The Container and Sequence Classes

pa11

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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

File Index

3.1 File List

Here is a list of all files with brief descriptions:

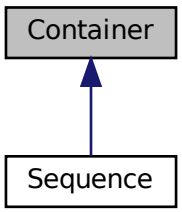
Chapter 4

Class Documentation

4.1 Container Class Reference

`#include <Container.h>`

Inheritance diagram for Container:



Public Types

- using value_type = int
- using size_type = std::size_t

Public Member Functions

- Container ()

  Constructs the Container.
- size_type size () const
- bool empty () const
- void insert (const value_type &value)
- void erase (const value_type &target)
- void clear ()

  After this call, size() returns zero.
- size_type count (const value_type &target) const
- bool contains (const value_type &target) const
- void write (std::ostream &output=std::cout) const

Static Public Attributes

- static const size_type CAPACITY = 20

  Maximum storage capacity.

Protected Attributes

- size_type used

  Number of items in Container.
- value_type data [CAPACITY]

  Array of items.

4.1.1 Detailed Description

A Container is a general-purpose container that stores a set of possibly non-unique values of type int. Internally, the items are not maintained in any particular order.

4.1.2 Member Typedef Documentation

4.1.2.1 size_type

```
using Container::size_type = std::size_t
```

4.1.2.2 value_type

```
using Container::value_type = int
```

4.1.3 Constructor & Destructor Documentation

4.1.3.1 Container()

```
Container::Container ( )  [inline]
```

Constructs the Container.

4.1.4 Member Function Documentation

4.1.4.1 clear()

```
void Container::clear ( )  [inline]
```

After this call, size() returns zero.

4.1.4.2 contains()

```
bool Container::contains (
            const value_type & target ) const  [inline]
```

Checks if there is an item with its value equal to the target.

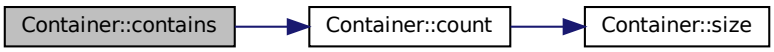
Parameters

target	Key value of the item to search for.

Returns

true if there is such an item, otherwise false.

Here is the call graph for this function:



4.1.4.3 count()

```
Container::size_type Container::count (
            const value_type & target ) const
```

Returns the number of items equal to the target.

Parameters

target	Key value of the item(s) to count.

Returns

Number of items with value equal to the target.

Here is the call graph for this function:

Here is the caller graph for this function:

4.1.4.4 empty()

```
bool Container::empty ( ) const  [inline]
```

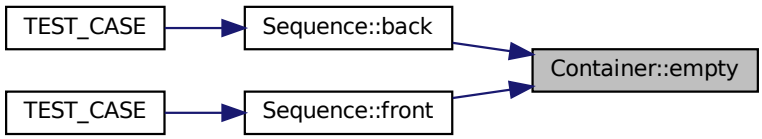
Checks if the container has no items, i.e. whether size() == 0

Returns

true if the container has no items, false otherwise.

Here is the call graph for this function:

Here is the caller graph for this function:



4.1.4.5 erase()

```
void Container::erase (
            const value_type & target )
```

Removes all items from the container equal to the target value. Internally, the items are not maintained in any particular order.

Parameters

target	Key value of the items to remove.

Here is the call graph for this function:

4.1.4.6 insert()

```
void Container::insert (
            const value_type & value )
```

Inserts an item into the container. Internally, the items are not maintained in any particular order.

Precondition

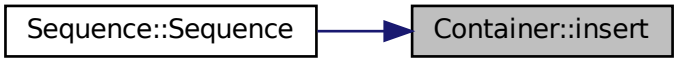
size() $<$ CAPACITY

Parameters

value	Element value to insert.

