Project 5

Tanner Jones
1 Version
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File List

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

Class Documentation

DateType Class Reference

Public Member Functions

- **DateType** ()
  Default constructor.
- **DateType** (char *newDate)
  Initialization constructor.

Public Attributes

- char **date** [STD_STR_LEN]

Static Public Attributes

- static const int **STD_STR_LEN** = 25

Constructor & Destructor Documentation

DateType::DateType ()

Default constructor.

Constructs empty **DateType**

Parameters:

None	

Note:

None

DateType::DateType (char * *newDate*)

Initialization constructor.

Constructs **DateType** with data components

Parameters:

in	new data, in string form

Note:

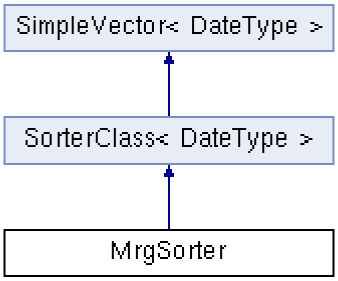
None

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

- **DateType.h**
- **DateType.cpp**

MrgSorter Class Reference

Inheritance diagram for MrgSorter:



Public Member Functions

- **MrgSorter** ()
  Default constructor.
- **MrgSorter** (int capacity)
  Initialization constructor.
- **MrgSorter** (const **SorterClass**< **DateType** > &copiedSorter)
  Copy constructor.
- virtual **~MrgSorter** ()
  Destructor.
- virtual int **compareTo** (const **DateType** &lhObject, const **DateType** &rhObject)
  compareTo
- virtual bool **sort** ()
  sort
- void **mergeSort** (**SimpleVector** &temp, int low, int high)
  mergeSort
- void **merge** (**SimpleVector** &temp, int low, int pivot, int high)
  merge

Static Public Attributes

- static const char **NULL_CHAR** = '\0'
- static const char **SPACE** = ' '
- static const int **MONTH_NAME_WIDTH** = 3
- static const int **MAX_YEAR_ALLOWED** = 3000

Constructor & Destructor Documentation

MrgSorter::MrgSorter ()

Default constructor.

Constructs sorter class with default vector class initialization

Parameters:

None	

Note:

None

MrgSorter::MrgSorter (int *capacity*)

Initialization constructor.

Constructs sorter class with specified vector class initialization

Parameters:

None	

Note:

None

MrgSorter::MrgSorter (const SorterClass< DateType > & *copiedSorter*)

Copy constructor.

Constructs sorter class with copied object

Parameters:

None	

Note:

None

MrgSorter::~MrgSorter () `[virtual]`

Destructor.

Destructs object after going out of bonds

Parameters:

None	

Note:

None

Member Function Documentation

int MrgSorter::compareTo (const DateType & *lhObject*, const DateType & *rhObject*) `[virtual]`

compareTo

Compares two sets of dates to see if one is different then the other

Parameters:

the	left and right date object

Note:

None

Reimplemented from **SorterClass< DateType >** (*p.23*).

void MrgSorter::merge (SimpleVector & *temp*, int *start*, int *mid*, int *end*)

merge

splits vector and merges them

Parameters:

temp	vector, start, middle, and end index

Note:

None

void MrgSorter::mergeSort (SimpleVector & *temp*, int *start*, int *end*)

mergeSort

sorts a list of objects

Parameters:

two	ints the first and last index

Note:

None

bool MrgSorter::sort () `[virtual]`

sort

sorts a list of objects in a merge sort

Parameters:

none	

Note:

None

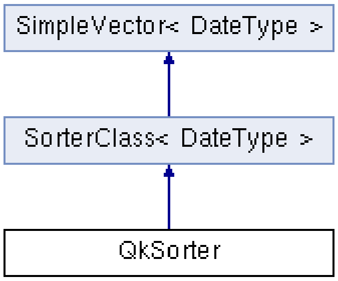
Reimplemented from **SorterClass< DateType >** (*p.24*).

