V3

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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:

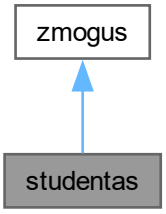
Chapter 4

Class Documentation

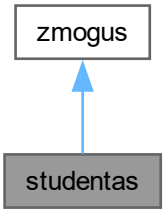
4.1 studentas Class Reference

`#include <studentai.h>`

Inheritance diagram for studentas:



Collaboration diagram for studentas:



Public Member Functions

- studentas ()
- studentas (const std::string &vardas, const std::string &pavarde, Vector< int > &ND, int EGZ)
- virtual std::string getVardas () const override
- virtual std::string getPavarde () const override
- ~studentas ()
- studentas (const studentas &other)
- studentas (studentas &&other) noexcept
- studentas & operator= (const studentas &other)
- studentas & operator= (studentas &&other) noexcept
- Vector< int > getND () const
- int getEGZ () const
- double getGalutinisV () const
- double getGalutinisM () const
- void setVardas (const std::string &newName)
- void setPavarde (const std::string &newSurname)
- void setND (Vector< int > &newND)
- void setEGZ (int newEGZ)
- void clearEverything ()

Public Member Functions inherited from zmogus

- zmogus ()
- zmogus (const std::string &vardas, const std::string &pavarde)
- ~zmogus ()

Friends

- std::istream & operator>> (std::istream &is, studentas &s)
- std::ostream & operator<< (std::ostream &os, const studentas &s)

Additional Inherited Members

Protected Attributes inherited from zmogus

- std::string vardas
- std::string pavarde

4.1.1 Constructor & Destructor Documentation

4.1.1.1 studentas() [1/4]

```
studentas::studentas ( )  [inline]
```

4.1.1.2 studentas() [2/4]

```
studentas::studentas (
            const std::string & vardas,
            const std::string & pavarde,
            Vector< int > & ND,
            int EGZ )  [inline]
```

4.1.1.3 ~studentas()

```
studentas::~studentas ( )  [inline]
```

4.1.1.4 studentas() [3/4]

```
studentas::studentas (
            const studentas & other )  [inline]
```

4.1.1.5 studentas() [4/4]

```
studentas::studentas (
            studentas && other )  [inline], [noexcept]
```

4.1.2 Member Function Documentation

4.1.2.1 clearEverything()

```
void studentas::clearEverything ( )  [inline]
```

4.1.2.2 getEGZ()

```
int studentas::getEGZ ( ) const  [inline]
```

4.1.2.3 getGalutinisM()

```
double studentas::getGalutinisM ( ) const  [inline]
```

4.1.2.4 getGalutinisV()

```
double studentas::getGalutinisV ( ) const  [inline]
```

4.1.2.5 getND()

```
Vector< int > studentas::getND ( ) const  [inline]
```

4.1.2.6 getPavarde()

```
virtual std::string studentas::getPavarde ( ) const  [inline], [override], [virtual]
```

Implements zmogus.

4.1.2.7 getVardas()

```
virtual std::string studentas::getVardas ( ) const  [inline], [override], [virtual]
```

Implements zmogus.

4.1.2.8 operator=() [1/2]

```
studentas & studentas::operator= (
            const studentas & other )  [inline]
```

4.1.2.9 operator=() [2/2]

```
studentas & studentas::operator= (
            studentas && other )  [inline], [noexcept]
```

4.1.2.10 setEGZ()

```
void studentas::setEGZ (
            int newEGZ )  [inline]
```

4.1.2.11 setND()

```
void studentas::setND (
            Vector< int > & newND )  [inline]
```

4.1.2.12 setPavarde()

```
void studentas::setPavarde (
            const std::string & newSurname )  [inline], [virtual]
```

Reimplemented from zmogus.

4.1.2.13 setVardas()

```
void studentas::setVardas (
            const std::string & newName )  [inline], [virtual]
```

Reimplemented from zmogus.

4.1.3 Friends And Related Symbol Documentation

4.1.3.1 operator<<

```
std::ostream & operator<< (
            std::ostream & os,
            const studentas & s )  [friend]
```

4.1.3.2 operator>>

```
std::istream & operator>> (
            std::istream & is,
            studentas & s )  [friend]
```

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

- studentai.h

4.2 Vector< T > Class Template Reference

```
#include <vector.h>
```

Public Types

- using value_type = T
- using iterator = T*
- using const_iterator = const T*
- using reference = T&
- using const_reference = const T&
- using size_type = std::size_t
- using difference_type = std::ptrdiff_t

Public Member Functions

- Vector ()
- Vector (size_type count)
- Vector (size_type count, const T &value)
- Vector (std::initializer_list< T > init)
- Vector (const Vector &other)
- Vector (Vector &&other) noexcept
- ~Vector ()
- Vector & operator= (const Vector &other)
- Vector & operator= (Vector &&other) noexcept
- Vector & operator= (std::initializer_list< T > init)
- reference at (size_type pos)
- const_reference at (size_type pos) const
- reference operator[ ] (size_type pos)
- const_reference operator[ ] (size_type pos) const

- reference front ()
- const_reference front () const
- reference back ()
- const_reference back () const
- T * data () noexcept
- const T * data () const noexcept
- iterator begin () noexcept
- const_iterator begin () const noexcept
- const_iterator cbegin () const noexcept
- iterator end () noexcept
- const_iterator end () const noexcept
- const_iterator cend () const noexcept
- bool empty () const noexcept
- size_type size () const noexcept
- size_type max_size () const noexcept
- void reserve (size_type new_cap)
- size_type capacity () const noexcept
- void shrink_to_fit ()
- void clear () noexcept
- void push_back (const T &value)
- void push_back (T &&value)
- void pop_back ()
- iterator insert (const_iterator pos, const T &value)
- iterator insert (const_iterator pos, T &&value)
- iterator erase (const_iterator pos)
- iterator erase (const_iterator first, const_iterator last)
- void resize (size_type count, T value=T())
- void swap (Vector &other) noexcept

4.2.1 Member Typedef Documentation

4.2.1.1 const_iterator

```
template<typename T >
using Vector< T >::const_iterator = const T*
```

4.2.1.2 const_reference

```
template<typename T >
using Vector< T >::const_reference = const T&
```

