

Quadratic Sieve

Generated by Doxygen 1.8.6

Wed Mar 2 2016 02:39:12

Contents

1	Namespace Index	1
1.1	Namespace List	1
2	Hierarchical Index	3
2.1	Class Hierarchy	3
3	Class Index	5
3.1	Class List	5
4	File Index	7
4.1	File List	7
5	Namespace Documentation	9
5.1	QS Namespace Reference	9
5.1.1	Enumeration Type Documentation	9
5.1.1.1	legendre_value	9
5.2	QS::numeric Namespace Reference	9
6	Class Documentation	11
6.1	Factor_base Class Reference	11
6.1.1	Detailed Description	11
6.2	QS::QSAbstract_factor_base Class Reference	11
6.2.1	Constructor & Destructor Documentation	11
6.2.1.1	QSAbstract_factor_base	11
6.2.1.2	QSAbstract_factor_base	11
6.2.1.3	QSAbstract_factor_base	11
6.2.2	Member Function Documentation	11
6.2.2.1	operator[]	11
6.3	QS::numeric::QSAbstract_matrix< T > Class Template Reference	12
6.3.1	Member Function Documentation	12
6.3.1.1	get_elem	12
6.3.1.2	put_elem	12
6.3.1.3	sum_row	13

6.3.2	Member Data Documentation	13
6.3.2.1	col_number	13
6.3.2.2	row_number	13
6.4	QS::numeric::QSAbstract_vector< T > Class Template Reference	13
6.4.1	Member Function Documentation	14
6.4.1.1	operator[]	14
6.4.1.2	operator[]	14
6.4.1.3	resize	14
6.4.1.4	size	14
6.5	QS::QSFactor_base Class Reference	14
6.5.1	Constructor & Destructor Documentation	14
6.5.1.1	QSFactor_base	14
6.5.1.2	QSFactor_base	14
6.5.1.3	QSFactor_base	14
6.5.2	Member Function Documentation	14
6.5.2.1	operator[]	14
6.6	QS::numeric::QSMatrix< T > Class Template Reference	15
6.6.1	Constructor & Destructor Documentation	15
6.6.1.1	QSMatrix	15
6.6.1.2	QSMatrix	15
6.6.2	Member Function Documentation	15
6.6.2.1	get_col	15
6.6.2.2	get_elem	15
6.6.2.3	get_row	15
6.6.2.4	put_elem	15
6.6.2.5	sum_row	16
6.7	QS::numeric::QSVector< T > Class Template Reference	16
6.7.1	Constructor & Destructor Documentation	17
6.7.1.1	QSVector	17
6.7.1.2	QSVector	17
6.7.1.3	QSVector	17
6.7.2	Member Function Documentation	17
6.7.2.1	calc_lft_1_bit	17
6.7.2.2	calc_wt	17
6.7.2.3	get_elem	17
6.7.2.4	operator+	17
6.7.2.5	operator[]	17
6.7.2.6	operator[]	17
6.7.2.7	resize	17
6.7.2.8	resize	17

6.7.2.9	set_elem	17
6.7.2.10	size	17
6.7.2.11	sum_row	17
7	File Documentation	19
7.1	include/factor_base.h File Reference	19
7.2	include/matrix.h File Reference	19
7.3	include/vector.h File Reference	20
7.4	include/virtual/abstract_factor_base.h File Reference	20
7.5	include/virtual/abstract_matrix.h File Reference	20
7.6	include/virtual/abstract_vector.h File Reference	20
7.7	src/factor_base.cpp File Reference	21
7.8	src/main.cpp File Reference	21
7.8.1	Function Documentation	21
7.8.1.1	main	21
7.9	src/matrix.cpp File Reference	21
7.10	src/test.cpp File Reference	21
7.10.1	Function Documentation	21
7.10.1.1	main	21
	Index	22

Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

QS	9
QS::numeric	9

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Factor_base	11
QS::QSAbstract_factor_base	11
QS::numeric::QSAbstract_matrix< T >	12
QS::numeric::QSMatrix< T >	15
QS::numeric::QSAbstract_vector< T >	13
QS::numeric::QSVector< T >	16
QS::QSFactor_base	14

Chapter 3

Class Index

3.1 Class List

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

Factor_base	11
QS::QSAbstract_factor_base	11
QS::numeric::QSAbstract_matrix< T >	12
QS::numeric::QSAbstract_vector< T >	13
QS::QSFactor_base	14
QS::numeric::QSMatrix< T >	15
QS::numeric::QSVector< T >	16

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

include/ factor_base.h	19
include/ matrix.h	19
include/ vector.h	20
include/virtual/ abstract_factor_base.h	20
include/virtual/ abstract_matrix.h	20
include/virtual/ abstract_vector.h	20
src/ factor_base.cpp	21
src/ main.cpp	21
src/ matrix.cpp	21
src/ test.cpp	21

Chapter 5

Namespace Documentation

5.1 QS Namespace Reference

Namespaces

- [numeric](#)

Classes

- class [QSFactor_base](#)
- class [QSAbstract_factor_base](#)

Enumerations

- enum [legendre_value](#) { [IS_NOT_QUADRATIC_RESIDUE](#) }

5.1.1 Enumeration Type Documentation

5.1.1.1 enum QS::legendre_value

Enumerator

IS_NOT_QUADRATIC_RESIDUE

5.2 QS::numeric Namespace Reference

Classes

- class [QSMatrix](#)
- class [QSVector](#)
- class [QSAbstract_matrix](#)
- class [QSAbstract_vector](#)

