Project 4 - Laboratory 13 - Performance Evalution - Timer

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Contents

Chapter 1

Class 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

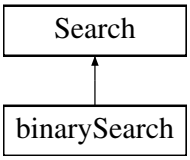
Here is a list of all files with brief descriptions:

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]

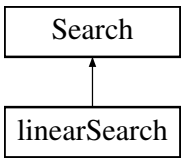
Implements Search.

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]

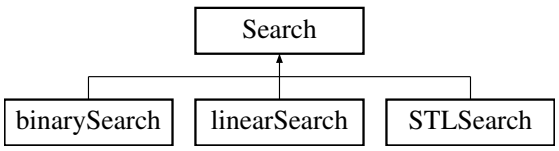
Implements Search.

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

- search.cpp

4.3 Search Class Reference

Inheritance diagram for Search:

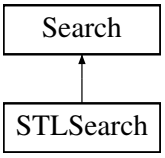


The documentation for this class was generated from the following file:

- 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 ( )

Default constructor.

Default constructor of timer class. Sets data members to zero and false.

4.6.2 Member Function Documentation

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

Returns elapsed time

Calculates elapsed time by converting microseconds to seconds. Returns this value. - Throws a logic error if the duration was never set because the timer had not been turned on.

Exceptions

Throws	logic error if duration not set.

throws a logic error if duration was never set

return the value of duration divided by 1000000 to give seconds instead of microseconds

4.6.2.2 void Timer::start ( ) throw (runtime_error)

Start timer.

Begins keeping track of the time passing, until stop. Throws an exception if timer could not start.

Exceptions

throws	error if timer did not start

gets the time of the day

throw runtime error if timer did not start

set that the timer has been started

4.6.2.3 void Timer::stop ( ) throw (logic_error)

Stops timer.

Stops timer incrementation and calculates durantion that timer counter was on.

Exceptions

throws	logic error if timer never started

if the timer hasn't been started, throw exception

instantiate time value holder variables

set the current time to the duration

gets the values of the microseconds

sets duration to difference of start and end times

sets that timer is not running anymore

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

- Timer.h
- Timer.cpp

Chapter 5

File Documentation

5.1 config.h File Reference

Defines

- #define LAB13_TEST1 0
- #define LAB13_TEST2 0

5.1.1 Define 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"
```

Defines

- #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 Define 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 test13.cpp File Reference

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

Functions

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

5.6.1 Function Documentation

5.6.1.1 int main ( )

5.6.1.2 void print_help ( )

5.6.1.3 void wait (int *secs*)

5.7 testtimer.cpp File Reference

```
#include "Timer.h" #include <iostream> #include <stddef.-
h> #include <sys/time.h> #include <cstdio>
```

Functions

- double getElapsed (timeval &t1)
- int main (int argc, char **argv)

5.7.1 Function Documentation

5.7.1.1 double getElapsed (timeval & *t1*)

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

5.8 testvector.cpp File Reference

```
#include <functional> #include <algorithm> #include "testvector.-
h"
```

5.9 testvector.h File Reference

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

Classes

- class TestVector

5.10 Timer.cpp File Reference

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

5.10.1 Detailed Description

Author

CatherinePollock

Date

9/16/14

This is the file that implements Timer.h and the Timer class within that file.

5.11 Timer.h File Reference

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

Classes

- class Timer