4.2.1.3 difference_type

```
template<typename T >
using Vector< T >::difference_type = std::ptrdiff_t
```

4.2.1.4 iterator

```
template<typename T >
using Vector< T >::iterator = T*
```

4.2.1.5 reference

```
template<typename T >
using Vector< T >::reference = T&
```

4.2.1.6 size_type

```
template<typename T >
using Vector< T >::size_type = std::size_t
```

4.2.1.7 value_type

```
template<typename T >
using Vector< T >::value_type = T
```

4.2.2 Constructor & Destructor Documentation

4.2.2.1 Vector() [1/6]

```
template<typename T >
Vector< T >::Vector ( )  [inline]
```

4.2.2.2 Vector() [2/6]

```
template<typename T >
Vector< T >::Vector (
            size_type count )  [inline], [explicit]
```

4.2.2.3 Vector() [3/6]

```
template<typename T >
Vector< T >::Vector (
            size_type count,
            const T & value )  [inline]
```

4.2.2.4 Vector() [4/6]

```
template<typename T >
Vector< T >::Vector (
            std::initializer_list< T > init )  [inline]
```

4.2.2.5 Vector() [5/6]

```
template<typename T >
Vector< T >::Vector (
            const Vector< T > & other )  [inline]
```

4.2.2.6 Vector() [6/6]

```
template<typename T >
Vector< T >::Vector (
            Vector< T > && other )  [inline], [noexcept]
```

4.2.2.7 ~Vector()

```
template<typename T >
Vector< T >::~Vector ( )  [inline]
```

4.2.3 Member Function Documentation

4.2.3.1 at() [1/2]

```
template<typename T >
reference Vector< T >::at (
            size_type pos )  [inline]
```

4.2.3.2 at() [2/2]

```
template<typename T >
const_reference Vector< T >::at (
            size_type pos ) const  [inline]
```

4.2.3.3 back() [1/2]

```
template<typename T >
reference Vector< T >::back ( )  [inline]
```

4.2.3.4 back() [2/2]

```
template<typename T >
const_reference Vector< T >::back ( ) const  [inline]
```

4.2.3.5 begin() [1/2]

```
template<typename T >
const_iterator Vector< T >::begin ( ) const  [inline], [noexcept]
```

4.2.3.6 begin() [2/2]

```
template<typename T >
iterator Vector< T >::begin ( )  [inline], [noexcept]
```

4.2.3.7 capacity()

```
template<typename T >
size_type Vector< T >::capacity ( ) const  [inline], [noexcept]
```

4.2.3.8 cbegin()

```
template<typename T >
const_iterator Vector< T >::cbegin ( ) const  [inline], [noexcept]
```

4.2.3.9 cend()

```
template<typename T >
const_iterator Vector< T >::cend ( ) const  [inline], [noexcept]
```

4.2.3.10 clear()

```
template<typename T >
void Vector< T >::clear ( )  [inline], [noexcept]
```

4.2.3.11 data() [1/2]

```
template<typename T >
const T * Vector< T >::data ( ) const  [inline], [noexcept]
```

4.2.3.12 data() [2/2]

```
template<typename T >
T * Vector< T >::data ( )  [inline], [noexcept]
```

4.2.3.13 empty()

```
template<typename T >
bool Vector< T >::empty ( ) const  [inline], [noexcept]
```

4.2.3.14 end() [1/2]

```
template<typename T >
const_iterator Vector< T >::end ( ) const  [inline], [noexcept]
```

4.2.3.15 end() [2/2]

```
template<typename T >
iterator Vector< T >::end ( )  [inline], [noexcept]
```

4.2.3.16 erase() [1/2]

```
template<typename T >
iterator Vector< T >::erase (
            const_iterator first,
            const_iterator last )  [inline]
```

4.2.3.17 erase() [2/2]

```
template<typename T >
iterator Vector< T >::erase (
            const_iterator pos )  [inline]
```

4.2.3.18 front() [1/2]

```
template<typename T >
reference Vector< T >::front ( )  [inline]
```

4.2.3.19 front() [2/2]

```
template<typename T >
const_reference Vector< T >::front ( ) const  [inline]
```

4.2.3.20 insert() [1/2]

```
template<typename T >
iterator Vector< T >::insert (
            const_iterator pos,
            const T & value )  [inline]
```

4.2.3.21 insert() [2/2]

```
template<typename T >
iterator Vector< T >::insert (
            const_iterator pos,
            T && value )  [inline]
```

4.2.3.22 max_size()

```
template<typename T >
size_type Vector< T >::max_size ( ) const  [inline], [noexcept]
```

4.2.3.23 operator=() [1/3]

```
template<typename T >
Vector & Vector< T >::operator= (
            const Vector< T > & other )  [inline]
```

4.2.3.24 operator=() [2/3]

```
template<typename T >
Vector & Vector< T >::operator= (
            std::initializer_list< T > init )  [inline]
```

4.2.3.25 operator=() [3/3]

```
template<typename T >
Vector & Vector< T >::operator= (
            Vector< T > && other )  [inline], [noexcept]
```

4.2.3.26 operator[]() [1/2]

```
template<typename T >
reference Vector< T >::operator[] (
            size_type pos )  [inline]
```

4.2.3.27 operator[]() [2/2]

```
template<typename T >
const_reference Vector< T >::operator[] (
            size_type pos ) const  [inline]
```

4.2.3.28 pop_back()

```
template<typename T >
void Vector< T >::pop_back ( )  [inline]
```

4.2.3.29 push_back() [1/2]

```
template<typename T >
void Vector< T >::push_back (
            const T & value )  [inline]
```

4.2.3.30 push_back() [2/2]

```
template<typename T >
void Vector< T >::push_back (
            T && value )  [inline]
```

4.2.3.31 reserve()

```
template<typename T >
void Vector< T >::reserve (
            size_type new_cap )  [inline]
```

4.2.3.32 resize()

```
template<typename T >
void Vector< T >::resize (
            size_type count,
            T value = T() )  [inline]
```

4.2.3.33 shrink_to_fit()

```
template<typename T >
void Vector< T >::shrink_to_fit ( )  [inline]
```

4.2.3.34 size()

```
template<typename T >
size_type Vector< T >::size ( ) const  [inline], [noexcept]
```

