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searchTree

## Class NonEmptyTree<K extends java.lang.Comparable<K>,V>

* java.lang.Object
  + searchTree.NonEmptyTree<K,V>
* All Implemented Interfaces: [Tree](http://docs.google.com/searchTree/Tree.html)<K,V>  
    
  public class NonEmptyTree<K extends java.lang.Comparable<K>,V>  
  extends java.lang.Object  
  implements [Tree](http://docs.google.com/searchTree/Tree.html)<K,V>
* This class represents a non-empty search tree. An instance of this class should contain:
  + A key
  + A value (that the key maps to)
  + A reference to a left Tree that contains key:value pairs such that the keys in the left Tree are less than the key stored in this tree node.
  + A reference to a right Tree that contains key:value pairs such that the keys in the right Tree are greater than the key stored in this tree node.

### Constructor SummaryConstructors

|  |
| --- |
| * + Constructor and Description |
| * + [NonEmptyTree](http://docs.google.com/searchTree/NonEmptyTree.html#NonEmptyTree-K-V-searchTree.Tree-searchTree.Tree-)([K](http://docs.google.com/searchTree/NonEmptyTree.html) key, [V](http://docs.google.com/searchTree/NonEmptyTree.html) value, [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> left, [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> right) |

### Method SummaryAll Methods Instance Methods Concrete Methods

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

### Methods inherited from class java.lang.Objectequals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

### Constructor Detail

#### NonEmptyTree public NonEmptyTree([K](http://docs.google.com/searchTree/NonEmptyTree.html) key, [V](http://docs.google.com/searchTree/NonEmptyTree.html) value, [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> left, [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> right)

### Method Detail

#### search public [V](http://docs.google.com/searchTree/NonEmptyTree.html) search([K](http://docs.google.com/searchTree/NonEmptyTree.html) key) Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#search-K-) Find the value that this key is bound to in this tree.Specified by: [search](http://docs.google.com/searchTree/Tree.html#search-K-) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> 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 public [NonEmptyTree](http://docs.google.com/searchTree/NonEmptyTree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> insert([K](http://docs.google.com/searchTree/NonEmptyTree.html) key, [V](http://docs.google.com/searchTree/NonEmptyTree.html) value) Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#insert-K-V-) 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.Specified by: [insert](http://docs.google.com/searchTree/Tree.html#insert-K-V-) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> Parameters: key - -- Key value - -- Value that the key maps to Returns: -- updated tree

#### delete public [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> delete([K](http://docs.google.com/searchTree/NonEmptyTree.html) key) Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#delete-K-) 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.Specified by: [delete](http://docs.google.com/searchTree/Tree.html#delete-K-) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> Parameters: key - -- Key Returns: -- updated tree

#### max public [K](http://docs.google.com/searchTree/NonEmptyTree.html) max() Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#max--) Return the maximum key in the subtreeSpecified by: [max](http://docs.google.com/searchTree/Tree.html#max--) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> Returns: maximum key

#### min public [K](http://docs.google.com/searchTree/NonEmptyTree.html) min() Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#min--) Return the minimum key in the subtreeSpecified by: [min](http://docs.google.com/searchTree/Tree.html#min--) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> Returns: minimum key

#### size public int size() Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#size--) Return number of keys that are bound in this tree.Specified by: [size](http://docs.google.com/searchTree/Tree.html#size--) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> Returns: number of keys that are bound in this tree.

#### addKeysToCollection public void addKeysToCollection(java.util.Collection<[K](http://docs.google.com/searchTree/NonEmptyTree.html)> c) Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#addKeysToCollection-java.util.Collection-) Add all keys bound in this tree to the collection c. The elements must be added in their sorted order.Specified by: [addKeysToCollection](http://docs.google.com/searchTree/Tree.html#addKeysToCollection-java.util.Collection-) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> 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 public [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html),[V](http://docs.google.com/searchTree/NonEmptyTree.html)> subTree([K](http://docs.google.com/searchTree/NonEmptyTree.html) fromKey, [K](http://docs.google.com/searchTree/NonEmptyTree.html) toKey) Description copied from interface: [Tree](http://docs.google.com/searchTree/Tree.html#subTree-K-K-) Returns a Tree containing all entries between fromKey and toKey, inclusiveSpecified by: [subTree](http://docs.google.com/searchTree/Tree.html#subTree-K-K-) in interface [Tree](http://docs.google.com/searchTree/Tree.html)<[K](http://docs.google.com/searchTree/NonEmptyTree.html) extends java.lang.Comparable<[K](http://docs.google.com/searchTree/NonEmptyTree.html)>,[V](http://docs.google.com/searchTree/NonEmptyTree.html)> Parameters: 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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* [Index](http://docs.google.com/index-files/index-1.html)
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