Here is the call graph for this function:

Here is the caller graph for this function:



4.1.4.7 size()

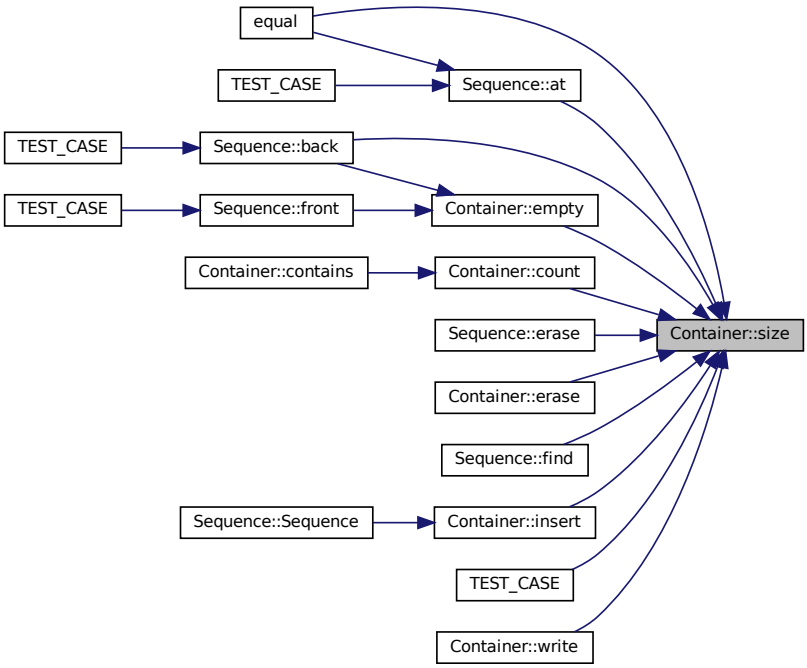
```
size_type Container::size ( ) const  [inline]
```

Returns the number of items in the container.

Returns

The number of items in the container.

Here is the caller graph for this function:



4.1.4.8 write()

```
void Container::write (
            std::ostream & output = std::cout ) const
```

Writes all items to an output stream in the format: {42,73,0,-59,7}

Parameters

output	The output stream (defaults to std::cout).

Here is the call graph for this function:

4.1.5 Member Data Documentation

4.1.5.1 CAPACITY

```
const size_type Container::CAPACITY = 20  [static]
```

Maximum storage capacity.

4.1.5.2 data

```
value_type Container::data[CAPACITY]  [protected]
```

Array of items.

4.1.5.3 used

```
size_type Container::used  [protected]
```

Number of items in Container.

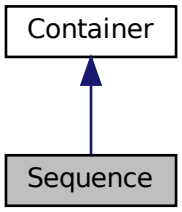
The documentation for this class was generated from the following files:

- Container.h
- Container.cpp

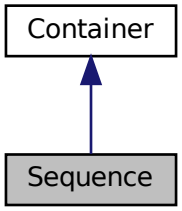
4.2 Sequence Class Reference

`#include <Sequence.h>`

Inheritance diagram for Sequence:



Collaboration diagram for Sequence:



Public Member Functions

- Sequence ()=default
  Default ctor.
- Sequence (const std::initializer_list< value_type > &ilist)
  Initializer list ctor.
- void erase (size_type pos)
  Removes a single item from the container.
- value_type & at (size_type pos)
  Access specified element.
- const value_type & at (size_type pos) const
- value_type & front ()
  Access the first element.
- const value_type & front () const
- value_type & back ()

Access the last element.

- const value_type & back () const
- size_type find (const value_type &target, size_type pos=0) const

  Finds the first element equal to the given target.
- bool contains (const value_type &) const =delete

  Delete contains() function from Sequence interface.

Additional Inherited Members

4.2.1 Detailed Description

A Sequence is a Container that stores a set of values, maintaining insertion order.

4.2.2 Constructor & Destructor Documentation

4.2.2.1 Sequence() [1/2]

```
Sequence::Sequence ( )  [default]
```

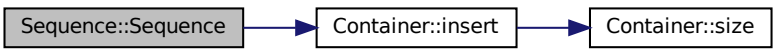
Default ctor.

4.2.2.2 Sequence() [2/2]

```
Sequence::Sequence (
            const std::initializer_list< value_type > & ilist )
```

Initializer list ctor.

Here is the call graph for this function:



4.2.3 Member Function Documentation

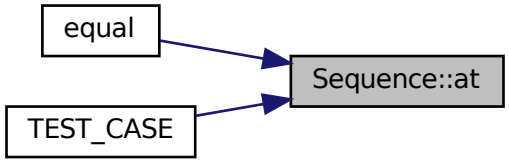
4.2.3.1 at() [1/2]

```
Sequence::value_type & Sequence::at (
            size_type pos )
```

Access specified element.