4.2.3.35 swap()

```
template<typename T >
void Vector< T >::swap (
            Vector< T > & other )  [inline], [noexcept]
```

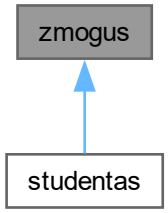
The documentation for this class was generated from the following file:

- vector.h

4.3 zmogus Class Reference

```
#include <studentai.h>
```

Inheritance diagram for zmogus:



Public Member Functions

- zmogus ()
- zmogus (const std::string &vardas, const std::string &pavarde)
- ~zmogus ()
- virtual std::string getVardas () const =0
- virtual std::string getPavarde () const =0
- virtual void setVardas (const std::string &newName)
- virtual void setPavarde (const std::string &newSurname)

Protected Attributes

- std::string vardas
- std::string pavarde

4.3.1 Constructor & Destructor Documentation

4.3.1.1 zmogus() [1/2]

```
zmogus::zmogus ( )  [inline]
```

4.3.1.2 zmogus() [2/2]

```
zmogus::zmogus (
            const std::string & vardas,
            const std::string & pavarde )  [inline]
```

4.3.1.3 ~zmogus()

```
zmogus::~zmogus ( )  [inline]
```

4.3.2 Member Function Documentation

4.3.2.1 getPavarde()

```
virtual std::string zmogus::getPavarde ( ) const  [pure virtual]
```

Implemented in studentas.

4.3.2.2 getVardas()

```
virtual std::string zmogus::getVardas ( ) const  [pure virtual]
```

Implemented in studentas.

4.3.2.3 setPavarde()

```
virtual void zmogus::setPavarde (
            const std::string & newSurname )  [inline], [virtual]
```

Reimplemented in studentas.

4.3.2.4 setVardas()

```
virtual void zmogus::setVardas (
            const std::string & newName )  [inline], [virtual]
```

Reimplemented in studentas.

4.3.3 Member Data Documentation

4.3.3.1 pavarde

```
std::string zmogus::pavarde  [protected]
```

4.3.3.2 vardas

```
std::string zmogus::vardas  [protected]
```

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

- studentai.h

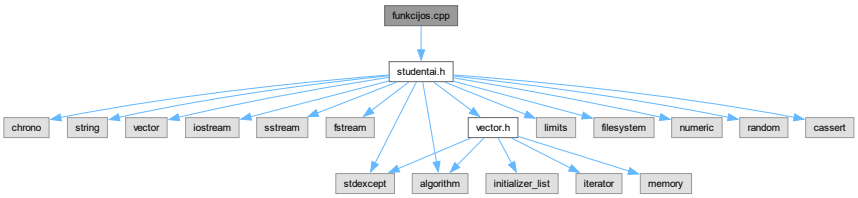
Chapter 5

File Documentation

5.1 funkcijos.cpp File Reference

```
#include "studentai.h"
```

Include dependency graph for funkcijos.cpp:



Functions

- void Netinkamas_Ivestis (std::string Problema)
- std::mt19937 generuoti (rd())
- std::uniform_int_distribution< int > nd_kiekis (5, 20)
- std::uniform_int_distribution< int > dis (1, 10)
- std::uniform_int_distribution< int > dis_lytis (0, 1)
- void GeneruotiNDPazymius (studentas &S, int ND_kiekis)
- void GeneruotiVardus (studentas &S)
- void GeneruotiFailus (int reserveDydis, std::string &G_Failo_Vieta)
- void Ivesti_Pazymius (studentas &S)
- void Ivesti_Varda (studentas &S)
- std::vector< studentas > Nuskaityti_Is_Failo (const std::string &Failo_Pavadinimas, int reserveDydis)
- void Rikiuoti_Duomenis (std::vector< studentas > &S)
- void Skirstyti_Studentus (std::vector< studentas > &S, std::vector< studentas > &N, std::vector< studentas > &G, int Strategija)
- void Spausdinti_Rezultatus (const std::vector< studentas > &N, const std::vector< studentas > &G)

Variables

- std::random_device rd
- std::vector< std::string > vardaiV = { "Jonas", "Petras", "Antanas", "Juozas", "Kazys", "Darius", "Linas", "Tomas", "Giedrius", "Marius" }
- std::vector< std::string > vardaiM = { "Ona", "Maryte", "Aldona", "Gabija", "Dalia", "Danute", "Asta", "Rasa", "Nijole", "Aiste", "Gabriele" }
- std::vector< std::string > pavardesV = { "Jonaitis", "Petraitis", "Antanaitis", "Juozaitis", "Kaziukaitis", "Dariukaitis", "Linaitis", "Tomaitis", "Giedraitis", "Mariukaitis" }
- std::vector< std::string > pavardesM = { "Jonaite", "Petraityte", "Antanaite", "Juozaite", "Kaziukaite", "Dariukaite", "Linaite", "Tomaite", "Giedraite", "Mariukaite", "Antaniene", "Jonaitiene", "Antaniene" }
- int lytis = dis_lytis(generuoti)

5.1.1 Function Documentation

5.1.1.1 dis()

```
std::uniform_int_distribution< int > dis (
            1 ,
            10  )
```

5.1.1.2 dis_lytis()

```
std::uniform_int_distribution< int > dis_lytis (
            0 ,
            1  )
```

5.1.1.3 generuoti()

```
std::mt19937 generuoti (
            rd()  )
```

5.1.1.4 GeneruotiFailus()

```
void GeneruotiFailus (
            int reserveDydis,
            std::string & G_Failo_Vieta )
```

5.1.1.5 GeneruotiNDPazymius()

```
void GeneruotiNDPazymius (
            studentas & S,
            int ND_kiekis )
```

5.1.1.6 GeneruotiVardus()

```
void GeneruotiVardus (
            studentas & S )
```

5.1.1.7 Ivesti_Pazymius()

```
void Ivesti_Pazymius (
            studentas & S )
```

5.1.1.8 Ivesti_Varda()

```
void Ivesti_Varda (
            studentas & S )
```

5.1.1.9 nd_kiekis()

```
std::uniform_int_distribution< int > nd_kiekis (
            5 ,
            20  )
```

