

MergeSort

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Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

[merge_sort< skladowe >](#)
Define the class holding the array and the workings of the MergeSort 5

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

main.cpp	7
mergesort.cpp	7
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pch.cpp	8
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Chapter 3

Class Documentation

3.1 merge_sort< skladowe > Class Template Reference

Define the class holding the array and the workings of the MergeSort.

```
#include <MergeSort.h>
```

Public Member Functions

- `merge_sort` (`vector< skladowe > x`)
Initiate the MergeSort.
- `void mergesort ()`
Return the sorted array.
- `vector< skladowe > ret ()`
Print the element on the screen.
- `void print ()`

3.1.1 Detailed Description

```
template<typename skladowe>
class merge_sort< skladowe >
```

Define the class holding the array and the workings of the MergeSort.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 merge_sort()

```
template<typename skladowe >
merge_sort< skladowe >::merge_sort (
    vector< skladowe > x) [inline]
```

3.1.3 Member Function Documentation

3.1.3.1 mergesort()

```
template<typename skladowe >
void merge_sort< skladowe >::mergesort ()
```

Initiate the MergeSort.

3.1.3.2 print()

```
template<typename skladowe >
void merge_sort< skladowe >::print ()
```

Print the element on the screen.

3.1.3.3 ret()

```
template<typename skladowe >
vector< skladowe > merge_sort< skladowe >::ret ()
```

Return the sorted array.

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

- [MergeSort.h](#)
- [mergesort.cpp](#)
- [print.cpp](#)
- [ret.cpp](#)

Chapter 4

File Documentation

4.1 main.cpp File Reference

```
#include "pch.h"
#include "mergesort.h"
```

Functions

- int `main ()`
The main body of the program, removing it shows more in-depth test results.

4.1.1 Function Documentation

4.1.1.1 `main()`

```
int main ()
```

The main body of the program, removing it shows more in-depth test results.

4.2 mergesort.cpp File Reference

```
#include "pch.h"
#include "mergesort.h"
```

4.3 MergeSort.h File Reference

```
#include <iostream>
#include <vector>
#include <algorithm>
```

Classes

- class `merge_sort<skladowe >`

Define the class holding the array and the workings of the MergeSort.

4.4 MergeSort.h

[Go to the documentation of this file.](#)

```

00001 #include <iostream>
00002 #include <vector>
00003 #include <algorithm>
00004
00005 using namespace std;
00006
00012 template <typename skladowe>
00013 class merge_sort {
00014 private:
00015     vector<skladowe> arr;
00016
00017     void dziel(vector<skladowe>& arr, int lewo, int prawo) {
00018         if (lewo >= prawo) return;
00019         int srodek = lewo + (prawo - lewo) / 2;
00020         dziel(arr, lewo, srodek);
00021         dziel(arr, srodek + 1, prawo);
00022         zwyczaj(arr, lewo, srodek, prawo);
00023     }
00024
00025     void zwyczaj(vector<skladowe>& arr, int lewo, int srodek, int prawo) {
00026         int n1 = srodek - lewo + 1;
00027         int n2 = prawo - srodek;
00028         vector<skladowe> L(n1), R(n2);
00029
00030         for (int i = 0; i < n1; i++)
00031             L[i] = arr[lewo + i];
00032         for (int j = 0; j < n2; j++)
00033             R[j] = arr[srodek + 1 + j];
00034
00035         int i = 0, j = 0;
00036         int k = lewo;
00037
00038         while (i < n1 && j < n2) {
00039             if (L[i] <= R[j]) {
00040                 arr[k] = L[i];
00041                 i++;
00042             }
00043             else {
00044                 arr[k] = R[j];
00045                 j++;
00046             }
00047             k++;
00048         }
00049         while (i < n1) {
00050             arr[k] = L[i];
00051             i++;
00052             k++;
00053         }
00054         while (j < n2) {
00055             arr[k] = R[j];
00056             j++;
00057             k++;
00058         }
00059     }
00060 public:
00061     merge_sort(vector<skladowe> x) : arr(x) {}
00062     void mergesort();
00063     vector<skladowe> ret();
00064     void print();
00065 };

```

4.5 pch.cpp File Reference

```
#include "pch.h"
```

4.6 pch.h File Reference

```
#include "gtest/gtest.h"
```

4.7 pch.h

Go to the documentation of this file.

```
00001 #pragma once
00002 #include "gtest/gtest.h"
```

