Project 7

Generated by Doxygen 1.8.12

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Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 4

Class Documentation

4.1 BinaryNode< ItemType > Class Template Reference

Public Member Functions

- void setItem (const ItemType &anItem)
- ItemType getItem () const
- bool isLeaf () const
- BinaryNode< ItemType > * **getParentPtr** () const
- BinaryNode< ItemType > * **getLeftChildPtr** () const
- BinaryNode< ItemType > * **getRightChildPtr** () const
- void **setParentPtr** (BinaryNode< ItemType > *parentPtr)
- void **setLeftChildPtr** (BinaryNode< ItemType > *leftPtr)
- void **setRightChildPtr** (BinaryNode< ItemType > *rightPtr)

Public Attributes

- color_t **color**

4.1.1 Member Function Documentation

4.1.1.1 getItem()

```
template<class ItemType >
ItemType BinaryNode< ItemType >::getItem ( ) const
```

Returns the item data member

Returns

The item data member.

4.1.1.2 isLeaf()

```
template<class ItemType >
bool BinaryNode< ItemType >::isLeaf ( ) const
```

Tells if the node is a leaf

Returns

Whether or not the node is a leaf of the tree.

4.1.1.3 setItem()

```
template<class ItemType >
void BinaryNode< ItemType >::setItem (
            const ItemType & anItem )
```

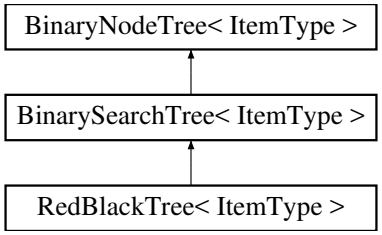
Sets the item data member

The documentation for this class was generated from the following files:

- BinaryNode.h
- BinaryNode.cpp

4.2 BinaryNodeTree< ItemType > Class Template Reference

Inheritance diagram for BinaryNodeTree< ItemType >:



Public Member Functions

- bool **isEmpty** () const
- int **getHeight** () const
- int **getNumberOfNodes** () const
- ItemType **getRootData** () const
- void **setRootData** (const ItemType &newData)
- bool **add** (const ItemType &newData)
- bool **remove** (const ItemType &data)
- void **clear** ()
- ItemType **getEntry** (const ItemType &anEntry) const
- bool **contains** (const ItemType &anEntry) const
- void **preorderTraverse** (void visit(ItemType &)) const
- void **inorderTraverse** (void visit(ItemType &)) const
- void **postorderTraverse** (void visit(ItemType &)) const
- BinaryNodeTree & **operator=** (const BinaryNodeTree &rhs)

Protected Member Functions

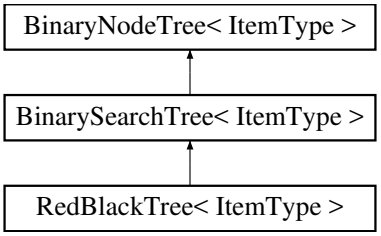
- int **getHeightHelper** (BinaryNode< ItemType > *subTreePtr) const
- int **getNumberOfNodesHelper** (BinaryNode< ItemType > *subTreePtr) const
- BinaryNode< ItemType > * **balancedAdd** (BinaryNode< ItemType > *subTreePtr, BinaryNode< ItemType > *newNodePtr)
- BinaryNode< ItemType > * **removeValue** (BinaryNode< ItemType > *subTreePtr, const ItemType target, bool &isSuccessful)
- BinaryNode< ItemType > * **moveValuesUpTree** (BinaryNode< ItemType > *subTreePtr)
- BinaryNode< ItemType > * **findNode** (BinaryNode< ItemType > *treePtr, const ItemType &target, bool &isSuccessful) const
- BinaryNode< ItemType > * **copyTree** (BinaryNode< ItemType > *oldTreePtr) const
- void **destroyTree** (BinaryNode< ItemType > *subTreePtr)
- void **preorder** (void visit(ItemType &), BinaryNode< ItemType > *treePtr) const
- void **inorder** (ItemType &, BinaryNode< ItemType > *treePtr) const
- void **postorder** (void visit(ItemType &), BinaryNode< ItemType > *treePtr) const

The documentation for this class was generated from the following files:

- BinaryNodeTree.h
- BinaryNodeTree.cpp

4.3 BinarySearchTree< ItemType > Class Template Reference

Inheritance diagram for BinarySearchTree< ItemType >:



Public Member Functions

- bool **isEmpty** () const
- int **getHeight** () const
- int **getNumberOfNodes** () const
- ItemType **getRootData** () const
- void **setRootData** (ItemType &newEntry)
- bool **add** (const ItemType &newData)
- bool **remove** (const ItemType &target)
- void **clear** ()
- ItemType **getEntry** (const ItemType &anEntry) const
- void **preorderTrav** (void visit(ItemType &)) const
- void **inorderTrav** (void visit(ItemType &)) const
- void **postorderTrav** (void visit(ItemType &)) const