5.1.1.10 Netinkamas_Ivestis()

```
void Netinkamas_Ivestis (
            std::string Problema )
```

5.1.1.11 Nuskaityti_Is_Failo()

```
std::vector< studentas > Nuskaityti_Is_Failo (
            const std::string & Failo_Pavadinimas,
            int reserveDydis )
```

5.1.1.12 Rikiuoti_Duomenis()

```
void Rikiuoti_Duomenis (
            std::vector< studentas > & S )
```

5.1.1.13 Skirstyti_Studentus()

```
void Skirstyti_Studentus (
            std::vector< studentas > & S,
            std::vector< studentas > & N,
            std::vector< studentas > & G,
            int Strategija )
```

5.1.1.14 Spausdinti_Rezultatus()

```
void Spausdinti_Rezultatus (
            const std::vector< studentas > & N,
            const std::vector< studentas > & G )
```

5.1.2 Variable Documentation

5.1.2.1 lytis

```
int lytis = dis_lytis(generuoti)
```

5.1.2.2 pavardesM

```
std::vector<std::string> pavardesM = { "Jonaite", "Petraityte", "Antanaite", "Juozaite",
"Kaziukaite", "Dariukaite", "Linaite", "Tomaite", "Giedraite", "Mariukaite", "Antaniene",
"Jonaitiene", "Antaniene" }
```

5.1.2.3 pavardesV

```
std::vector<std::string> pavardesV = { "Jonaitis", "Petraitis", "Antanaitis", "Juozaitis",
"Kaziukaitis", "Dariukaitis", "Linaitis", "Tomaitis", "Giedraitis", "Mariukaitis" }
```

5.1.2.4 rd

```
std::random_device rd
```

5.1.2.5 vardaiM

```
std::vector<std::string> vardaiM = { "Ona", "Maryte", "Aldona", "Gabija", "Dalia", "Danute",
"Asta", "Rasa", "Nijole", "Aiste", "Gabriele" }
```

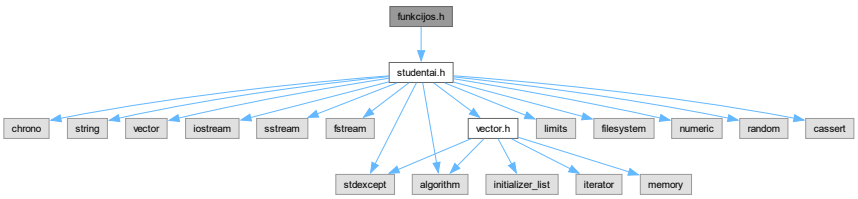
5.1.2.6 vardaiV

```
std::vector<std::string> vardaiV = { "Jonas", "Petras", "Antanas", "Juozas", "Kazys", "Darius",
"Linas", "Tomas", "Giedrius", "Marius" }
```

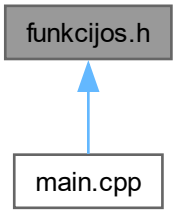
5.2 funkcijos.h File Reference

```
#include "studentai.h"
```

Include dependency graph for funkcijos.h:



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



Functions

- void Netinkamas_Ivestis (std::string Problema)
- void GeneruotiNDPazymius (studentas &S, int ND_kiekis)
- void GeneruotiVardus (studentas &S)
- void GeneruotiFailus (int reserveDydis, std::string &failoPav)
- void Ivesti_Pazymius (studentas &S)
- void Ivesti_Varda (studentas &S)
- std::vector< studentas > Nuskaityti_Is_Failo (const std::string &Failo_Pavadinimas, int reserveDydis)
- bool VarduRikiavimas (const studentas &a, const studentas &b)
- bool PavardziuRikiavimas (const studentas &a, const studentas &b)
- bool MedianuRikiavimas (const studentas &a, const studentas &b)
- bool VidurkiuRikiavimas (const studentas &a, const studentas &b)
- void Rikiuoti_Duomenis (std::vector< studentas > &S)
- void Skirstyti_Studentus (std::vector< studentas > &S, std::vector< studentas > &N, std::vector< studentas > &G, int Strategija)
- void Spausdinti_Rezultatus (const std::vector< studentas > &N, const std::vector< studentas > &G)

5.2.1 Function Documentation

5.2.1.1 GeneruotiFailus()

```
void GeneruotiFailus (
            int reserveDydis,
            std::string & failoPav )
```

5.2.1.2 GeneruotiNDPazymius()

```
void GeneruotiNDPazymius (
            studentas & S,
            int ND_kiekis )
```

5.2.1.3 GeneruotiVardus()

```
void GeneruotiVardus (
            studentas & S )
```

5.2.1.4 Ivesti_Pazymius()

```
void Ivesti_Pazymius (
            studentas & S )
```

5.2.1.5 Ivesti_Varda()

```
void Ivesti_Varda (
            studentas & S )
```

5.2.1.6 MedianuRikiavimas()

```
bool MedianuRikiavimas (
            const studentas & a,
            const studentas & b )
```

5.2.1.7 Netinkamas_Ivestis()

```
void Netinkamas_Ivestis (
            std::string Problema )
```

5.2.1.8 Nuskaityti_Is_Failo()

```
std::vector< studentas > Nuskaityti_Is_Failo (
            const std::string & Failo_Pavadinimas,
            int reserveDydis )
```

5.2.1.9 PavardziuRikiavimas()

```
bool PavardziuRikiavimas (
            const studentas & a,
            const studentas & b )
```

5.2.1.10 Rikiuoti_Duomenis()

```
void Rikiuoti_Duomenis (
            std::vector< studentas > & S )
```

5.2.1.11 Skirstyti_Studentus()

```
void Skirstyti_Studentus (
            std::vector< studentas > & S,
            std::vector< studentas > & N,
            std::vector< studentas > & G,
            int Strategija )
```

5.2.1.12 Spausdinti_Rezultatus()

```
void Spausdinti_Rezultatus (
            const std::vector< studentas > & N,
            const std::vector< studentas > & G )
```

5.2.1.13 VarduRikiavimas()

```
bool VarduRikiavimas (
            const studentas & a,
            const studentas & b )
```

5.2.1.14 VidurkiuRikiavimas()

```
bool VidurkiuRikiavimas (
            const studentas & a,
            const studentas & b )
```