4.8 print.cpp File Reference

```
#include "pch.h"
#include "mergesort.h"
```

4.9 ret.cpp File Reference

```
#include "pch.h"
#include "mergesort.h"
```

4.10 test.cpp File Reference

```
#include "pch.h"
#include "mergesort.h"
```

Functions

- **TEST** (TestCaseName, Test1)
Test1- keeps the array unchanged when it is already sorted in ascending order.
- **TEST** (TestCaseName, Test2)
Test2- can sort an array that is sorted in reverse order.
- **TEST** (TestCaseName, Test3)
Test3- correctly sorts a random array of numbers.
- **TEST** (TestCaseName, Test4)
Test4- correctly sorts arrays containing only negative numbers.
- **TEST** (TestCaseName, Test5)
Test5- correctly sorts arrays containing negative and positive numbers.
- **TEST** (TestCaseName, Test6)
Test6- handles empty arrays without throwing an exception.
- **TEST** (TestCaseName, Test7)

- **TEST** (TestCaseName, Test8)

Test7- does not change an array that contains only one element.
- **TEST** (TestCaseName, Test9)

Test8- correctly sorts an array containing duplicate numbers.
- **TEST** (TestCaseName, Test10)

Test9- correctly sorts a negative array with duplicates.
- **TEST** (TestCaseName, Test11)

Test10- correctly sorts arrays with negative numbers, positive numbers, and duplicates.
- **TEST** (TestCaseName, Test12)

Test11- correctly sorts an array containing only two elements in ascending order.
- **TEST** (TestCaseName, Test13)

Test12- correctly sorts a large array containing over 100 elements.
- **TEST** (TestCaseName, Test14)

Test13- correctly sorts a large array containing over 100 elements with negative numbers, positive numbers, and duplicates.
- **TEST** (TestCaseName, Test1)

Test14- correctly sorts an array containing chars.

4.10.1 Function Documentation

4.10.1.1 TEST() [1/14]

```
TEST (
    TestCaseName ,
    Test1 )
```

Test1- keeps the array unchanged when it is already sorted in ascending order.

4.10.1.2 TEST() [2/14]

```
TEST (
    TestCaseName ,
    Test10 )
```

Test10- correctly sorts arrays with negative numbers, positive numbers, and duplicates.

4.10.1.3 TEST() [3/14]

```
TEST (
    TestCaseName ,
    Test11 )
```

Test11- correctly sorts an array containing only two elements in ascending order.

4.10.1.4 TEST() [4/14]

```
TEST (
    TestCaseName ,
    Test12 )
```

Test12- correctly sorts a large array containing over 100 elements.

4.10.1.5 TEST() [5/14]

```
TEST (
    TestCaseName ,
    Test13 )
```

Test13- correctly sorts a large array containing over 100 elements with negative numbers, positive numbers, and duplicates.

4.10.1.6 TEST() [6/14]

```
TEST (
    TestCaseName ,
    Test14 )
```

Test14- correctly sorts an array containing chars.

4.10.1.7 TEST() [7/14]

```
TEST (
    TestCaseName ,
    Test2 )
```

Test2- can sort an array that is sorted in reverse order.

4.10.1.8 TEST() [8/14]

```
TEST (
    TestCaseName ,
    Test3 )
```

Test3- correctly sorts a random array of numbers.

4.10.1.9 TEST() [9/14]

```
TEST (
    TestCaseName ,
    Test4 )
```

Test4- correctly sorts arrays containing only negative numbers.

4.10.1.10 TEST() [10/14]

```
TEST (
    TestCaseName ,
    Test5 )
```

Test5- correctly sorts arrays containing negative and positive numbers.

4.10.1.11 TEST() [11/14]

```
TEST (
    TestCaseName ,
    Test6 )
```

Test6- handles empty arrays without throwing an exception.

4.10.1.12 TEST() [12/14]

```
TEST (
    TestCaseName ,
    Test7 )
```

Test7- does not change an array that contains only one element.

4.10.1.13 TEST() [13/14]

```
TEST (
    TestCaseName ,
    Test8 )
```

Test8- correctly sorts an array containing duplicate numbers.

4.10.1.14 TEST() [14/14]

```
TEST (
    TestCaseName ,
    Test9 )
```

Test9- correctly sorts a negative array with duplicates.

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