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searchTree

## Interface Tree<K extends java.lang.Comparable<K>,V>

* All Known Implementing Classes: [EmptyTree](http://docs.google.com/searchTree/EmptyTree.html), [NonEmptyTree](http://docs.google.com/searchTree/NonEmptyTree.html)  
    
  public interface Tree<K extends java.lang.Comparable<K>,V>  
  This interface describes the interface for both empty and non-empty search trees.

### Method SummaryAll Methods Instance Methods Abstract Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + void | * + [addKeysToCollection](http://docs.google.com/searchTree/Tree.html#addKeysToCollection-java.util.Collection-)(java.util.Collection<[K](http://docs.google.com/searchTree/Tree.html)> c) Add all keys bound in this tree to the collection c. |
| * + [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/Tree.html),[V](http://docs.google.com/searchTree/Tree.html)> | * + [delete](http://docs.google.com/searchTree/Tree.html#delete-K-)([K](http://docs.google.com/searchTree/Tree.html) key) Delete any binding the key has in this tree. |
| * + [NonEmptyTree](http://docs.google.com/searchTree/NonEmptyTree.html)<[K](http://docs.google.com/searchTree/Tree.html),[V](http://docs.google.com/searchTree/Tree.html)> | * + [insert](http://docs.google.com/searchTree/Tree.html#insert-K-V-)([K](http://docs.google.com/searchTree/Tree.html) key, [V](http://docs.google.com/searchTree/Tree.html) value) Insert/update the Tree with a new key:value pair. |
| * + [K](http://docs.google.com/searchTree/Tree.html) | * + [max](http://docs.google.com/searchTree/Tree.html#max--)() Return the maximum key in the subtree |
| * + [K](http://docs.google.com/searchTree/Tree.html) | * + [min](http://docs.google.com/searchTree/Tree.html#min--)() Return the minimum key in the subtree |
| * + [V](http://docs.google.com/searchTree/Tree.html) | * + [search](http://docs.google.com/searchTree/Tree.html#search-K-)([K](http://docs.google.com/searchTree/Tree.html) key) Find the value that this key is bound to in this tree. |
| * + int | * + [size](http://docs.google.com/searchTree/Tree.html#size--)() Return number of keys that are bound in this tree. |
| * + [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/Tree.html),[V](http://docs.google.com/searchTree/Tree.html)> | * + [subTree](http://docs.google.com/searchTree/Tree.html#subTree-K-K-)([K](http://docs.google.com/searchTree/Tree.html) fromKey, [K](http://docs.google.com/searchTree/Tree.html) toKey) Returns a Tree containing all entries between fromKey and toKey, inclusive |

### Method Detail

#### search [V](http://docs.google.com/searchTree/Tree.html) search([K](http://docs.google.com/searchTree/Tree.html) key) Find the value that this key is bound to in this tree.Parameters: key - -- Key to search for Returns: -- value associated with the key by this Tree, or null if the key does not have an association in this tree.

#### insert [NonEmptyTree](http://docs.google.com/searchTree/NonEmptyTree.html)<[K](http://docs.google.com/searchTree/Tree.html),[V](http://docs.google.com/searchTree/Tree.html)> insert([K](http://docs.google.com/searchTree/Tree.html) key, [V](http://docs.google.com/searchTree/Tree.html) value) Insert/update the Tree with a new key:value pair. If the key already exists in the tree, update the value associated with it. If the key doesn't exist, insert the new key value pair. This method returns a reference to an Tree that represents the updated value. In many, but not all cases, the method may just return a reference to this. This method is annotated @CheckReturnValue because you have to pay attention to the return value; if you simply invoke insert on a Tree and ignore the return value, your code is almost certainly wrong.Parameters: key - -- Key value - -- Value that the key maps to Returns: -- updated tree

#### delete [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/Tree.html),[V](http://docs.google.com/searchTree/Tree.html)> delete([K](http://docs.google.com/searchTree/Tree.html) key) Delete any binding the key has in this tree. If the key isn't bound, this is a no-op This method returns a reference to an Tree that represents the updated value. In many, but not all cases, the method may just return a reference to this. This method is annotated @CheckReturnValue because you have to pay attention to the return value; if you simply invoke delete on a Tree and ignore the return value, your code is almost certainly wrong.Parameters: key - -- Key Returns: -- updated tree

#### max [K](http://docs.google.com/searchTree/Tree.html) max() throws searchTree.TreeIsEmptyException Return the maximum key in the subtreeReturns: maximum key Throws: TreeIsEmptyException - if the tree is empty

#### min [K](http://docs.google.com/searchTree/Tree.html) min() throws searchTree.TreeIsEmptyException Return the minimum key in the subtreeReturns: minimum key Throws: TreeIsEmptyException - if the tree is empty

#### size int size() Return number of keys that are bound in this tree.Returns: number of keys that are bound in this tree.

#### addKeysToCollection void addKeysToCollection(java.util.Collection<[K](http://docs.google.com/searchTree/Tree.html)> c) Add all keys bound in this tree to the collection c. The elements must be added in their sorted order.Parameters: c - - A list that acts as an accumulator for keys. Keys are inserted in the list in increasing order. You may not use any sorting method or Collections.sort to keep the list sorted.

#### subTree [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/Tree.html),[V](http://docs.google.com/searchTree/Tree.html)> subTree([K](http://docs.google.com/searchTree/Tree.html) fromKey, [K](http://docs.google.com/searchTree/Tree.html) toKey) Returns a Tree containing all entries between fromKey and toKey, inclusiveParameters: fromKey - - Lower bound value for keys in subtree toKey - - Upper bound value for keys in subtree Returns: Tree containing all entries between fromKey and toKey, inclusive

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