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1.1 Class Hierarchy

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

Chapter 2

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2.1 Class List

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Chapter 3

File Index

3.1 File List

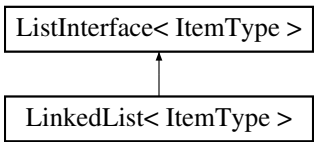
Here is a list of all documented files with brief descriptions:

Chapter 4

Class Documentation

4.1 LinkedList< ItemType > Class Template Reference

Inheritance diagram for LinkedList< ItemType >:



Public Member Functions

- LinkedList ()

  Constructs an empty linked list.
- LinkedList (const LinkedList< ItemType > &other)

  Copies the contents of another linked list.
- virtual ~LinkedList ()

  Destructs the linked list object.
- bool isEmpty () const

  Sees whether this list is empty.
- int getLength () const
- bool insert (int newPosition, const ItemType &newEntry)
- bool remove (int position)
- void clear ()
- ItemType getEntry (int position) const throw (PrecondViolatedExcept)

  Gets the entry found at the given position.
- void replace (int position, const ItemType &newEntry) throw (PrecondViolatedExcept)

  Replaces the entry at the given position with the specified new entry.

4.1.1 Constructor & Destructor Documentation

4.1.1.1 template<class ItemType > LinkedList< ItemType >::LinkedList (const LinkedList< ItemType > & *other*)

Copies the contents of another linked list.

Parameters

other	The linked list to copy.

4.1.2 Member Function Documentation

4.1.2.1 template<class ItemType > void LinkedList< ItemType >::clear ( ) [virtual]

Removes all entries from this list.

Postcondition

List contains no entries and the count of items is 0.

Implements ListInterface< ItemType >.

4.1.2.2 template<class ItemType > ItemType LinkedList< ItemType >::getEntry (int *position*) const throw PrecondViolatedExcept) [virtual]

Gets the entry found at the given position.

Throws PrecondViolatedExcept on precondition violation.

Precondition

getLength() != 0, 1 <= position <= getLength()

Parameters

position	The position of the entry to return.

Returns

The entry at the specified position.

Implements ListInterface< ItemType >.

4.1.2.3 template<class ItemType > int LinkedList< ItemType >::getLength ( ) const [virtual]

Gets the current number of entries in this list.

Returns

The integer number of entries currently in the list.

Implements ListInterface< ItemType >.

4.1.2.4 template<class ItemType > bool LinkedList< ItemType >::insert (int *newPosition,* const ItemType & *newEntry*) [virtual]

Inserts an entry into this list at a given position.

Precondition

None.

Postcondition

If 1 <= position <= getLength() + 1 and the insertion is successful, newEntry is at the given position in the list, other entries are renumbered accordingly, and the returned value is true.

Parameters

newPosition	The list position at which to insert newEntry.
newEntry	The entry to insert into the list.

Returns

True if insertion is successful, or false if not.

Implements ListInterface< ItemType >.

4.1.2.5 template<class ItemType > bool LinkedList< ItemType >::isEmpty ( ) const [virtual]

Sees whether this list is empty.

Returns

True if the list is empty, false othersise.

Implements ListInterface< ItemType >.

4.1.2.6 template<class ItemType > bool LinkedList< ItemType >::remove (int *position*) [virtual]

Removes the entry at a given position from this list.

Precondition

None.

Postcondition

If 1 <= position <= getLength() and the removal is successful, the entry at the given position in the list is removed, other items are renumbered accordingly, and the returned value is true.

Parameters

position	The list position of the entry to remove.

Returns

True if removal is successful, or false if not.

Implements ListInterface< ItemType >.

4.1.2.7 template<class ItemType > void LinkedList< ItemType >::replace (int *position*, const ItemType & *newEntry*) throw PrecondViolatedExcept) [virtual]

Replaces the entry at the given position with the specified new entry.

Throws PrecondViolatedExcept on precondition violation.

Precondition

getLength() != 0, 1 <= position <= getLength()

Postcondition

The entry at the given position has been replaced.

Parameters

position	The position of the entry to replace.
newEntry	The new value of the entry.

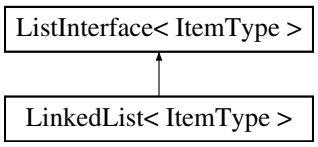
Implements ListInterface< ItemType >.