5.3 funkcijos.h

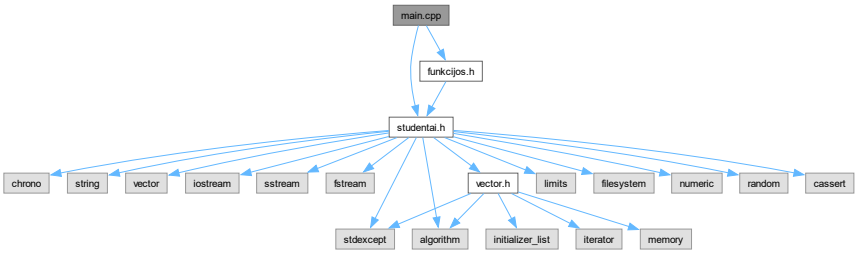
Go to the documentation of this file.

```
00001 #ifndef FUNKCIJOS_H
00002 #define FUNKCIJOS_H
00003 #include "studentai.h"
00004
00006 void Netinkamas_Ivestis(std::string Problema);
00007
00009 void GeneruotiNDPazymius(studentas& S, int ND_kiekis);
00010 void GeneruotiVardus(studentas& S);
00011 void GeneruotiFailus(int reserveDydis, std::string& failoPav);
00012
00014 void Ivesti_Pazymius(studentas& S);
00015 void Ivesti_Varda(studentas& S);
00016
00018 std::vector<studentas> Nuskaityti_Is_Failo(const std::string& Failo_Pavadinimas, int reserveDydis);
00019
00021 bool VarduRikiavimas(const studentas& a, const studentas& b);
00022 bool PavardziuRikiavimas(const studentas& a, const studentas& b);
00023 bool MedianuRikiavimas(const studentas& a, const studentas& b);
00024 bool VidurkiuRikiavimas(const studentas& a, const studentas& b);
00025 void Rikiuoti_Duomenis(std::vector<studentas>& S);
00026
00028 void Skirstyti_Studentus(std::vector<studentas>& S, std::vector<studentas>& N, std::vector<studentas>&
      G, int Strategija);
00029
00031 void Spausdinti_Rezultatus(const std::vector<studentas>& N, const std::vector<studentas>& G);
00032
00033 #endif
```

5.4 main.cpp File Reference

```
#include "studentai.h"
#include "funkcijos.h"
```

Include dependency graph for main.cpp:



Functions

- int main ()

Variables

- char TaipNe

5.4.1 Function Documentation

5.4.1.1 main()

```
int main ( )
```

5.4.2 Variable Documentation

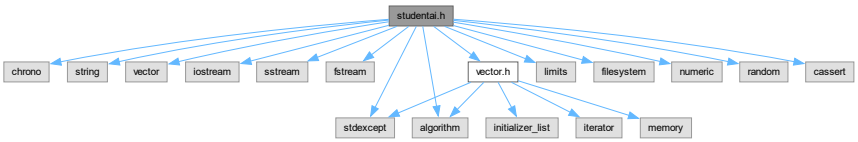
5.4.2.1 TaipNe

```
char TaipNe
```

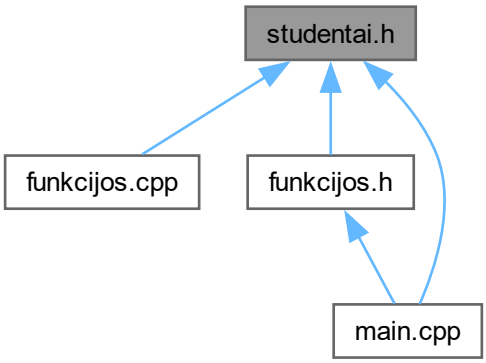
5.5 studentai.h File Reference

```
#include <chrono>
#include <string>
#include <vector>
#include <iostream>
#include <sstream>
#include <fstream>
#include <stdexcept>
#include <limits>
#include <filesystem>
#include <algorithm>
#include <numeric>
#include <random>
#include <cassert>
#include "vector.h"
```

Include dependency graph for studentai.h:



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



Classes

- class zmogus
- class studentas

5.6 studentai.h

Go to the documentation of this file.

```
00001 #ifndef STUDENTAI_H
00002 #define STUDENTAI_H
00003
00004 #include <chrono>
00005 #include <string>
00006 #include <vector>
00007 #include <iostream>
00008 #include <sstream>
00009 #include <fstream>
00010 #include <stdexcept>
00011 #include <limits>
00012 #include <filesystem>
00013 #include <algorithm>
00014 #include <numeric>
00015 #include <random>
00016 #include <cassert>
00017 #include "vector.h"
00018
00019 //ZMOGUS
00020 class zmogus {
00021 protected:
00022     std::string vardas;
00023     std::string pavarde;
00024 public:
00025     //Konstruktorius
00026     zmogus() : vardas("Bevardis"), pavarde("Bepavardis") { /* std::cout << "Suveike zmogus default
      konstruktorius\n"; */ }
00027     zmogus(const std::string& vardas, const std::string& pavarde)
00028         : vardas(vardas), pavarde(pavarde) {}
00029
00030     ~zmogus() {}
00031
00032     virtual std::string getVardas() const = 0;
00033     virtual std::string getPavarde() const = 0;
00034
00035     // Setter'iai
00036     virtual void setVardas(const std::string& newName) { vardas = newName; }
00037     virtual void setPavarde(const std::string& newSurname) { pavarde = newSurname; }
00038
00039 };
00040
00041 //STUDENTAS
00042 class  studentas : public zmogus {
00043 private:
00044
00045     Vector<int>ND;
00046     int EGZ;
00047     double GalutinisV;
00048     double GalutinisM;
00049     void ApskaiciuotiGalutinius()
00050     {
00051         if (!ND.empty())
00052         {
00053             GalutinisV = 0.4 * std::accumulate(ND.begin(), ND.end(), 0.0) / ND.size() + 0.6 * EGZ;
00054             if (ND.size() > 1)
00055             {
00056                 Vector<int> sortedND = ND;
00057                 std::sort(sortedND.begin(), sortedND.end());
00058                 size_t mid = sortedND.size() / 2;
00059                 GalutinisM = 0.4 * (sortedND.size() % 2 == 0 ? (sortedND[mid - 1] + sortedND[mid]) /
      2.0 : sortedND[mid]) + 0.6 * EGZ;
00060             }
00061             else
00062                 GalutinisM = 0.4 * ND[0] + 0.6 * EGZ;
00063         }
00064         else
00065         {
00066             // Jei ND tuščias
00067             GalutinisV = GalutinisM = 0.6 * EGZ;
00068         }
00069     }
00070
00071 public:
00072     studentas() : EGZ(0), ND(), GalutinisV(0), GalutinisM(0) {
00073         //std::cout << "Suveike studentas default konstruktorius\n";
00074     }
00075
00076     studentas(const std::string& vardas, const std::string& pavarde, Vector<int>& ND, int EGZ)
00077         : zmogus(vardas, pavarde), ND(ND), EGZ(EGZ) {
00078         ApskaiciuotiGalutinius();
00079         //std::cout << "Suveike parametrizuotas konstruktorius\n";
00080     }
```