Here is the call graph for this function:

Here is the caller graph for this function:



4.2.3.2 at() [2/2]

```
const Sequence::value_type & Sequence::at (
            size_type pos ) const
```

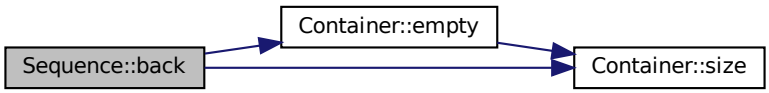
Here is the call graph for this function:

4.2.3.3 back() [1/2]

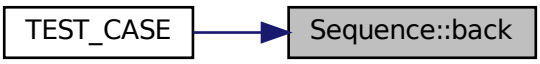
```
const Sequence::value_type & Sequence::back ( )
```

Access the last element.

Here is the call graph for this function:



Here is the caller graph for this function:



4.2.3.4 back() [2/2]

```
const value_type& Sequence::back ( ) const
```

4.2.3.5 contains()

```
bool Sequence::contains (
            const value_type &  ) const  [delete]
```

Delete contains() function from Sequence interface.

4.2.3.6 erase()

```
void Sequence::erase (
            size_type pos )
```

Removes a single item from the container.

Here is the call graph for this function:

4.2.3.7 find()

```
Sequence::size_type Sequence::find (
            const value_type & target,
            size_type pos = 0 ) const
```

Finds the first element equal to the given target.

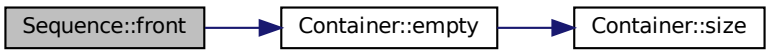
Here is the call graph for this function:

4.2.3.8 front() [1/2]

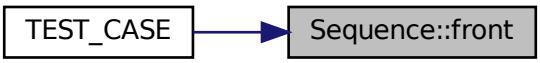
```
const Sequence::value_type & Sequence::front ( )
```

Access the first element.

Here is the call graph for this function:



Here is the caller graph for this function:



4.2.3.9 front() [2/2]

```
const value_type& Sequence::front ( ) const
```

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

- Sequence.h
- Sequence.cpp

Chapter 5

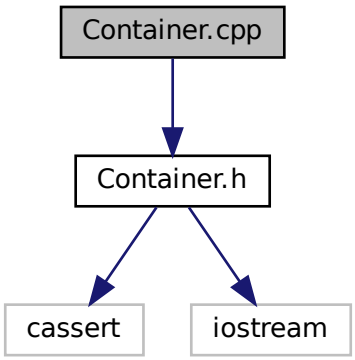
File Documentation

5.1 Container.cpp File Reference

This is the implementation file for the Container class.

```
#include "Container.h"
```

Include dependency graph for Container.cpp:



5.1.1 Detailed Description

This is the implementation file for the Container class.

Author

Kevin Mess kevin.mess@csn.edu

Date

05/26/2021

Note

I pledge my word of honor that I have complied with the CSN Academic Integrity Policy while completing this assignment.

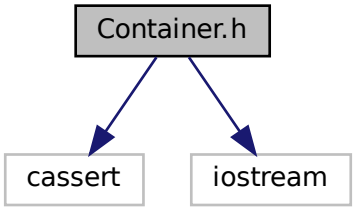
This is a sample solution and is but one way to solve the problem.

5.2 Container.h File Reference

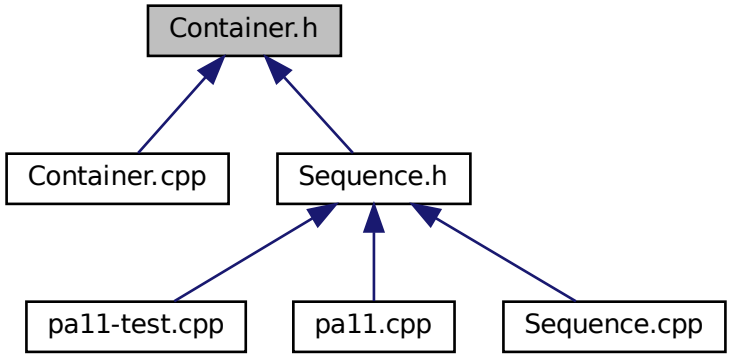
This is the interface file for the Container class.

```
#include <cassert>
#include <iostream>
```

Include dependency graph for Container.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Container

5.2.1 Detailed Description

This is the interface file for the Container class.