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

- **MrgSorter.h**
- **MrgSorter.cpp**

QkSorter Class Reference

Inheritance diagram for QkSorter:



Public Member Functions

- **QkSorter** ()
  Default constructor.
- **QkSorter** (int capacity)
  Initialization constructor.
- **QkSorter** (const **SorterClass**< **DateType** > &copiedSorter)
  Copy constructor.
- virtual **~QkSorter** ()
  Destructor.
- virtual int **compareTo** (const **DateType** &lhObject, const **DateType** &rhObject)
  compareTo
- virtual bool **sort** ()
  sort
- int **partition** (int first, int last)
  insertionSort
- void **quickSort** (int first, int last)
  insertionSort

Static Public Attributes

- static const char **NULL_CHAR** = '\0'
- static const char **SPACE** = ' '
- static const int **MONTH_NAME_WIDTH** = 3
- static const int **MAX_YEAR_ALLOWED** = 3000

Constructor & Destructor Documentation

QkSorter::QkSorter ()

Default constructor.

Constructs sorter class with default vector class initialization

Parameters:

None	

Note:

None

QkSorter::QkSorter (int *capacity*)

Initialization constructor.

Constructs sorter class with specified vector class initialization

Parameters:

None	

Note:

None

QkSorter::QkSorter (const SorterClass< DateType > & *copiedSorter*)

Copy constructor.

Constructs sorter class with copied object

Parameters:

None	

Note:

None

QkSorter::~QkSorter () `[virtual]`

Destructor.

Destructs object after going out of bonds

Parameters:

None	

Note:

None

Member Function Documentation

int QkSorter::compareTo (const DateType & *lhObject*, const DateType & *rhObject*) `[virtual]`

compareTo

Compares two sets of dates to see if one is different then the other

Parameters:

the	left and right date object

Note:

None

Reimplemented from **SorterClass< DateType >** (*p.23*).

int QkSorter::partition (int *first*, int *last*)

insertionSort

helper function for the quickSort

Parameters:

size	

Note:

None

void QkSorter::quickSort (int *first*, int *last*)

insertionSort

helper function for the quickSort

Parameters:

size	

Note:

None

bool QkSorter::sort () `[virtual]`

sort

sorts a list of objects in a merge sort

Parameters:

none	

Note:

None

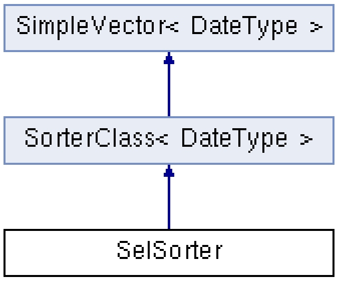
Reimplemented from **SorterClass< DateType >** (*p.24*).

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

- **QkSorter.h**
- **QkSorter.cpp**

SelSorter Class Reference

Inheritance diagram for SelSorter:



Public Member Functions

- **SelSorter** ()
  Default constructor.
- **SelSorter** (int initialCapacity)
  Initialization constructor.
- **SelSorter** (const **SorterClass**< **DateType** > &copiedSorter)
  Copy constructor.
- virtual **~SelSorter** ()
  Class destructor.
- virtual int **compareTo** (const **DateType** &lhObject, const **DateType** &rhObject)
  Object comparison, necessary for sorting.
- virtual bool **sort** ()
  Sorting operation.

Static Public Attributes

- static const char **NULL_CHAR** = '\0'
- static const char **SPACE** = ' '
- static const int **MONTH_NAME_WIDTH** = 3
- static const int **MAX_YEAR_ALLOWED** = 3000

Constructor & Destructor Documentation

SelSorter::SelSorter ()

Default constructor.

Constructs sorter class with default vector class initialization

Parameters:

None	

Note:

None

SelSorter::SelSorter (int *initialCapacity*)

Initialization constructor.

Constructs sorter class with specified vector class initialization

Parameters:

in	initial capacity

Note:

None

SelSorter::SelSorter (const SorterClass< DateType > & *copiedSorter*)

Copy constructor.

Constructs sorter class with copied object

Parameters:

in	other **SorterClass** object

Note:

None

SelSorter::~SelSorter () `[virtual]`

Class destructor.

Destructs test sorter class

Parameters:

in	None

Note:

Implements **SorterClass** -> **SimpleVector** destructor

Member Function Documentation

int SelSorter::compareTo (const DateType & *lhObject*, const DateType & *rhObject*) `[virtual]`

Object comparison, necessary for sorting.

