Lab 13: Performance Evaluation

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Contents

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

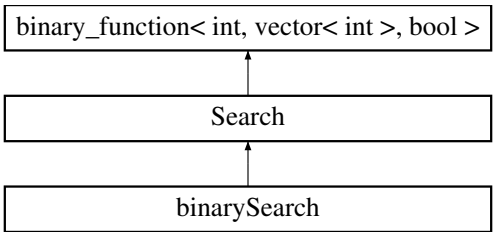
Here is a list of all files with brief descriptions:

Chapter 4

Class Documentation

4.1 binarySearch Class Reference

Inheritance diagram for binarySearch:



Public Member Functions

- bool operator() (int searchValue, const vector< int > &keys) const

4.1.1 Member Function Documentation

4.1.1.1 bool binarySearch::operator() (int *searchValue,* const vector< int > & *keys*) const [inline], [virtual]

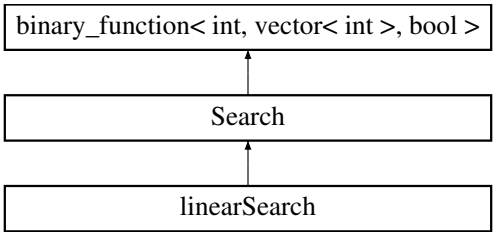
Implements Search.

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

- search.cpp

4.2 linearSearch Class Reference

Inheritance diagram for linearSearch:



Public Member Functions

- bool operator() (int searchValue, const vector< int > &keys) const

4.2.1 Member Function Documentation

4.2.1.1 bool linearSearch::operator() (int *searchValue,* const vector< int > & *keys*) const [inline], [virtual]

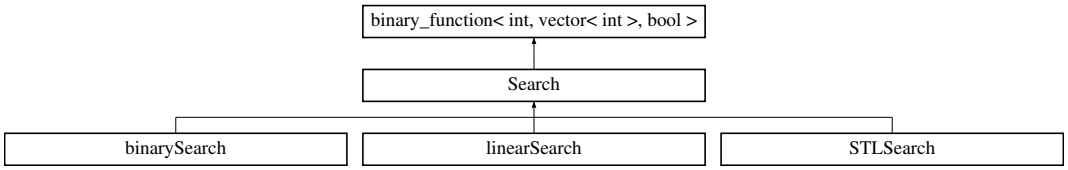
Implements Search.

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

- search.cpp

4.3 Search Class Reference

Inheritance diagram for Search:

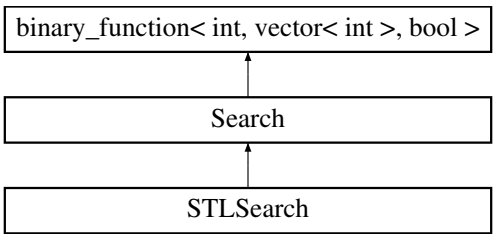


The documentation for this class was generated from the following file:

- search.cpp

4.4 STLSearch Class Reference

Inheritance diagram for STLSearch:



Public Member Functions

- bool operator() (int searchValue, const vector< int > &keys) const

4.4.1 Member Function Documentation

4.4.1.1 bool STLSearch::operator() (int *searchValue,* const vector< int > & *keys*) const [inline], [virtual]

Implements Search.

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

- search.cpp

4.5 TestVector Class Reference

`#include <testvector.h>`

Public Member Functions

- TestVector (int size)
- TestVector (const TestVector &rhs)
- TestVector & operator++ ()
- TestVector operator++ (int ignored)
- int operator[] (int loc) const

4.5.1 Constructor & Destructor Documentation

4.5.1.1 TestVector::TestVector (int *size*)

4.5.1.2 TestVector::TestVector (const TestVector & *rhs*)

4.5.2 Member Function Documentation

4.5.2.1 TestVector & TestVector::operator++ ( )

4.5.2.2 TestVector TestVector::operator++ (int *ignored*)

4.5.2.3 int TestVector::operator[] (int *loc*) const

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

- testvector.h
- testvector.cpp

4.6 Timer Class Reference

`#include <Timer.h>`

Public Member Functions

- Timer ()
- void start () throw (runtime_error)
- void stop () throw (logic_error)
- double getElapsedTime () const throw (logic_error)