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

- LinkedList.h
- LinkedList.cpp

4.2 ListInterface< ItemType > Class Template Reference

Inheritance diagram for ListInterface< ItemType >:



Public Member Functions

- virtual bool isEmpty () const =0
- virtual int getLength () const =0
- virtual bool insert (int newPosition, const ItemType &newEntry)=0
- virtual bool remove (int position)=0
- virtual void clear ()=0
- virtual ItemType getEntry (int position) const =0
- virtual void replace (int position, const ItemType &newEntry)=0

4.2.1 Member Function Documentation

4.2.1.1 template<class ItemType > virtual void ListInterface< ItemType >::clear ( ) [pure virtual]

Removes all entries from this list.

Postcondition

List contains no entries and the count of items is 0.

Implemented in LinkedList< ItemType >.

4.2.1.2 template<class ItemType > virtual ItemType ListInterface< ItemType >::getEntry (int *position*) const [pure virtual]

Gets the entry at the given position in this list.

Precondition

1 <= position <= getLength().

Postcondition

The desired entry has been returned.

Parameters

position	The list position of the desired entry.

Returns

The entry at the given position.

Implemented in LinkedList< ItemType >.

4.2.1.3 template<class ItemType > virtual int ListInterface< ItemType >::getLength ( ) const [pure virtual]

Gets the current number of entries in this list.

Returns

The integer number of entries currently in the list.

Implemented in LinkedList< ItemType >.

4.2.1.4 template<class ItemType > virtual bool ListInterface< ItemType >::insert (int *newPosition*, const ItemType & *newEntry*) [pure virtual]

Inserts an entry into this list at a given position.

Precondition

None.

Postcondition

If 1 <= position <= getLength() + 1 and the insertion is successful, newEntry is at the given position in the list, other entries are renumbered accordingly, and the returned value is true.

Parameters

newPosition	The list position at which to insert newEntry.
newEntry	The entry to insert into the list.

Returns

True if insertion is successful, or false if not.

Implemented in LinkedList< ItemType >.

4.2.1.5 template<class ItemType > virtual bool ListInterface< ItemType >::isEmpty ( ) const [pure virtual]

Sees whether this list is empty.

Returns

True if the list is empty; otherwise returns false.

Implemented in LinkedList< ItemType >.

4.2.1.6 template<class ItemType > virtual bool ListInterface< ItemType >::remove (int *position*) [pure virtual]

Removes the entry at a given position from this list.

Precondition

None.

Postcondition

If 1 <= position <= getLength() and the removal is successful, the entry at the given position in the list is removed, other items are renumbered accordingly, and the returned value is true.

Parameters

position	The list position of the entry to remove.

Returns

True if removal is successful, or false if not.

Implemented in LinkedList< ItemType >.

4.2.1.7 template<class ItemType > virtual void ListInterface< ItemType >::replace (int *position,* const ItemType & *newEntry*) [pure virtual]

Replaces the entry at the given position in this list.

Precondition

1 <= position <= getLength().

Postcondition

The entry at the given position is newEntry.

Parameters

position	The list position of the entry to replace.
newEntry	The replacement entry.

Implemented in LinkedList< ItemType >.

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

- ListInterface.h

4.3 Node< ItemType > Class Template Reference

Public Member Functions

- Node ()

  Construct an empty node.
- Node (const ItemType &anItem)

  Construct a node containing the given item.

- Node (const ItemType &anItem, Node< ItemType > *nextNodePtr)
  Construct a node containing the given item and pointing to the given next node.
- void setItem (const ItemType &anItem)
  Set the contained item to the given item.
- void setNext (Node< ItemType > *nextNodePtr)
  Set the next node to the given node.
- ItemType getItem () const
  Get the item contained by this node.
- Node< ItemType > * **getNext** () const

4.3.1 Constructor & Destructor Documentation

4.3.1.1 template<class ItemType > Node< ItemType >::Node (const ItemType & *anItem*)

Construct a node containing the given item.

Postcondition

The node will contain the given item.

Parameters

anItem	The item to contain.

4.3.1.2 template<class ItemType > Node< ItemType >::Node (const ItemType & *anItem*, Node< ItemType > * *nextNodePtr*)

Construct a node containing the given item and pointing to the given next node.

Postcondition

The node will contain the given item and will point to the given next node.

Parameters

anItem	The item to contain.
nextNodePtr	The pointer to the next node.

4.3.2 Member Function Documentation

4.3.2.1 template<class ItemType > ItemType Node< ItemType >::getItem ( ) const

Get the item contained by this node.

