Reference Manual

Generated by Doxygen 1.8.6

Sat Mar 25 2017 08:55:24

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Chapter 1

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

Class Documentation

3.1 List< typename > Class Template Reference

`#include <list.h>`

Public Member Functions

- List ()
- List (const List< T > &) throw (bad_alloc)
- ~List ()
- void add (unsigned, const T &) throw (bad_alloc, out_of_range)
- void addAll (const List< T > &) throw (bad_alloc)
- void addAll (unsigned, const List< T > &) throw (bad_alloc, out_of_range)
- void addFirst (const T &) throw (bad_alloc)
- void addLast (const T &) throw (bad_alloc)
- void clear ()
- bool contains (const T &) const
- bool empty () const
- int indexOf (const T &) const
- T & get (unsigned) const throw (out_of_range)
- T & getFirst () const throw (NoSuchObject)
- T & getLast () const throw (NoSuchObject)
- ListIterator< T > listIterator ()
- ListIterator< T > listIterator (unsigned) throw (out_of_range)
- T remove (unsigned) throw (out_of_range)
- T removeFirst () throw (NoSuchObject)
- T removeFirstOccurrence (const T &) throw (NoSuchObject)
- T removeLast () throw (NoSuchObject)
- T removeLastOccurrence (const T &) throw (NoSuchObject)
- T set (unsigned, const T &) throw (out_of_range)
- unsigned size () const
- T * toArray () const throw (bad_alloc)
- const List< T > & operator= (const List< T > &) throw (bad_alloc)
- void printInternal (ostream &=cout)

Private Member Functions

- void add (Node< T > *, const T &) throw (bad_alloc)
- void initialize ()
- Node< T > * getIthNode (unsigned) const throw (out_of_range)
- T remove (Node< T > *)

Private Attributes

- Node< T > * **frontPtr**
- Node< T > * **backPtr**
- unsigned **sz**

Friends

- ostream & operator<< (ostream &, const List< T > &)

3.1.1 Detailed Description

template<typename>class List< typename >

Implementation of a List ADT using a doubly-linked list.

Author

Mark Maloof

Version

1.1, 3/23/10

3.1.2 Constructor & Destructor Documentation

3.1.2.1 template<typename T > List< T >::List ( )

Default constructor.

3.1.2.2 template<typename T > List< T >::List (const List< T > & *list*) throw bad_alloc)

Copy constructor.

Exceptions

bad_alloc	if memory cannot be allocated.

3.1.2.3 template<typename T > List< T >::~List ( )

Class destructor.

3.1.3 Member Function Documentation

3.1.3.1 template<typename T > void List< T >::add (unsigned *index*, const T & *object*) throw bad_alloc, out_of_range)

Adds the specified object to this list at the specified position.

Parameters

index	the position at which to insert the object
object	the object to be inserted

Exceptions

bad_alloc	if memory cannot be allocated
out_of_range	if the index is out of range

3.1.3.2 template<typename T > void List< T >::add (Node< T > * *current,* const T & *object*) throw bad_alloc) [private]

Adds the specified object to this list at the specified position.

Parameters

current	the position at which to insert the object
object	the object to be inserted

Exceptions

bad_alloc	if memory cannot be allocated

3.1.3.3 template<typename T > void List< T >::addAll (const List< T > & *list*) throw bad_alloc)

Adds all of objects in the specified list to the end of this list.

Parameters

list	containing the objects to be added

Exceptions

bad_alloc	if memory cannot be allocated

3.1.3.4 template<typename T > void List< T >::addAll (unsigned *index,* const List< T > & *list*) throw bad_alloc, out_of_range)

Adds all of objects in the specified list to the specified position of this list.

Parameters

index	the position at which to insert the object
list	containing the objects to be added

Exceptions

bad_alloc	if memory cannot be allocated
out_of_range	if the index is out of range

3.1.3.5 template<typename T > void List< T >::addFirst (const T & *object*) throw bad_alloc)

Adds the specified object to the front of the list.

Parameters

object	the object to be added to the front of the list

Exceptions

bad_alloc	if memory cannot be allocated

3.1.3.6 template<typename T > void List< T >::addLast (const T & *object*) throw bad_alloc)

Adds the specified object to the end of the list.

