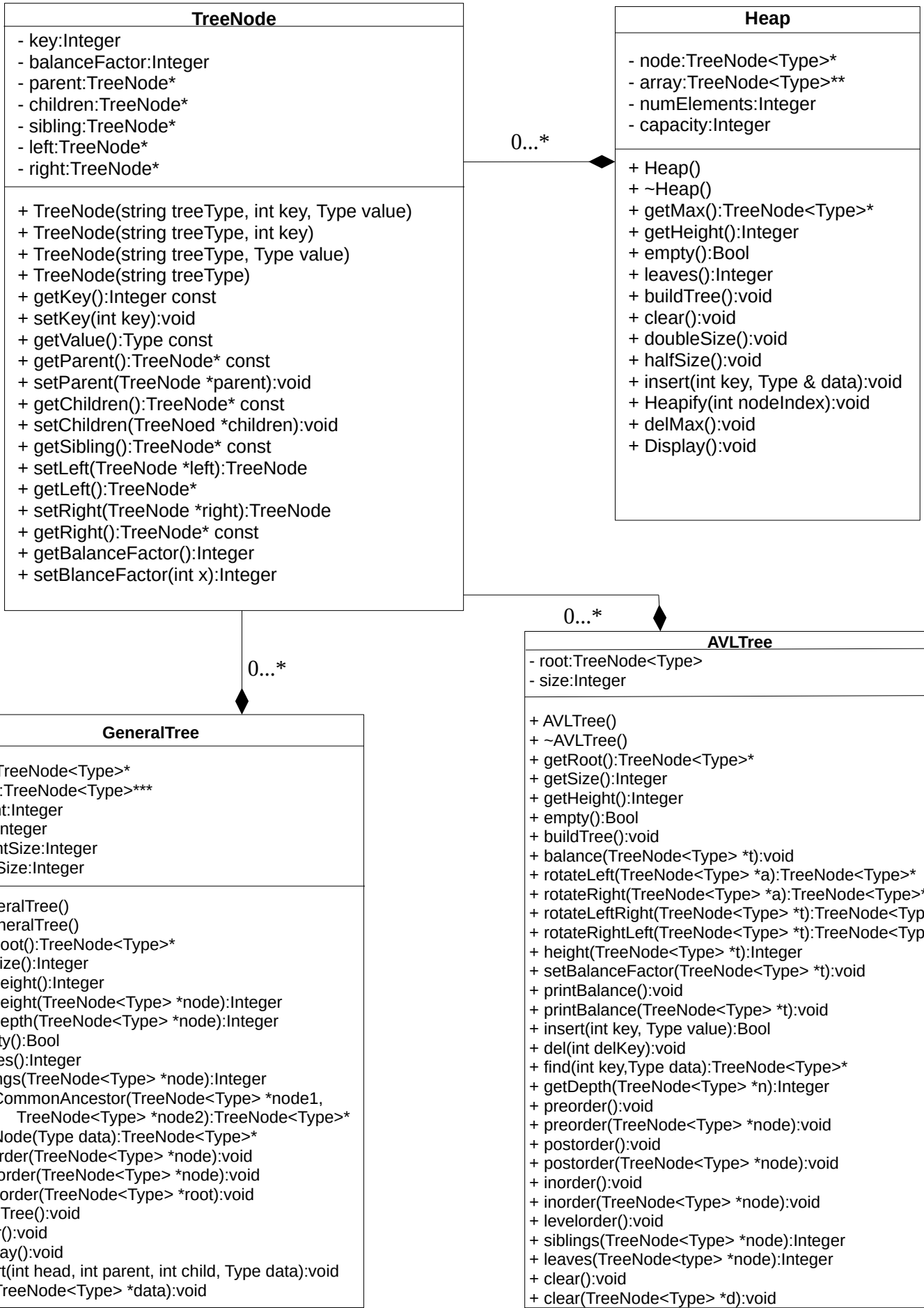
Project 3 Report

TreeNode



HEAP

Heap
- node:TreeNode<Type>* - array:TreeNode<Type>** - numElements:Integer - capacity:Integer
+ Heap() + ~Heap() + getMax():TreeNode<Type>* + getHeight():Integer + empty():Bool + leaves():Integer + buildTree():void + clear():void + doubleSize():void + halfSize():void + insert(int key, Type & data):void + Heapify(int nodeIndex):void + delMax():void + Display():void

Efficiency of getMax(): O(1)

Efficiency of getHeight(): O(1)

Efficiency of empty(): O(1)

Efficiency of getSize(): O(1)

Efficiency of leaves(): O(n)

Efficiency of buildTree(): O(n)

Efficiency of clear(): O(n)

Efficiency of doubleSize(): O(2n + n)

Efficiency of halfSize(): O(n + n/4)