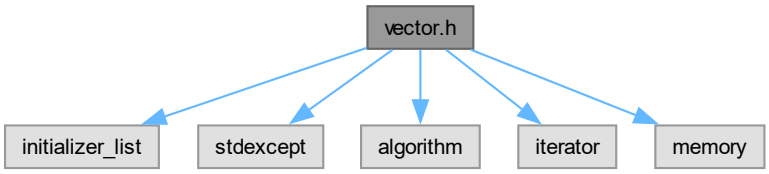
```
00081
00082     // Implementuojame abstrakčius metodus
00083     virtual std::string getVardas() const override {
00084         return vardas;
00085     }
00086
00087     virtual std::string getPavarde() const override {
00088         return pavarde;
00089     }
00090     // Destruktorius
00091     ~studentas() { ND.clear();  /*std::cout « "Suveike destruktorius\n";*/ }
00092
00093     // Copy konstruktorius
00094     studentas(const studentas& other)
00095     {
00096         vardas = other.vardas;
00097         pavarde = other.pavarde;
00098         ND = other.ND;
00099         EGZ = other.EGZ;
00100         GalutinisV = other.GalutinisV;
00101         GalutinisM = other.GalutinisM;
00102         //std::cout « "Suveike copy konstruktorius\n";
00103     }
00104     // Move konstruktorius
00105     studentas(studentas&& other) noexcept
00106     {
00107         vardas = std::move(other.vardas);
00108         pavarde = std::move(other.pavarde);
00109         ND = std::move(other.ND);
00110         EGZ = std::move(other.EGZ);
00111         GalutinisV = std::move(other.GalutinisV);
00112         GalutinisM = std::move(other.GalutinisM);
00113         other.clearEverything();
00114         //std::cout « "Suveike move konstruktorius\n";
00115     }
00116     // Copy priskyrimo operatorius
00117     studentas& operator=(const studentas& other)
00118     {
00119
00120         if (this != &other)
00121         {
00122             vardas = other.vardas;
00123             pavarde = other.pavarde;
00124             ND = other.ND;
00125             EGZ = other.EGZ;
00126             GalutinisV = other.GalutinisV;
00127             GalutinisM = other.GalutinisM;
00128             //std::cout « "Suveike copy priskyrimo operatorius\n";
00129         }
00130         return *this;
00131     }
00132     // Move priskyrimo operatorius
00133     studentas& operator=(studentas&& other) noexcept
00134     {
00135
00136         if (this != &other)
00137         {
00138             vardas = std::move(other.vardas);
00139             pavarde = std::move(other.pavarde);
00140             ND = std::move(other.ND);
00141             EGZ = std::move(other.EGZ);
00142             GalutinisV = std::move(other.GalutinisV);
00143             GalutinisM = std::move(other.GalutinisM);
00144             other.clearEverything();
00145             //std::cout « "Suveike move priskyrimo operatorius\n";
00146         }
00147         return *this;
00148     }
00149
00150     // Getter'iai
00151     Vector<int> getND() const { return ND; }
00152     int getEGZ() const { return EGZ; }
00153     double getGalutinisV() const { return GalutinisV; }
00154     double getGalutinisM() const { return GalutinisM; }
00155
00156     // Setter'iai
00157     void setVardas(const std::string& newName) { vardas = newName; }
00158     void setPavarde(const std::string& newSurname) { pavarde = newSurname; }
00159     void setND(Vector<int>& newND) { ND = newND; ApskaiciuotiGalutinius(); }
00160     void setEGZ(int newEGZ) {
00161         EGZ = newEGZ;
00162         ApskaiciuotiGalutinius();
00163     }
00164
00165     friend std::istream& operator»(std::istream& is, studentas& s)
00166     {
00167         s.vardas.clear();
```

```
00168         s.pavarde.clear();
00169         s.ND.clear();
00170         s.EGZ = 0;
00171 
00172 
00173         if (!(is » s.vardas » s.pavarde))
00174         {
00175             return is;
00176         }
00177 
00178         int pazymys;
00179         Vector<int> NDpazymiai;
00180         while (is » pazymys)
00181         {
00182             NDpazymiai.push_back(pazymys);
00183         }
00184 
00185         // Patikrina, ar pasiekė failo pabaigą
00186         if (is.eof()) {
00187             is.clear();
00188         }
00189         // Jei įvedimo operacija nepavyko
00190         else if (is.fail()) {
00191 
00192             is.clear();
00193             std::string unused;
00194             std::getline(is, unused);
00195             return is;
00196         }
00197 
00198         if (!NDpazymiai.empty())
00199         {
00200             s.EGZ = NDpazymiai.back();
00201             NDpazymiai.pop_back();
00202             s.ND = NDpazymiai;
00203         }
00204 
00205         s.ApskaiciuotiGalutinius();
00206         //std::cout « "Suveike ivesties operatorius\n";
00207         return is;
00208     }
00209 
00210     friend std::ostream& operator«(std::ostream& os, const studentas& s)
00211     {
00212         os « std::setw(20) « s.pavarde « std::setw(20) « s.vardas « std::setw(20) «
      std::setprecision(3) « s.GalutinisV « std::setw(20) « std::setprecision(3) « s.GalutinisM « std::endl;
00213         //std::cout « "Suveike isvesties operatorius\n";
00214         return os;
00215 
00216     }
00217 
00218     void clearEverything()
00219     {
00220         this->vardas.clear();
00221         this->pavarde.clear();
00222         this->ND.clear();
00223         this->EGZ = 0;
00224         this->GalutinisV = 0;
00225         this->GalutinisM = 0;
00226     }
00227 };
00228 #endif
```

