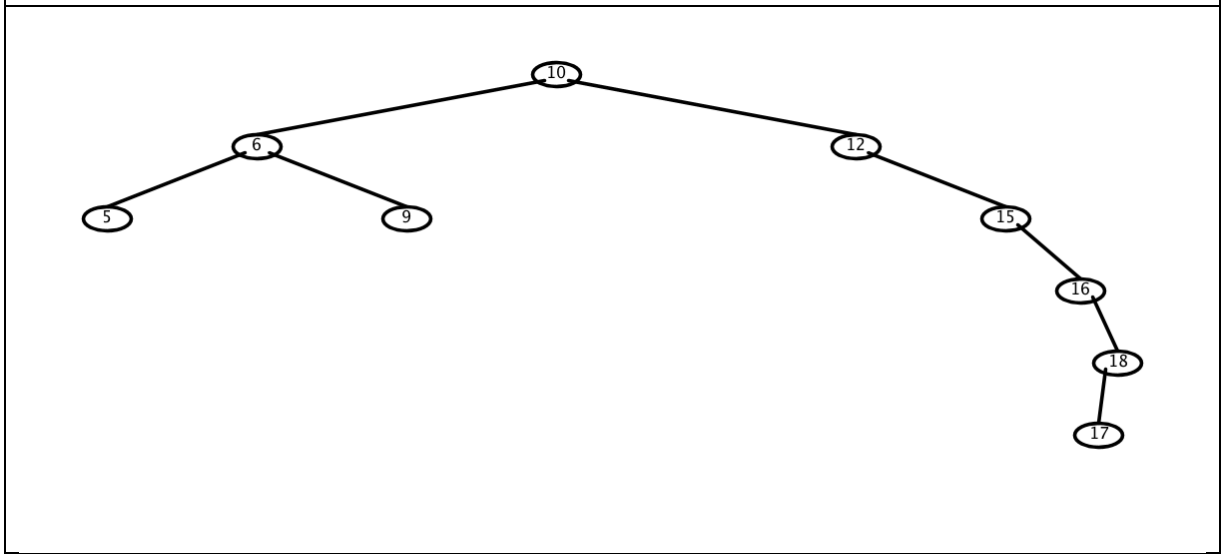
Expected Results may look like the following
After insertion

```
The height of the tree is 5
10
8
5
6
9
12
15
16
18
17
```



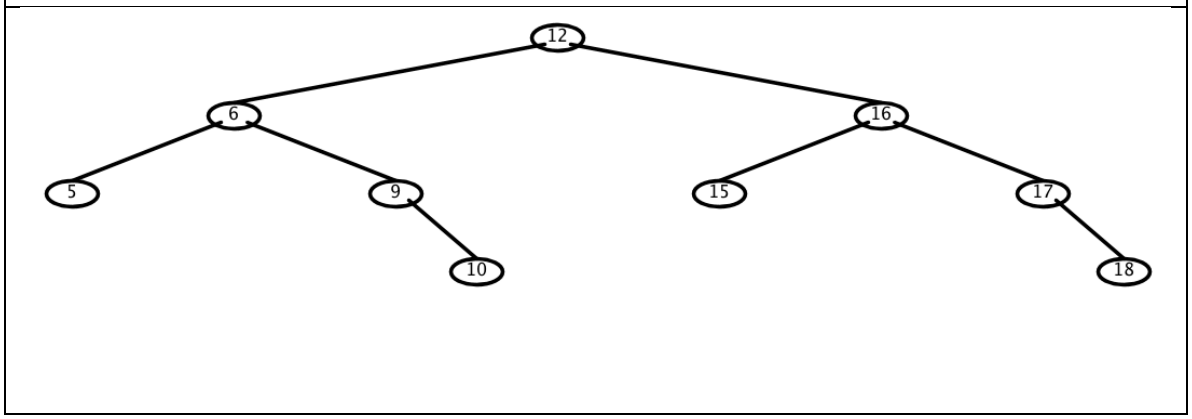
After deletion

```
The height of the tree is 5
10
6
5
9
12
15
16
18
17
```



After tree rebalancing

```
The height of the tree is 3
12
6
5
9
10
16
15
17
18
```



To compile,
>> javac BinaryTree.java DrawBinaryTree.java

To run,
>> java BinaryTree

Grading:

Submit your source files along with a readme indicating how to compile your files via blackboard.

Successfully compile and link (10 points)
Correctly implement the insertion and deletion (10 points)
Correctly identify the tree height (10 points)
Correctly rebalance the tree (20 points)

**** You may not use java.util.TreeMap or java.util.TreeSet ****