Compares objects mathematically, returns value < 0 if lhO < rhO returns 0 if lhO = rhO returns value > 0 if lhO > rhO

Parameters:

in	Left hand object, right hand object

Note:

Simple mathematical base operation; assumed to be overridden

Reimplemented from **SorterClass< DateType >** (*p.23*).

bool SelSorter::sort () `[virtual]`

Sorting operation.

Virtual sort method that is overridden to use various sorting strategies

Parameters:

in	None

Note:

Derived methods use specific strategy to sort objects

Sets sort success flag to true at start; supporting operations used to create dates, months, years will set the flag to false if there is an incorrect date; method returns success flag

Reimplemented from **SorterClass< DateType >** (*p.24*).

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

- **SelSorter.h**
- **SelSorter.cpp**

SimpleTimer Class Reference

Public Member Functions

- **SimpleTimer** ()
  Default constructor.
- **~SimpleTimer** ()
  Default constructor.
- void **start** ()
  Start control.
- void **stop** ()
  Stop control.
- void **getElapsedTime** (char *timeStr)

Static Public Attributes

- static const char **NULL_CHAR** = '\0'
- static const char **RADIX_POINT** = '.'

Constructor & Destructor Documentation

SimpleTimer::SimpleTimer ()

Default constructor.

Constructs Timer class

Parameters:

None	

Note:

set running flag to false

SimpleTimer::~SimpleTimer ()

Default constructor.

Destructs Timer class

Parameters:

None	

Note:

No data to clear

Member Function Documentation

void SimpleTimer::start ()

Start control.

Takes initial time data

Parameters:

None	

Note:

None

void SimpleTimer::stop ()

Stop control.

Takes final time data, calculates duration

Parameters:

None	

Note:

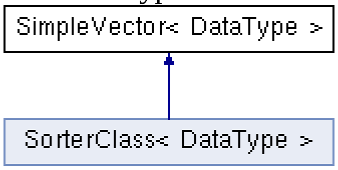
None

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

- **SimpleTimer.h**
- **SimpleTimer.cpp**

SimpleVector< DataType > Class Template Reference

Inheritance diagram for SimpleVector< DataType >:



Public Member Functions

- **SimpleVector** ()
  Default constructor.
- **SimpleVector** (int newCapacity)
  Initialization constructor.
- **SimpleVector** (int newCapacity, const DataType &fillValue)
  Initialization constructor.
- **SimpleVector** (const **SimpleVector** &copiedVector)
  Copy constructor.
- **~SimpleVector** ()
  object destructor
- const **SimpleVector** & **operator=** (const **SimpleVector** &rhVector)
  assignment operation overload
- int **getCapacity** () const
  vector capacity accessor
- int **getSize** () const
  vector size accessor
- DataType & **operator[]** (int index)   throw (logic_error)
  vector overloaded bracket operation
- const DataType & **operator[]** (int index) const   throw (logic_error)
  vector overloaded bracket operation
- void **setValueAt** (int index, const DataType &item)   throw (logic_error)
  vector data setting operation
- void **getValueAt** (int index, DataType &item) const   throw (logic_error)
  vector data getting operation
- void **grow** (int growBy)
  vector resize larger operation
- void **shrink** (int shrinkBy)   throw (logic_error)
  vector resize smaller operation
- void **incrementSize** ()
  vector size mutator - increase
- void **decrementSize** ()
  vector size mutator - decrease

Static Public Attributes

- static const int **DEFAULT_CAPACITY** = 10

Constructor & Destructor Documentation

template<class DataType > SimpleVector< DataType >::SimpleVector ()

Default constructor.

Constructs vector capacity to default and vector size to zero creates default size data array

Parameters:

None	

Note:

None

template<class DataType > SimpleVector< DataType >::SimpleVector (int *newCapacity*)

Initialization constructor.

Constructs vector capacity to given capacity and vector size to zero creates array of given capacity size

Parameters:

in	capacity with which to initialize vector

Note:

None

template<class DataType> SimpleVector< DataType >::SimpleVector (int *newCapacity*, const DataType & *fillValue*)

Initialization constructor.

Constructs vector to given capacity and zero size and sets each element to given fill value

Parameters:

in	capacity with which to initialize vector
in	fill value with which to initialize each element

Note:

None

template<class DataType> SimpleVector< DataType >::SimpleVector (const SimpleVector< DataType > & *copiedVector*)

Copy constructor.