Protected Member Functions

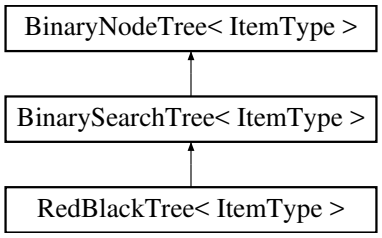
- BinaryNode< ItemType > * **placeNode** (BinaryNode< ItemType > *subTreePtr, BinaryNode< ItemType > *newNodePtr)
- BinaryNode< ItemType > * **removeValue** (BinaryNode< ItemType > *subTreePtr, const ItemType &target, bool &isSuccessful)
- BinaryNode< ItemType > * **removeNode** (BinaryNode< ItemType > *nodeToRemovePtr)
- BinaryNode< ItemType > * **removeLeftmostNode** (BinaryNode< ItemType > *nodePtr, ItemType &inorderSuccessor)
- BinaryNode< ItemType > * **findNode** (BinaryNode< ItemType > *treePtr, const ItemType &target) const
- void **clearTree** (BinaryNode< ItemType > *subTreePtr)

The documentation for this class was generated from the following files:

- BinarySearchTree.h
- BinarySearchTree.cpp

4.4 RedBlackTree< ItemType > Class Template Reference

Inheritance diagram for RedBlackTree< ItemType >:



Public Member Functions

- bool **isEmpty** () const
- int **getHeight** () const
- int **getNumberOfNodes** () const
- ItemType **getRootData** () const
- void **setRootData** (ItemType &newEntry)
- bool **add** (const ItemType &newData)
- bool **remove** (const ItemType &target)
- void **clear** ()
- ItemType **getEntry** (const ItemType &anEntry) const
- void **preorderTrav** (void visit(ItemType &)) const
- void **inorderTrav** (ItemType &) const
- void **postorderTrav** (void visit(ItemType &)) const

Additional Inherited Members

The documentation for this class was generated from the following files:

- RedBlackTree.h
- RedBlackTree.cpp

Chapter 5

File Documentation

5.1 BinaryNode.cpp File Reference

Implementation file for the Binary Node class.

5.1.1 Detailed Description

Implementation file for the Binary Node class.

Author

Willis Allstead

Version

0.5

5.2 BinaryNode.h File Reference

Header file for the Binary Node class.

```
#include "BinaryNode.cpp"
```

Classes

- class BinaryNode< ItemType >

Enumerations

- enum **color_t** { **black**, **red** }

5.2.1 Detailed Description

Header file for the Binary Node class.

Author

Willis Allstead

Specifies the members of the BinaryNode class

Version

0.5

5.3 BinaryNodeTree.cpp File Reference

Implementation file for the Binary Node Tree class.

5.3.1 Detailed Description

Implementation file for the Binary Node Tree class.

Author

Willis Allstead

Version

0.5

5.4 BinaryNodeTree.h File Reference

Header file for the Binary Node Tree class.

```
#include <algorithm>
#include "BinaryNode.h"
#include "BinaryNodeTree.cpp"
```

Classes

- class BinaryNodeTree< ItemType >

5.4.1 Detailed Description

Header file for the Binary Node Tree class.

Author

Willis Allstead

Specifies the members of the Binary Node Tree class

Version

0.5

5.5 BinarySearchTree.cpp File Reference

Implementation file for the Binary Search Tree class.

5.5.1 Detailed Description

Implementation file for the Binary Search Tree class.

Author

Willis Allstead

Version

0.5

5.6 BinarySearchTree.h File Reference

Header file for the Binary Search Tree class.

```
#include "BinaryNode.h"
#include "BinaryNodeTree.h"
#include "BinarySearchTree.cpp"
```

Classes

- class BinarySearchTree< ItemType >

5.6.1 Detailed Description

Header file for the Binary Search Tree class.

Author

Willis Allstead

Specifies the members of the Binary Search Tree class

Version

0.5

5.7 PA07.cpp File Reference

Main driver for project 7.

```
#include <iostream>
#include "RedBlackTree.h"
```

Functions

- bool **existsInArray** (int toCheck, int arr[ ], int count)
- int **main** ()

Variables

- const int **numValues** = 1000

5.7.1 Detailed Description

Main driver for project 7.

Author

Willis Allstead

Version

1.0

5.8 RedBlackTree.cpp File Reference

Implementation file for the Red Black Tree class.

5.8.1 Detailed Description

Implementation file for the Red Black Tree class.

Author

Willis Allstead

Version

0.5

5.9 RedBlackTree.h File Reference

Header file for the Red Black Tree class.

```
#include "BinaryNode.h"
#include "BinarySearchTree.h"
#include "RedBlackTree.cpp"
```

Classes

- class RedBlackTree< ItemType >

5.9.1 Detailed Description

Header file for the Red Black Tree class.

Author

Willis Allstead

Specifies the members of the Red Black Tree class

Version

0.5

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