4.6.1 Constructor & Destructor Documentation

4.6.1.1 Timer::Timer ( )

Precondition

Unitialized Timer Class

Postcondition

Duration assigned to -1 timerWasStarted assigned false

Algorithm:

- Assign data members values

Exceptional/Error Conditions:

- none

4.6.2 Member Function Documentation

4.6.2.1 double Timer::getElapsedTime ( ) const throw logic_error)

Parameters: none

Returns

The time in seconds as a double

Precondition

none

Postcondition

Duration set to the number of milliseconds passed since the start function was called

Algorithm:

- Get time of day assigned to the begin time
- Assign timerWasStarted true

Exceptions

logic_error	A logic error is thrown if the start function was never called or if the stop function was never called.

4.6.2.2 void Timer::start ( ) throw runtime_error)

Precondition

none

Postcondition

beginTime set to the timeval timerWasStarted assigned true

Algorithm:

- Get time of day assigned to the begin time
- Assign timerWasStarted true

Exceptional/Error Conditions:

- none

4.6.2.3 void Timer::stop ( ) throw logic_error)

Precondition

none

Postcondition

Duration set to the number of milliseconds passed since the start function was called

Algorithm:

- Get time of day assigned to the begin time
- Assign timerWasStarted true

Exceptions

A	logic error is thrown if the start function was never called.

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

- Timer.h
- Timer.cpp
- Timer.cs

Chapter 5

File Documentation

5.1 config.h File Reference

Macros

- #define LAB13_TEST1 0
- #define LAB13_TEST2 0

5.1.1 Macro Definition Documentation

5.1.1.1 #define LAB13_TEST1 0

Timer class (Lab 13) configuration file. Activate test 'N' by defining the corresponding LAB12_TESTN to have the value 1.

5.1.1.2 #define LAB13_TEST2 0

5.2 constructor.cpp File Reference

```
#include <iostream>
#include <string>
#include "Timer.h"
#include "TestVector.h"
```

Macros

- #define runTest(Type) testConstructor<Type>(numValues, #Type)

Functions

- template<typename DataType >
  int testCompute (DataType value)
- template<>
  int testCompute< int > (int value)
- template<>
  int testCompute< double > (double value)

- template<typename DataType >
  void testConstructor (int numValues, string name)
- int main (int argc, char **argv)

Variables

- const int numRepetitions = 1000000

5.2.1 Macro Definition Documentation

5.2.1.1 #define runTest(*Type*) testConstructor<Type>(numValues, #Type)

5.2.2 Function Documentation

5.2.2.1 int main (int *argc,* char ** *argv*)

5.2.2.2 template<typename DataType > int testCompute (DataType *value*)

5.2.2.3 template<> int testCompute< double > (double *value*)

5.2.2.4 template<> int testCompute< int > (int *value*)

5.2.2.5 template<typename DataType > void testConstructor (int *numValues,* string *name*)

5.2.3 Variable Documentation

5.2.3.1 const int numRepetitions = 1000000

5.3 inc.cpp File Reference

```
#include <iostream>
#include "Timer.h"
#include "TestVector.h"
```

Functions

- int main (int argc, char **argv)

Variables

- const int numRepetitions = 1000000

5.3.1 Function Documentation

5.3.1.1 int main (int *argc,* char ** *argv*)

5.3.2 Variable Documentation

5.3.2.1 const int numRepetitions = 1000000

5.4 search.cpp File Reference

```
#include <iostream>
#include <algorithm>
#include <vector>
#include "Timer.h"
```

Classes

- class Search
- class linearSearch
- class binarySearch
- class STLSearch

Functions

- int main (int argc, char **argv)

Variables

- const int numSearches = 100000

5.4.1 Function Documentation

5.4.1.1 int main (int *argc,* char ** *argv*)