Constructs vector capacity to default and vector size to zero creates default size data array

Parameters:

in	Other vector with which this vector is constructed

Note:

Uses copyVector to move data into this vector

template<class DataType > SimpleVector< DataType >::~SimpleVector ()

object destructor

If capacity is greater than zero, releases memory to system

Parameters:

None	

Note:

None

Member Function Documentation

template<class DataType > void SimpleVector< DataType >::decrementSize ()

vector size mutator - decrease

decreases vector size count

Parameters:

None	

Note:

has no effect on operation of vector; provided as convenience to user/programmer

template<class DataType > int SimpleVector< DataType >::getCapacity () const

vector capacity accessor

returns capacity of this vector

Parameters:

None	

Note:

None

template<class DataType > int SimpleVector< DataType >::getSize () const

vector size accessor

returns size of this vector

Parameters:

None	

Note:

None

template<class DataType> void SimpleVector< DataType >::getValueAt (int *index*, DataType & *item*) const throw logic_error)

vector data getting operation

allows direct access of the data from the vector

Parameters:

in	index of element to be assigned
in	data item to be retrieved from array

Note:

throws logic error if index is out of bounds

template<class DataType > void SimpleVector< DataType >::grow (int *growBy*)

vector resize larger operation

increases vector capacity by amount given in parameter

Parameters:

in	delta size for growth of vector

Note:

creates new data list, copies using copyVector, then deletes old list

template<class DataType > void SimpleVector< DataType >::incrementSize ()

vector size mutator - increase

increases vector size count

Parameters:

None	

Note:

has no effect on operation of vector; provided as convenience to user/programmer

template<class DataType > const SimpleVector< DataType > & SimpleVector< DataType >::operator= (const SimpleVector< DataType > & *rhVector*)

assignment operation overload

Assigns data from right-hand object to this object

Parameters:

in	right-hand vector object

Note:

Uses copyVector to move data into this vector

template<class DataType > DataType & SimpleVector< DataType >::operator[] (int *index*) throw logic_error)

vector overloaded bracket operation

allows assignment of data to element in this vector

Parameters:

in	index of element to be assigned

Note:

throws logic error if index is out of bounds

template<class DataType > const DataType & SimpleVector< DataType >::operator[] (int *index*) const throw logic_error)

vector overloaded bracket operation

allows assignment of data from element in this vector

Parameters:

in	index of element to be assigned

Note:

throws logic error if index is out of bounds

template<class DataType> void SimpleVector< DataType >::setValueAt (int *index*, const DataType & *item*) throw logic_error)

vector data setting operation

allows assignment of data directly to the vector

Parameters:

in	index of element to be assigned
in	data item to be stored in array

Note:

throws logic error if index is out of bounds

template<class DataType > void SimpleVector< DataType >::shrink (int *shrinkBy*) throw logic_error)

vector resize smaller operation

decreases vector capacity by amount given in parameter

Parameters:

in	delta size for reduction of vector

Note:

creates new data list, copies using copyVector, then deletes old list

vector does not check size before capacity reduction; if capacity is reduced to less than size, data will be lost

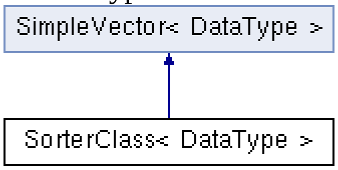
---

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

- **SimpleVector.h**
- **SimpleVector.cpp**

SorterClass< DataType > Class Template Reference

Inheritance diagram for SorterClass< DataType >:



Public Member Functions

- **SorterClass** ()
  Default constructor.
- **SorterClass** (int initialCapacity)
  Initialization constructor.
- **SorterClass** (const **SorterClass**< DataType > &copiedSorter)
  Copy constructor.
- virtual **~SorterClass** ()
  Class destructor.
- virtual void **add** (const DataType &addedObject)
  add item to sorter list
- virtual int **compareTo** (const DataType &lhObject, const DataType &rhObject)
  Object comparison, necessary for sorting.
- virtual bool **sort** ()
  Sorting operation.

Additional Inherited Members

Constructor & Destructor Documentation

template<typename DataType > SorterClass< DataType >::SorterClass ()

Default constructor.