Parameters

object	the object to be added to the back of the list

Exceptions

bad_alloc	if memory cannot be allocated

3.1.3.7 template<typename T > void List< T >::clear ( )

Clears this list by removing all of its elements.

3.1.3.8 template<typename T > bool List< T >::contains (const T & *object*) const

Returns true if this list contains the specified object

Parameters

object	the specified object

Returns

true if the list contains the object; false otherwise

3.1.3.9 template<typename T > bool List< T >::empty ( ) const

Returns true if this list is empty; returns false otherwise.

Returns

true if empty; false otherwise

3.1.3.10 template<typename T > T & List< T >::get (unsigned *index*) const throw out_of_range)

Returns a reference to the object at the specified position in this list.

Parameters

index	the position of the object

Returns

a reference to the object at the specified position

Exceptions

out_of_range	if the index is out of range

3.1.3.11 template<typename T > T & List< T >::getFirst ( ) const throw NoSuchObject)

Returns a reference to the first object in this list.

Returns

a reference to the first object

Exceptions

NoSuchObject	if no such object exists in this list

3.1.3.12 template<typename T > Node< T > * List< T >::getIthNode (unsigned *index*) const throw out_of_range) [private]

Returns a pointer to the node at the specified position.

Parameters

index	the position of the object

Returns

a pointer to the node at the specified position

Exceptions

out_of_range	if the position is out of range

3.1.3.13 template<typename T > T & List< T >::getLast ( ) const throw NoSuchObject)

Returns a reference to the last object in this list.

Returns

a reference to the last object

Exceptions

NoSuchObject	if no such object exists in this list

3.1.3.14 template<typename T > int List< T >::indexOf (const T & *object*) const

Returns the position of the specified object in this list. Returns -1 if the object is not in this list.

Parameters

object	the object to be found in the list

Returns

the position of object in the list

3.1.3.15 template<typename T > void List< T >::initialize ( ) [private]

Sets the private data members of this list to their defaults values; that is, sets the points to null and size to zero.

3.1.3.16 template<typename T > ListIterator< T > List< T >::listIterator ( )

Returns a bidirectional iterator for this list.

Returns

3.1.3.17 template<typename T > ListIterator< T > List< T >::listIterator (unsigned *index*) throw out_of_range)

Returns a bidirectional iterator for this list that starts at the specified position.

Parameters

index	the starting position of the iterator

Returns

a bidirectional list iterator

Exceptions

out_of_range	if the index is out of range

3.1.3.18 template<typename T > const List< T > & List< T >::operator= (const List< T > & *list*) throw bad_alloc)

Returns a deep copy of the specified list.

Parameters

list	the list to be copied.

Returns

a copy of the list.

Exceptions

bad_alloc	if memory cannot be allocated.

3.1.3.19 template<typename T > void List< T >::printInternal (ostream & *out* = `cout`)

A utility method that prints the internal state of this list.

3.1.3.20 template<typename T > T List< T >::remove (unsigned *index*) throw out_of_range)

Removes and returns the object at the specified position.

Parameters

index	the position of the object

Returns

the object at the specified position

Exceptions

out_of_range	if the index is out of range

3.1.3.21 template<typename T > T List< T >::remove (Node< T > * *current*) `[private]`

Removes and returns the object to which current points.

Parameters

current	the position of the object

Returns

the object at the specified position

3.1.3.22 template<typename T > T List< T >::removeFirst ( ) throw NoSuchObject)

Removes and returns the first object in this list.

Returns

the object at the front of the list

Exceptions

NoSuchObject	if no such object exists in this list

3.1.3.23 template<typename T > T List< T >::removeFirstOccurrence (const T & *object*) throw NoSuchObject)

Removes and returns the first occurrence of the object in this list.

Parameters

object	the object in the list

Returns

the first occurence of object in this list

Exceptions

NoSuchObject	if no such object exists in this list

3.1.3.24 template<typename T > T List< T >::removeLast ( ) throw NoSuchObject)

Removes and returns the last object in this list.