Author

Kevin Mess kevin.mess@csn.edu

Date

05/26/2021

Note

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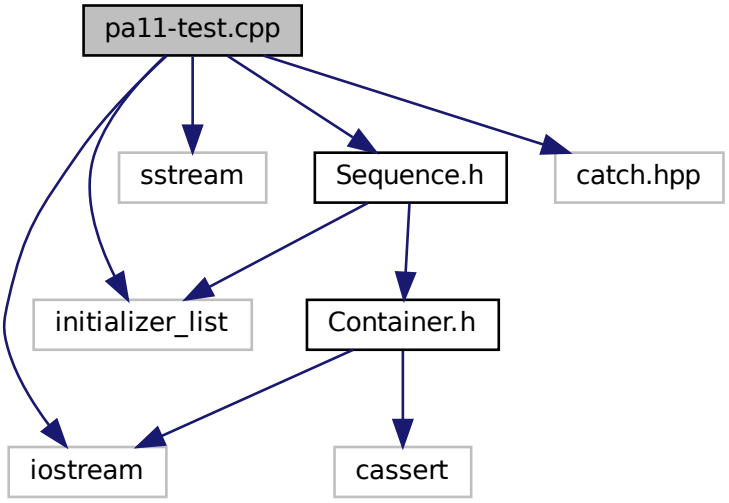
This is a sample solution and is but one way to solve the problem.

5.3 pa11-test.cpp File Reference

```
#include <initializer_list>
#include <iostream>
#include <sstream>
#include "Sequence.h"
#include <catch.hpp>
```

Include dependency graph for pa11-test.cpp:



Macros

- #define CATCH_CONFIG_MAIN

Functions

- TEST_CASE ("Sequence::Sequence()")
- TEST_CASE ("Sequence::Sequence(std::initializer_list<>&")
- TEST_CASE ("Sequence::erase()")
- TEST_CASE ("Sequence::at()")
- TEST_CASE ("Sequence::front()")
- TEST_CASE ("Sequence::back()")
- TEST_CASE ("Sequence::find()")
- TEST_CASE ("equal()")

5.3.1 Macro Definition Documentation

5.3.1.1 CATCH_CONFIG_MAIN

```
#define CATCH_CONFIG_MAIN
```

5.3.2 Function Documentation

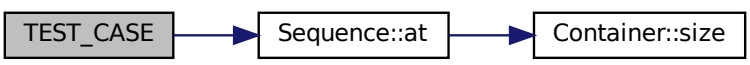
5.3.2.1 TEST_CASE() [1/8]

```
TEST_CASE (
              "equal()"  )
```

5.3.2.2 TEST_CASE() [2/8]

```
TEST_CASE (
              "Sequence::at()"  )
```

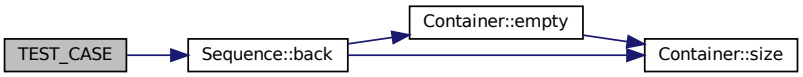
Here is the call graph for this function:



5.3.2.3 TEST_CASE() [3/8]

```
TEST_CASE (
            "Sequence::back()"  )
```

Here is the call graph for this function:



5.3.2.4 TEST_CASE() [4/8]

```
TEST_CASE (
            "Sequence::erase()"  )
```

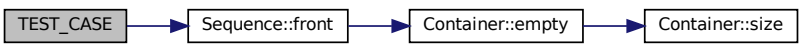
5.3.2.5 TEST_CASE() [5/8]

```
TEST_CASE (
            "Sequence::find()"  )
```

5.3.2.6 TEST_CASE() [6/8]

```
TEST_CASE (
            "Sequence::front()"  )
```

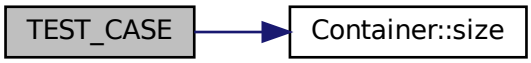
Here is the call graph for this function:



5.3.2.7 TEST_CASE() [7/8]

```
TEST_CASE (
            "Sequence::Sequence()"  )
```

Here is the call graph for this function:



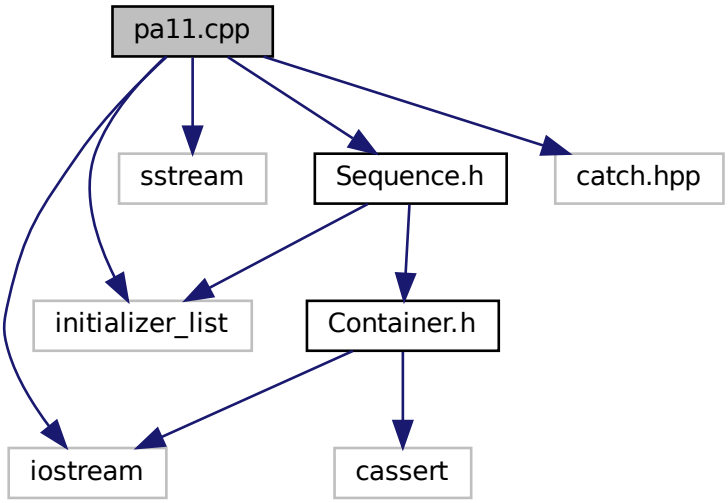
5.3.2.8 TEST_CASE() [8/8]

```
TEST_CASE ( )
```

5.4 pa11.cpp File Reference

```
#include <initializer_list>
#include <iostream>
#include <sstream>
#include "Sequence.h"
#include <catch.hpp>
```

Include dependency graph for pa11.cpp:



Macros

- #define CATCH_CONFIG_MAIN

Functions

- TEST_CASE ("Sequence::Sequence()")
- TEST_CASE ("Sequence::Sequence(std::initializer_list<>&")
- TEST_CASE ("Sequence::erase()")
- TEST_CASE ("Sequence::at()")
- TEST_CASE ("Sequence::front()")
- TEST_CASE ("Sequence::back()")
- TEST_CASE ("Sequence::find()")
- TEST_CASE ("equal()")

5.4.1 Macro Definition Documentation

5.4.1.1 CATCH_CONFIG_MAIN

```
#define CATCH_CONFIG_MAIN
```

5.4.2 Function Documentation

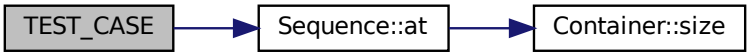
5.4.2.1 TEST_CASE() [1/8]

```
TEST_CASE (
            "equal()"  )
```

5.4.2.2 TEST_CASE() [2/8]

```
TEST_CASE (
            "Sequence::at()"  )
```

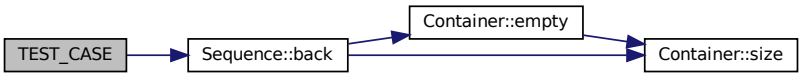
Here is the call graph for this function:



5.4.2.3 TEST_CASE() [3/8]

```
TEST_CASE (
            "Sequence::back()"  )
```

Here is the call graph for this function:



5.4.2.4 TEST_CASE() [4/8]

```
TEST_CASE (
            "Sequence::erase()"  )
```

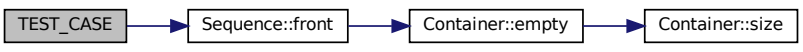
5.4.2.5 TEST_CASE() [5/8]

```
TEST_CASE (
            "Sequence::find()"  )
```

5.4.2.6 TEST_CASE() [6/8]

```
TEST_CASE (
            "Sequence::front()"  )
```

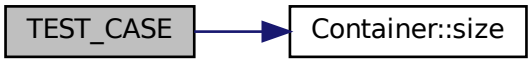
Here is the call graph for this function:



5.4.2.7 TEST_CASE() [7/8]

```
TEST_CASE (
             "Sequence::Sequence()"  )
```

Here is the call graph for this function:



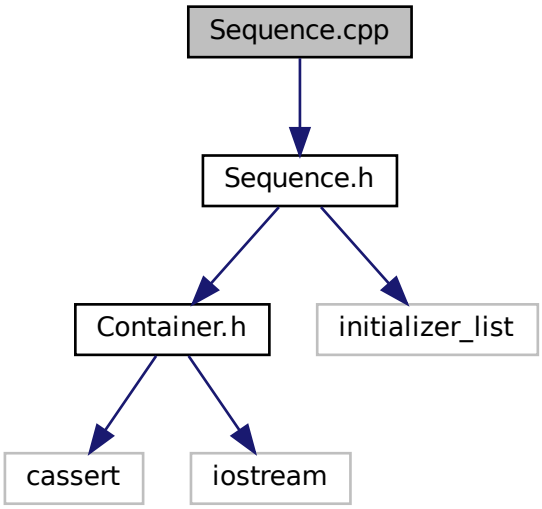
5.4.2.8 TEST_CASE() [8/8]

```
TEST_CASE ( )
```

5.5 Sequence.cpp File Reference

```
#include "Sequence.h"
```

Include dependency graph for Sequence.cpp:



Functions

- bool equal (const Sequence &lhs, const Sequence &rhs)

  Returns true if the lhs parameter compares equal to the rhs parameter.

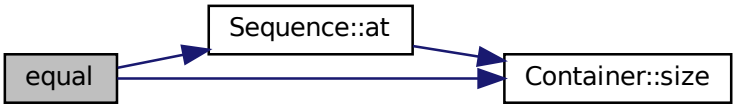
5.5.1 Function Documentation

5.5.1.1 equal()

```
bool equal (
            const Sequence & lhs,
            const Sequence & rhs )
```

Returns true if the lhs parameter compares equal to the rhs parameter.

Here is the call graph for this function:

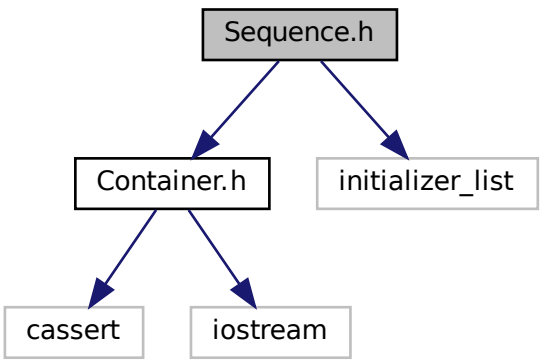


5.6 Sequence.h File Reference

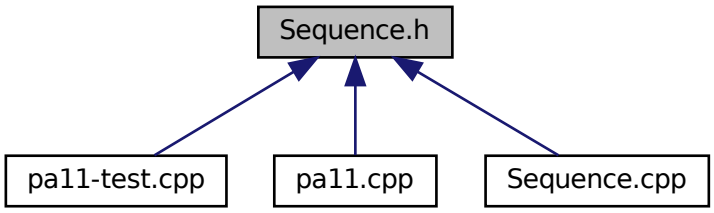
This is the interface for the Sequence class.

```
#include "Container.h"
#include <initializer_list>
```

Include dependency graph for Sequence.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Sequence

Functions

- bool equal (const Sequence &lhs, const Sequence &rhs)

  Returns true if the lhs parameter compares equal to the rhs parameter.

5.6.1 Detailed Description

This is the interface for the Sequence class.

Author

Kevin Mess kevin.mess@csn.edu

Date

05/28/2021

Note

I pledge my word of honor that I have complied with the CSN Academic Integrity Policy while completing this assignment.

This is a sample solution and is but one way to solve the problem.

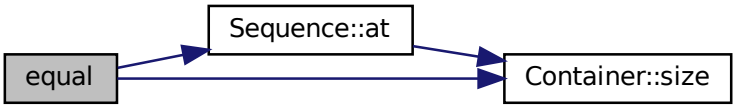
5.6.2 Function Documentation

5.6.2.1 equal()

```
bool equal (
            const Sequence & lhs,
            const Sequence & rhs )
```

Returns true if the lhs parameter compares equal to the rhs parameter.

Here is the call graph for this function:



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