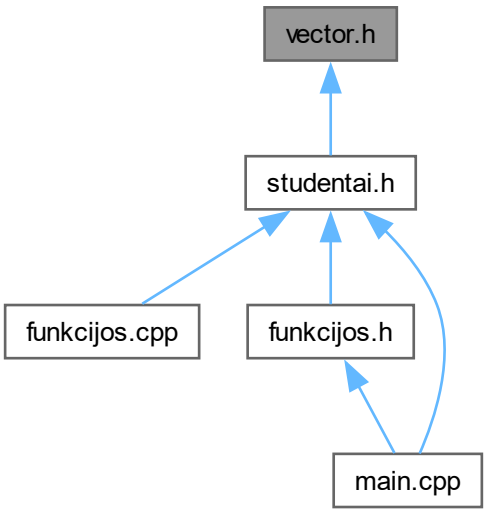
5.7 vector.h File Reference

```
#include <initializer_list>
#include <stdexcept>
#include <algorithm>
#include <iterator>
#include <memory>
```

Include dependency graph for vector.h:



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



Classes

- class Vector< T >

Functions

- template<typename T >
  bool operator== (const Vector< T > &lhs, const Vector< T > &rhs)
- template<typename T >
  bool operator!= (const Vector< T > &lhs, const Vector< T > &rhs)
- template<typename T >
  bool operator< (const Vector< T > &lhs, const Vector< T > &rhs)
- template<typename T >
  bool operator<= (const Vector< T > &lhs, const Vector< T > &rhs)

- template<typename T >
  bool operator> (const Vector< T > &lhs, const Vector< T > &rhs)
- template<typename T >
  bool operator>= (const Vector< T > &lhs, const Vector< T > &rhs)
- template<typename T >
  void swap (Vector< T > &lhs, Vector< T > &rhs) noexcept

5.7.1 Function Documentation

5.7.1.1 operator"!=()

```
template<typename T >
bool operator!= (
            const Vector< T > & lhs,
            const Vector< T > & rhs )
```

5.7.1.2 operator<()

```
template<typename T >
bool operator< (
            const Vector< T > & lhs,
            const Vector< T > & rhs )
```

5.7.1.3 operator<=()

```
template<typename T >
bool operator<= (
            const Vector< T > & lhs,
            const Vector< T > & rhs )
```

5.7.1.4 operator==()

```
template<typename T >
bool operator== (
            const Vector< T > & lhs,
            const Vector< T > & rhs )
```

5.7.1.5 operator>()

```
template<typename T >
bool operator> (
            const Vector< T > & lhs,
            const Vector< T > & rhs )
```

5.7.1.6 operator>=()

```
template<typename T >
bool operator>= (
            const Vector< T > & lhs,
            const Vector< T > & rhs )
```

5.7.1.7 swap()

```
template<typename T >
void swap (
            Vector< T > & lhs,
            Vector< T > & rhs )  [noexcept]
```