Constructs sorter class with default vector class initialization

Parameters:

None	

Note:

None

template<typename DataType > SorterClass< DataType >::SorterClass (int *initialCapacity*)

Initialization constructor.

Constructs sorter class with specified vector class initialization

Parameters:

in	initial capacity

Note:

None

template<typename DataType> SorterClass< DataType >::SorterClass (const SorterClass< DataType > & *copiedSorter*)

Copy constructor.

Constructs sorter class with copied object

Parameters:

in	other **SorterClass** object

Note:

None

template<typename DataType > SorterClass< DataType >::~SorterClass () `[virtual]`

Class destructor.

Destructs sorter class

Parameters:

in	None

Note:

Implements **SimpleVector** destructor

Member Function Documentation

template<typename DataType> void SorterClass< DataType >::add (const DataType & *addedObject*) `[virtual]`

add item to sorter list

adds item to list for sorting

Parameters:

in	object to be added

Note:

None

template<typename DataType> int SorterClass< DataType >::compareTo (const DataType & *lhObject*, const DataType & *rhObject*) `[virtual]`

Object comparison, necessary for sorting.

Compares objects mathematically, returns value < 0 if lhO < rhO returns 0 if lhO = rhO returns value > 0 if lhO > rhO

Parameters:

in	Left hand object, right hand object

Note:

Simple mathematical base operation; assumed to be overridden

Reimplemented in **SelSorter** (*p.13*), **MrgSorter** (*p.7*), and **QkSorter** (*p.10*).

template<typename DataType > bool SorterClass< DataType >::sort () [virtual]

Sorting operation.

Virtual sort method that can be overridden to use various sorting strategies

Parameters:

in	None

Note:

None, virtual method takes no action, assumed to be overridden

Reimplemented in **SelSorter** (*p.13*), **MrgSorter** (*p.8*), and **QkSorter** (*p.11*).

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

- **SorterClass.h**
- **SorterClass.cpp**

File Documentation

DateType.cpp File Reference

Implementation file for **DateType** class.

```
#include "DateType.h"
#include <cstring>
```

Functions

- ostream & **operator<<** (ostream &outStream, const **DateType** &dateItem)
  ostream output operator

Detailed Description

Implementation file for **DateType** class.

Implements the constructor method of the **DateType** class

Author:

Michael Leverington

Version:

1.00 (11 September 2015)

Requires **DateType.h**

Function Documentation

ostream& operator<< (ostream & *outStream*, const DateType & *dateItem*)

ostream output operator

Free function outputs **DateType** to stream

Parameters:

in	ostream file object
in	**DateType** data item

Note:

None

DateType.h File Reference

Definition file for **DateType** class.
`#include <ostream>`

Classes

- class **DateType**

Functions

- ostream & **operator<<** (ostream &outStream, const **DateType** &dateItem)
  ostream output operator

Detailed Description

Definition file for **DateType** class.

Specifies all data of the **DateType** class, along with the constructor, **DateType** class is entered and stored as a string

Author:

Michael Leverington

Version:

1.00 (11 September 2015)

None

Function Documentation

ostream& operator<< (ostream & *outStream*, const DateType & *dateItem*)

ostream output operator

Free function outputs **DateType** to stream

Parameters:

in	ostream file object
in	**DateType** data item

Note:

None

MrgSorter.cpp File Reference

Implementation file for **MrgSorter** using merge sort, derived from **SorterClass**.

```
#include "MrgSorter.h"
#include "SorterClass.cpp"
#include "SimpleVector.cpp"
```

Detailed Description

Implementation file for **MrgSorter** using merge sort, derived from **SorterClass**.

Author:

Tanner Jones

Implements virtual member methods of the **MrgSorter**

Version:

1.00 (30 September 2015)

Requires **MrgSorter.h**, **SorterClass.cpp**, **SimpleVector.cpp**,

MrgSorter.h File Reference

Definition file for **MrgSorter** using a merge sort, derived from the **SorterClass**.

```
#include "DateType.h"
#include "SorterClass.h"
```

Classes

- class **MrgSorter**

Detailed Description

Definition file for **MrgSorter** using a merge sort, derived from the **SorterClass**.