5.4.2 Variable Documentation

5.4.2.1 const int numSearches = 100000

5.5 sort.cpp File Reference

```
#include <iostream>
#include <algorithm>
#include <vector>
#include "Timer.h"
```

Functions

- void selectionSort (vector< int >::iterator front, vector< int >::iterator back)
- void quickSort (vector< int >::iterator front, vector< int >::iterator back)
- void timeSort (void(*fcn)(vector< int >::iterator front, vector< int >::iterator back), const string name, const vector< int > &masterList, const Timer &overhead)
- int main (int argc, char **argv)

Variables

- const int numSorts = 100

5.5.1 Function Documentation

5.5.1.1 int main (int *argc,* char ** *argv*)

5.5.1.2 void quickSort (vector< int >::iterator *front,* vector< int >::iterator *back*)

5.5.1.3 void selectionSort (vector< int >::iterator *front,* vector< int >::iterator *back*)

5.5.1.4 void timeSort (void(*)(vector< int >::iterator front, vector< int >::iterator back) *fcn,* const string *name,* const vector< int > & *masterList,* const Timer & *overhead*)

5.5.2 Variable Documentation

5.5.2.1 const int numSorts = 100

5.6 test.cpp File Reference

```
#include <iostream>
#include <cctype>
#include <ctime>
```

Functions

- int main ()

5.6.1 Function Documentation

5.6.1.1 int main ( )

5.7 test13.cpp File Reference

```
#include <iostream>
#include <cctype>
#include <ctime>
#include "Timer.h"
```

Functions

- void wait (int secs)
- void print_help ()
- int main ()

5.7.1 Function Documentation

5.7.1.1 int main ( )

5.7.1.2 void print_help ( )

5.7.1.3 void wait (int *secs*)

5.8 testtimer.c++ File Reference

```
#include <iostream>
#include <cctype>
#include <ctime>
#include "Timer.h"
```

Functions

- int main ()

5.8.1 Function Documentation

5.8.1.1 int main ( )

5.9 testtimer.cc File Reference

```
#include <iostream>
#include <cctype>
#include <ctime>
#include "Timer.h"
```

Functions

- int main ()

5.9.1 Function Documentation

5.9.1.1 int main ( )

5.10 testtimer.cpp File Reference

```
#include <iostream>
#include <cctype>
#include <ctime>
#include <iomanip>
#include "Timer.h"
```

Functions

- int main ()

5.10.1 Function Documentation

5.10.1.1 int main ( )

5.11 testvector.cpp File Reference

```
#include <functional>
#include <algorithm>
#include "TestVector.h"
```

5.12 testvector.h File Reference

```
#include <stdexcept>
#include <iostream>
#include <vector>
```

Classes

- class TestVector

5.13 text.cc File Reference

```
#include <iostream>
#include <cctype>
#include <ctime>
```

Functions

- int main ()

5.13.1 Function Documentation

5.13.1.1 int main ( )

5.14 Timer.cpp File Reference

```
#include <iostream>
#include <sys/time.h>
#include <Timer.h>
```

Macros

- #define TIMER_CPP

Functions

- long long int toddiff (struct timeval *tod1, struct timeval *tod2)

5.14.1 Macro Definition Documentation

5.14.1.1 #define TIMER_CPP

5.14.2 Function Documentation

5.14.2.1 long long int toddiff (struct timeval * *tod1*, struct timeval * *tod2*)

Parameters

tod1	This is the initial timeval
tod2	This is the final timeval

Precondition

none

Postcondition

The difference between the intial and final time is returned.

Returns

Returns the difference between the intial and final time in usec.

Algorithm:

- Converts the timevals to be measured in usecs
- Returns the difference between the two times in usecs

Exceptional/Error Conditions:

- none

5.15 Timer.cs File Reference

```
#include "Timer.h"
```

Macros

- #define TIMER_CPP

5.15.1 Macro Definition Documentation

5.15.1.1 #define TIMER_CPP

5.16 Timer.h File Reference

```
#include <sys/time.h>
#include <stdexcept>
#include <iostream>
```

Classes

- class Timer

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