5.8 vector.h

Go to the documentation of this file.

```
00001 #ifndef VECTOR_H
00002 #define VECTOR_H
00003
00004 #include <initializer_list>
00005 #include <stdexcept>
00006 #include <algorithm>
00007 #include <iterator>
00008 #include <memory>
00009
00010 template <typename T>
00011 class Vector {
00012 public:
00013     // Member types
00014     using value_type = T;
00015     using iterator = T*;
00016     using const_iterator = const T*;
00017     using reference = T&;
00018     using const_reference = const T&;
00019     using size_type = std::size_t;
00020     using difference_type = std::ptrdiff_t;
00021
00022     // Constructors
00023     Vector() : data_(nullptr), size_(0), capacity_(0) {}
00024
00025     explicit Vector(size_type count) {
00026         data_ = new T[count]();
00027         size_ = count;
00028         capacity_ = count;
00029     }
00030
00031     Vector(size_type count, const T& value) {
00032         data_ = new T[count];
00033         size_ = count;
00034         capacity_ = count;
00035         std::fill_n(data_, count, value);
00036     }
00037
00038     Vector(std::initializer_list<T> init) : Vector(init.size()) {
00039         std::copy(init.begin(), init.end(), data_);
00040     }
00041
00042     Vector(const Vector& other) : Vector(other.size_) {
00043         std::copy(other.data_, other.data_ + other.size_, data_);
00044     }
00045
00046     Vector(Vector&& other) noexcept : data_(other.data_), size_(other.size_),
      capacity_(other.capacity_) {
00047         other.data_ = nullptr;
00048         other.size_ = 0;
00049         other.capacity_ = 0;
00050     }
00051
00052     // Destructor
00053     ~Vector() {
00054         delete[] data_;
00055     }
00056
00057     // Assignment operators
00058     Vector& operator=(const Vector& other) {
00059         if (this != &other) {
00060             Vector temp(other);
00061             swap(temp);
00062         }
00063         return *this;
00064     }
00065
00066     Vector& operator=(Vector&& other) noexcept {
00067         if (this != &other) {
```

```
00068             delete[] data_;
00069             data_ = other.data_;
00070             size_ = other.size_;
00071             capacity_ = other.capacity_;
00072             other.data_ = nullptr;
00073             other.size_ = 0;
00074             other.capacity_ = 0;
00075         }
00076         return *this;
00077     }
00078
00079     Vector& operator=(std::initializer_list<T> init) {
00080         Vector temp(init);
00081         swap(temp);
00082         return *this;
00083     }
00084
00085     // Element access
00086     reference at(size_type pos) {
00087         if (pos >= size_) throw std::out_of_range("Vector::at");
00088         return data_[pos];
00089     }
00090
00091     const_reference at(size_type pos) const {
00092         if (pos >= size_) throw std::out_of_range("Vector::at");
00093         return data_[pos];
00094     }
00095
00096     reference operator[](size_type pos) {
00097         return data_[pos];
00098     }
00099
00100     const_reference operator[](size_type pos) const {
00101         return data_[pos];
00102     }
00103
00104     reference front() {
00105         return data_[0];
00106     }
00107
00108     const_reference front() const {
00109         return data_[0];
00110     }
00111
00112     reference back() {
00113         return data_[size_ - 1];
00114     }
00115
00116     const_reference back() const {
00117         return data_[size_ - 1];
00118     }
00119
00120     T* data() noexcept {
00121         return data_;
00122     }
00123
00124     const T* data() const noexcept {
00125         return data_;
00126     }
00127
00128     // Iterators
00129     iterator begin() noexcept {
00130         return data_;
00131     }
00132
00133     const_iterator begin() const noexcept {
00134         return data_;
00135     }
00136
00137     const_iterator cbegin() const noexcept {
00138         return data_;
00139     }
00140
00141     iterator end() noexcept {
00142         return data_ + size_;
00143     }
00144
00145     const_iterator end() const noexcept {
00146         return data_ + size_;
00147     }
00148
00149     const_iterator cend() const noexcept {
00150         return data_ + size_;
00151     }
00152
00153     // Capacity
00154     bool empty() const noexcept {
```

```
00155         return size_ == 0;
00156     }
00157
00158     size_type size() const noexcept {
00159         return size_;
00160     }
00161
00162     size_type max_size() const noexcept {
00163         return std::numeric_limits<size_type>::max();
00164     }
00165
00166     void reserve(size_type new_cap) {
00167         if (new_cap > capacity_) {
00168             T* new_data = new T[new_cap];
00169             std::copy(data_, data_ + size_, new_data);
00170             delete[] data_;
00171             data_ = new_data;
00172             capacity_ = new_cap;
00173         }
00174     }
00175
00176     size_type capacity() const noexcept {
00177         return capacity_;
00178     }
00179
00180     void shrink_to_fit() {
00181         if (capacity_ > size_) {
00182             T* new_data = new T[size_];
00183             std::copy(data_, data_ + size_, new_data);
00184             delete[] data_;
00185             data_ = new_data;
00186             capacity_ = size_;
00187         }
00188     }
00189
00190     // Modifiers
00191     void clear() noexcept {
00192         size_ = 0;
00193     }
00194
00195     void push_back(const T& value) {
00196         if (size_ == capacity_) reserve(capacity_ > 0 ? 2 * capacity_ : 1);
00197         data_[size_++] = value;
00198     }
00199
00200     void push_back(T&& value) {
00201         if (size_ == capacity_) reserve(capacity_ > 0 ? 2 * capacity_ : 1);
00202         data_[size_++] = std::move(value);
00203     }
00204
00205     void pop_back() {
00206         if (size_ > 0) --size_;
00207     }
00208
00209     iterator insert(const_iterator pos, const T& value) {
00210         size_type index = pos - data_;
00211         if (size_ == capacity_) reserve(capacity_ > 0 ? 2 * capacity_ : 1);
00212         for (size_type i = size_; i > index; --i) {
00213             data_[i] = data_[i - 1];
00214         }
00215         data_[index] = value;
00216         ++size_;
00217         return data_ + index;
00218     }
00219
00220     iterator insert(const_iterator pos, T&& value) {
00221         size_type index = pos - data_;
00222         if (size_ == capacity_) reserve(capacity_ > 0 ? 2 * capacity_ : 1);
00223         for (size_type i = size_; i > index; --i) {
00224             data_[i] = data_[i - 1];
00225         }
00226         data_[index] = std::move(value);
00227         ++size_;
00228         return data_ + index;
00229     }
00230
00231     iterator erase(const_iterator pos) {
00232         size_type index = pos - data_;
00233         for (size_type i = index; i < size_ - 1; ++i) {
00234             data_[i] = std::move(data_[i + 1]);
00235         }
00236         --size_;
00237         return data_ + index;
00238     }
00239
00240     iterator erase(const_iterator first, const_iterator last) {
00241         size_type start_index = first - data_;
```

```
00242         size_type end_index = last - data_;
00243         size_type count = end_index - start_index;
00244         for (size_type i = start_index; i < size_ - count; ++i) {
00245             data_[i] = std::move(data_[i + count]);
00246         }
00247         size_ -= count;
00248         return data_ + start_index;
00249     }
00250 
00251     void resize(size_type count, T value = T()) {
00252         if (count > size_) {
00253             reserve(count);
00254             std::fill(data_ + size_, data_ + count, value);
00255         }
00256         size_ = count;
00257     }
00258 
00259     void swap(Vector& other) noexcept {
00260         std::swap(data_, other.data_);
00261         std::swap(size_, other.size_);
00262         std::swap(capacity_, other.capacity_);
00263     }
00264 
00265 private:
00266     T* data_;
00267     size_type size_;
00268     size_type capacity_;
00269 };
00270 
00271 // Non-member functions
00272 template <typename T>
00273 bool operator==(const Vector<T>& lhs, const Vector<T>& rhs) {
00274     return lhs.size() == rhs.size() && std::equal(lhs.begin(), lhs.end(), rhs.begin());
00275 }
00276 
00277 template <typename T>
00278 bool operator!=(const Vector<T>& lhs, const Vector<T>& rhs) {
00279     return !(lhs == rhs);
00280 }
00281 
00282 template <typename T>
00283 bool operator<(const Vector<T>& lhs, const Vector<T>& rhs) {
00284     return std::lexicographical_compare(lhs.begin(), lhs.end(), rhs.begin(), rhs.end());
00285 }
00286 
00287 template <typename T>
00288 bool operator<=(const Vector<T>& lhs, const Vector<T>& rhs) {
00289     return !(rhs < lhs);
00290 }
00291 
00292 template <typename T>
00293 bool operator>(const Vector<T>& lhs, const Vector<T>& rhs) {
00294     return rhs < lhs;
00295 }
00296 
00297 template <typename T>
00298 bool operator>=(const Vector<T>& lhs, const Vector<T>& rhs) {
00299     return !(lhs < rhs);
00300 }
00301 
00302 template <typename T>
00303 void swap(Vector<T>& lhs, Vector<T>& rhs) noexcept {
00304     lhs.swap(rhs);
00305 }
00306 
00307 #endif
```

Index