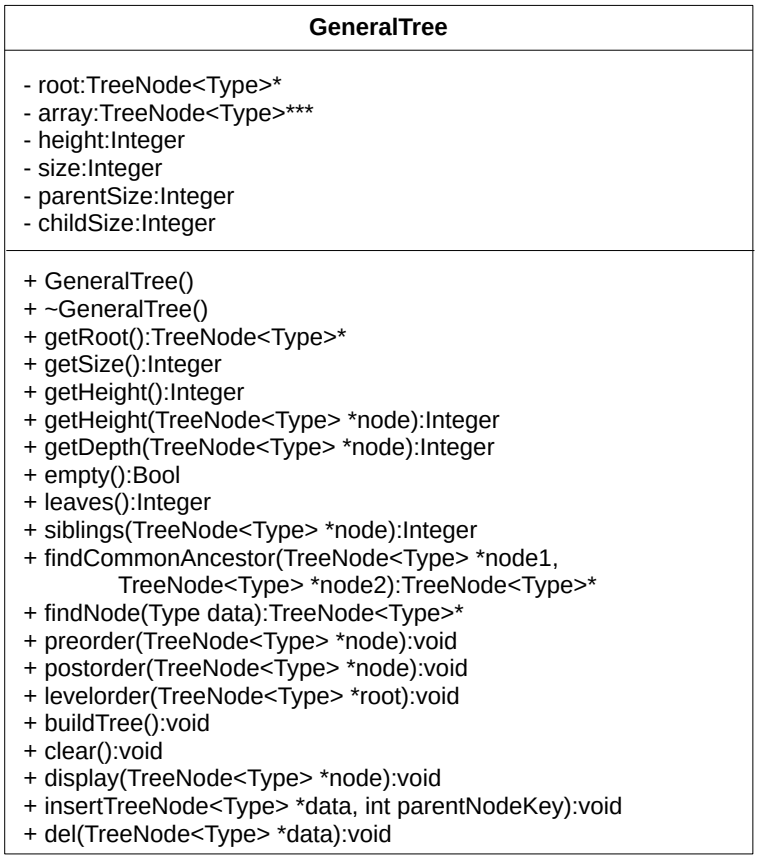
Efficiency of insert(): O(nlogn (on average))

Efficiency of Heapify(): O(logn)

Efficiency of del(): O(nlogn)

Efficiency of Display(): O(n)

General Tree



Efficiency of getRoot: O(1)

Efficiency of getSize(): O(1)

Efficiency of getHeight(): O(1)

Efficiency of empty(): O(1)

Efficiency of buildTree(): O(n)

Efficiency of insert(): O(logn)

Efficiency of del(): O(logn)

Efficiency of findCommonAncestor():

Efficiency of findNode(): O(logn)

Efficiency of getDepth(): O(logn)

Efficiency of preorder(): O(n)

Efficiency of postorder(): O(n)

Efficiency of levelorder(): O(n)

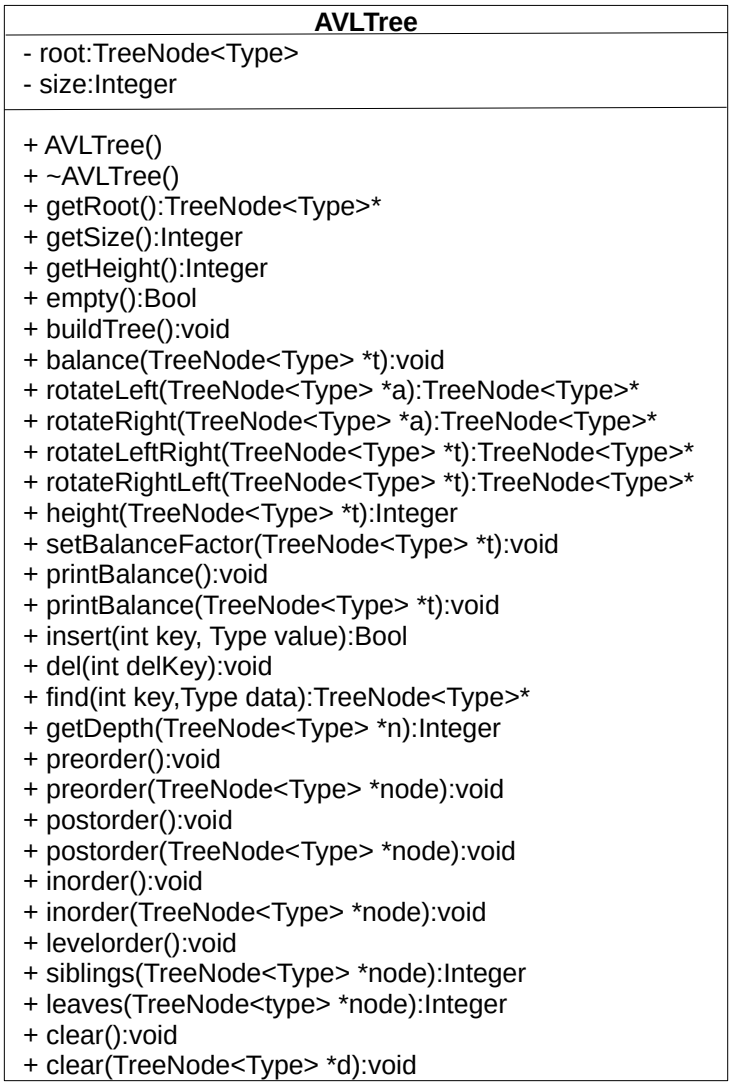
Efficiency of siblings(): O(1)

Efficiency of leaves(): O(n)

Efficiency of clear(): O(n)

Efficiency of display():O(n)

AVL Tree



Efficiency of getRoot: O(1)

Efficiency of getSize(): O(1)

Efficiency of getHeight(): O(1)

Efficiency of empty(): O(1)

Efficiency of buildTree(): O(n)

Efficiency of balance(): O(logn)

Efficiency of height(): O(logn)

Efficiency of setBalance(): O(1)

Efficiency of printBalance(): O(1)

Efficiency of insert(): O(logn)

Efficiency of del(): O(logn)

Efficiency of find(): O(logn)

Efficiency of getDepth(): O(logn)

Efficiency of preorder(): O(n)

Efficiency of postorder(): O(n)

Efficiency of inorder(): O(n)

Efficiency of levelorder(): O(n)

Efficiency of siblings(): O(1)

Efficiency of leaves(): O(n)

Efficiency of clear(): O(1)

Efficiency of rotateLeft(): O(logn)

Efficiency of rotateRight(): O(logn)

Efficiency of rotateLeftRight(): O(logn)

Efficiency of rotateRightLeft(): O(logn)