Returns

the last object in this list

Exceptions

NoSuchObject	if no such object exists in this list

3.1.3.25 template<typename T > T List< T >::removeLastOccurrence (const T & *object*) throw NoSuchObject)

Removes and returns the last occurrence of the object in this list.

Parameters

object	the object in the list

Returns

the last occurence of object in this list

Exceptions

NoSuchObject	if no such object exists in this list

3.1.3.26 template<typename T > T List< T >::set (unsigned *index*, const T & *object*) throw out_of_range)

Sets the object at the specified position to the specified object and returns the replaced object.

Parameters

index	the position of the object
object	the object

Returns

the replaced object

Exceptions

out_of_range	if the index is out of range

3.1.3.27 template<typename T > unsigned List< T >::size ( ) const

Returns the size (i.e., number of objects) of this list.

Returns

an unsigned integer indicating this list's size

3.1.3.28 template<typename T > T * List< T >::toArray ( ) const throw bad_alloc)

Returns an array containing the objects of this list.

Returns

an array containing the objects of this list

Exceptions

bad_alloc	if memory cannot be allocated.

3.1.4 Friends And Related Function Documentation

3.1.4.1 template<typename > ostream& operator<< (ostream & *out,* const List< T > & *list*) [friend]

Overloaded stream insertion operator that outputs the specified list to the output stream in the format [e1,e2,e3,...], where e1, e2, ... are the elements of the list.

Parameters

out	the output stream
list	the specified list

Returns

the modified output stream

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

- iterator.h
- list.h

3.2 ListIterator< T > Class Template Reference

`#include <iterator.h>`

Public Member Functions

- ListIterator ()
- bool hasNext () const
- bool hasPrevious () const
- T & next () throw (NoSuchObject)
- T & previous () throw (NoSuchObject)
- void set (const T &)
- void printInternal () const

Private Attributes

- Node< T > * **current**
- bool **atFront**
- bool **atEnd**

Friends

- class **List**< **T** >

3.2.1 Detailed Description

template<typename T>class ListIterator< T >

Implements a bidirectional iterator for List.

Author

Mark Maloof

Version

1.0, 3/25/10

3.2.2 Constructor & Destructor Documentation

3.2.2.1 template<typename T > ListIterator< T >::ListIterator ( )

Default constructor.

3.2.3 Member Function Documentation

3.2.3.1 template<typename T > bool ListIterator< T >::hasNext ( ) const

Returns true if this iterator has a next object.

Returns

true if this iterator has a next object; false otherwise.

3.2.3.2 template<typename T > bool ListIterator< T >::hasPrevious ( ) const

Returns true if this iterator has a previous object.

Returns

true if this iterator has a previous object; false otherwise.

3.2.3.3 template<typename T > T & ListIterator< T >::next ( ) throw NoSuchObject)

Returns a reference to the next object in this iterator.

Returns

a reference to the next object

Exceptions

NoSuchObject	if no such object exists in this iterator

3.2.3.4 template<typename T > T & ListIterator< T >::previous ( ) throw NoSuchObject)

Returns a reference to the previous object in this iterator.

Returns

a reference to the previous object

Exceptions

NoSuchObject	if no such object exists in this iterator

3.2.3.5 template<typename T > void ListIterator< T >::printInternal ( ) const

A utility method that prints the internal state of this iterator.

3.2.3.6 template<typename T > void ListIterator< T >::set (const T & *object*)

Sets the object at the position of this iterator to the specified object.

Parameters

object	the object to be set

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

- iterator.h

3.3 Node< T > Class Template Reference

Public Member Functions

- **Node** (const T &)
- void **setObject** (const T &)
- T & **getObject** ()
- void **setNextPtr** (Node< T > *)
- Node< T > * **getNextPtr** () const
- void **setPrevPtr** (Node< T > *)
- Node< T > * **getPrevPtr** () const

Private Attributes

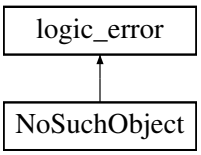
- T **object**
- Node< T > * **nextPtr**
- Node< T > * **prevPtr**

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

- node.h

3.4 NoSuchObject Class Reference

Inheritance diagram for NoSuchObject:



Public Member Functions

- **NoSuchObject** (const string &what)

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

- nosuchobject.h

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