Author:

Tanner Jones

Specifies all member methods of the **MrgSorter** Class

Version:

1.00 (30 September 2015)

Requires **DateType.h**, **SorterClass.h**

QkSorter.cpp File Reference

Implementation file for **QkSorter** using quick sort, derived from **SorterClass**.

```
#include "QkSorter.h"
#include "SorterClass.cpp"
#include "SimpleVector.cpp"
```

Detailed Description

Implementation file for **QkSorter** using quick sort, derived from **SorterClass**.

Author:

Tanner Jones

Implements virtual member methods of the **QkSorter**

Version:

1.00 (30 September 2015)

Requires **QkSorter.h**, **SorterClass.cpp**, **SimpleVector.cpp**,

QkSorter.h File Reference

Definition file for **QkSorter** using a quick sort, derived from the **SorterClass**.

```
#include "DateType.h"
#include "SorterClass.h"
```

Classes

- class **QkSorter**

Detailed Description

Definition file for **QkSorter** using a quick sort, derived from the **SorterClass**.

Author:

Tanner Jones

Specifies all member methods of the **QkSorter** Class

Version:

1.00 (30 September 2015)

Requires **DateType.h**, **SorterClass.h**

SelSorter.cpp File Reference

Implementation file for **SelSorter** using insertion sort, derived from **SorterClass**.

```
#include "SelSorter.h"
#include "SorterClass.cpp"
#include "SimpleVector.cpp"
```

Detailed Description

Implementation file for **SelSorter** using insertion sort, derived from **SorterClass**.

Author:

Michael Leverington

Implements virtual member methods of the **SelSorter**

Version:

1.00 (11 September 2015)

Requires **SelSorter.h**, **SorterClass.cpp**, **SimpleVector.cpp**,

SelSorter.h File Reference

Definition file for **SelSorter** class using insertion sort, derived from **SorterClass**.

```
#include "DateType.h"
#include "SorterClass.h"
```

Classes

- class **SelSorter**

Detailed Description

Definition file for **SelSorter** class using insertion sort, derived from **SorterClass**.

Author:

Michael Leverington

Specifies all member methods of the **SelSorter** Class

Version:

1.00 (11 September 2015)

Requires **DateType.h**, **SorterClass.h**

SimpleTimer.cpp File Reference

Implementation file for **SimpleTimer** class.

```
#include "SimpleTimer.h"
```

Detailed Description

Implementation file for **SimpleTimer** class.

Author:

Michael Leverington

Implements member methods for timing

Version:

1.00 (11 September 2015)

Requires **SimpleTimer.h**.

SimpleTimer.h File Reference

Definition file for simple timer class.

```
#include <sys/time.h>
#include <cstring>
```

Classes

- class **SimpleTimer**

Detailed Description

Definition file for simple timer class.

Author:

Michael Leverington

Specifies all member methods of the **SimpleTimer**

Version:

1.00 (11 September 2015)

None

SimpleVector.cpp File Reference

Implementation file for **SimpleVector** class.

```
#include "SimpleVector.h"
```

Detailed Description

Implementation file for **SimpleVector** class.

Author:

Michael Leverington

Implements all member methods of the **SimpleVector** class

Version:

1.10 (11 September 2015) added getter and setter for date elements 1.00 (30 August 2015) origination

Requires **SimpleVector.h**

SimpleVector.h File Reference

Definition file for **SimpleVector** class.

```
#include <stdexcept>
```

Classes

- class **SimpleVector< DataType >**

Detailed Description

Definition file for **SimpleVector** class.

Author:

Michael Leverington

Specifies all member methods of the **SimpleVector** class

Version:

1.00 (11 September 2015)

None

SorterClass.cpp File Reference

Implementation file for **SorterClass**.

```
#include "SorterClass.h"
#include "SimpleVector.h"
```

Detailed Description

Implementation file for **SorterClass**.

Author:

Michael Leverington

Implements all member methods of the **SorterClass**

Version:

1.00 (11 September 2015)

Requires **SorterClass.h**, **SimpleVector.h**

SorterClass.h File Reference

Definition file for Sorter class.

```
#include "SimpleVector.h"
```

Classes

- class **SorterClass< DataType >**

Detailed Description

Definition file for Sorter class.

Author:

Michael Leverington

Specifies all member methods of the **SorterClass**

Version:

1.00 (11 September 2015)

Requires **SimpleVector.h**

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