Returns

The item contained by this node.

4.3.2.2 template<class ItemType > void Node< ItemType >::setItem (const ItemType & *anItem*)

Set the contained item to the given item.

Postcondition

The item will have been set to the given item.

Parameters

anItem	The new item to be contained.

4.3.2.3 template<class ItemType > void Node< ItemType >::setNext (Node< ItemType > * *nextNodePtr*)

Set the next node to the given node.

Postcondition

This node will point to the given next node.

Parameters

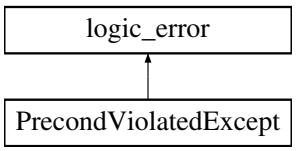
nextNodePtr	The pointer to the next node.

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

- Node.h
- Node.cpp

4.4 PrecondViolatedExcept Class Reference

Inheritance diagram for PrecondViolatedExcept:



Public Member Functions

- PrecondViolatedExcept (const std::string &message="")
  Construct a PrecondViolatedExcept with the given message.

4.4.1 Constructor & Destructor Documentation

4.4.1.1 PrecondViolatedExcept::PrecondViolatedExcept (const std::string & *message* = " ")

Construct a PrecondViolatedExcept with the given message.

Postcondition

The constructed object's message will match the one specified by the message parameter.

Parameters

message	The message to be held.

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

- PrecondViolatedExcept.h
- PrecondViolatedExcept.cpp

Chapter 5

File Documentation

5.1 LinkedList.cpp File Reference

Implementation file for the LinkedList data type.

```
#include "LinkedList.h"
```

5.1.1 Detailed Description

Implementation file for the LinkedList data type.

Author

Matthew Bauer

Implements the LinkedList data type Adapted from/inspired by "Data Abstractions & Problem Solving with C++" Seventh Edition by Frank M. Carrano and Timothy M. Henry.

5.2 LinkedList.h File Reference

Interface file for the LinkedList data type.

```
#include "ListInterface.h"
#include "Node.h"
#include "PrecondViolatedExcept.h"
#include "LinkedList.cpp"
```

Classes

- class LinkedList< ItemType >

5.2.1 Detailed Description

Interface file for the LinkedList data type.

Author

Matthew Bauer

Specifies the interface of the LinkedList data type Adapted from/inspired by "Data Abstractions & Problem Solving with C++" Seventh Edition by Frank M. Carrano and Timothy M. Henry.

5.3 ListInterface.h File Reference

Interface file for the List ADT.

Classes

- class ListInterface< ItemType >

5.3.1 Detailed Description

Interface file for the List ADT.

Author

Rory Pierce

Specifies the implementation contract of the List ADT

Version

0.10

Adapted from Frank M. Carrano and Timothy M. Henry Copyright (c) 2017 Pearson Education, Hoboken, New Jersey.

5.4 Node.cpp File Reference

Implementation file for the Node data type.

```
#include "Node.h"
```

5.4.1 Detailed Description

Implementation file for the Node data type.

Author

Matthew Bauer

Implements the Node data type

5.5 Node.h File Reference

Interface file for the Node data type.

```
#include "Node.cpp"
```

Classes

- class Node< ItemType >

5.5.1 Detailed Description

Interface file for the Node data type.

Author

Matthew Bauer

Specifies the interface of the Node data type Specification taken from "Data Abstractions a& Problem Solving with C++" Seventh Edition by Frank Carrano and Timothy M.; doxygen comments written by Matthew Bauer (student).

5.6 PrecondViolatedExcept.cpp File Reference

Implementation file for the PrecondViolatedExcept data type.

```
#include "PrecondViolatedExcept.h"
```

5.6.1 Detailed Description

Implementation file for the PrecondViolatedExcept data type.

Author

Matthew Bauer

Implements the PrecondViolatedExcept data type Code taken from "Data Abstractions & Problem Solving with C++" Seventh Edition by Frank Carrano and Timothy M.

5.7 PrecondViolatedExcept.h File Reference

Interface file for the PrecondViolatedExcept data type.

```
#include <stdexcept>
#include <string>
```

Classes

- class PrecondViolatedExcept

5.7.1 Detailed Description

Interface file for the PrecondViolatedExcept data type.

Author

Matthew Bauer

Specifies the interface of the PrecondViolatedExcept data type Specification taken from "Data Abstractions & Problem Solving with C++" Seventh Edition by Frank Carrano and Timothy M.; doxygen comments written by Matthew Bauer (student).

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