Chapter 6

Class Documentation

6.1 Factor_base Class Reference

```
#include <factor_base.h>
```

6.1.1 Detailed Description

This class implements a factor base for algorithm of Quadratic Sieve. Factor base is a vector containing those primes number which have legendre number with $N = 1$, where N is the semiprime number we're going to factorize

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

- include/[factor_base.h](#)

6.2 QS::QSAbstract_factor_base Class Reference

```
#include <abstract_factor_base.h>
```

Public Member Functions

- [QSAbstract_factor_base](#) ()=delete
- [QSAbstract_factor_base](#) (mpz N)
- [QSAbstract_factor_base](#) (mpz N , long unsigned *upper_bound*)
- unsigned long [operator\[\]](#) (unsigned int i) const

6.2.1 Constructor & Destructor Documentation

6.2.1.1 QS::QSAbstract_factor_base::QSAbstract_factor_base () [delete]

6.2.1.2 QS::QSAbstract_factor_base::QSAbstract_factor_base (mpz N) [explicit]

6.2.1.3 QS::QSAbstract_factor_base::QSAbstract_factor_base (mpz N , long unsigned *upper_bound*)

6.2.2 Member Function Documentation

6.2.2.1 unsigned long QS::QSAbstract_factor_base::operator[] (unsigned int i) const

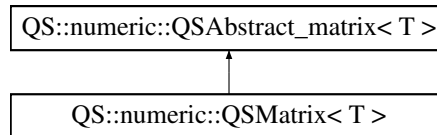
The documentation for this class was generated from the following file:

- include/virtual/[abstract_factor_base.h](#)

6.3 QS::numeric::QAbstract_matrix< T > Class Template Reference

```
#include <abstract_matrix.h>
```

Inheritance diagram for QS::numeric::QAbstract_matrix< T >:



Public Member Functions

- virtual [QS::numeric::QSVector< T >](#) [sum_row](#) (unsigned i, unsigned j) const =0
sum two row src and dst and put result in dst
- virtual T [get_elem](#) (unsigned i, unsigned j)=0
return element in position i,j
- virtual void [put_elem](#) (unsigned i, unsigned j, T elem)=0
set the element in position i,j

Protected Attributes

- unsigned [row_number](#)
number of rows
- unsigned [col_number](#)
number of columns

6.3.1 Member Function Documentation

6.3.1.1 `template<class T> virtual T QS::numeric::QAbstract_matrix< T >::get_elem (unsigned i, unsigned j)`
[pure virtual]

return element in position i,j

Parameters

<i>i</i>	row indes
<i>j</i>	column index

Implemented in [QS::numeric::QMatrix< T >](#).

6.3.1.2 `template<class T> virtual void QS::numeric::QAbstract_matrix< T >::put_elem (unsigned i, unsigned j, T elem)` [pure virtual]

set the element in position i,j

Parameters

<i>i</i>	row index
<i>j</i>	column index
<i>elem</i>	element to set

Implemented in [QS::numeric::QSMatrix< T >](#).

6.3.1.3 `template<class T> virtual QS::numeric::QSVector<T> QS::numeric::QAbstract_matrix< T >::sum_row (unsigned i, unsigned j) const` [pure virtual]

sum two row src and dst and put result in dest

Parameters

<i>src</i>	first row
<i>dst</i>	second row

Implemented in [QS::numeric::QSMatrix< T >](#).

6.3.2 Member Data Documentation

6.3.2.1 `template<class T> unsigned QS::numeric::QAbstract_matrix< T >::col_number` [protected]

number of columns

6.3.2.2 `template<class T> unsigned QS::numeric::QAbstract_matrix< T >::row_number` [protected]

number of rows

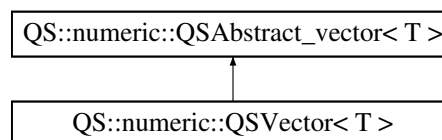
The documentation for this class was generated from the following file:

- [include/virtual/abstract_matrix.h](#)

6.4 QS::numeric::QAbstract_vector< T > Class Template Reference

```
#include <abstract_vector.h>
```

Inheritance diagram for QS::numeric::QAbstract_vector< T >:



Public Member Functions

- virtual void [resize](#) (unsigned dim)=0
- virtual unsigned [size](#) ()=0
- const T [operator\[\]](#) (unsigned i) const
- T & [operator\[\]](#) (unsigned i)

6.4.1 Member Function Documentation

6.4.1.1 `template<class T> const T QS::numeric::QAbstract_vector< T>::operator[] (unsigned i) const`

6.4.1.2 `template<class T> T& QS::numeric::QAbstract_vector< T>::operator[] (unsigned i)`

6.4.1.3 `template<class T> virtual void QS::numeric::QAbstract_vector< T>::resize (unsigned dim) [pure virtual]`

Implemented in [QS::numeric::QVector< T >](#).

6.4.1.4 `template<class T> virtual unsigned QS::numeric::QAbstract_vector< T>::size () [pure virtual]`

Implemented in [QS::numeric::QVector< T >](#).

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

- [include/virtual/abstract_vector.h](#)

6.5 QS::QSFactor_base Class Reference

```
#include <factor_base.h>
```

Public Member Functions

- [QSFactor_base](#) ()=delete
Factor_base constructor without elements has no sense. it needs at least a Number N.
- [QSFactor_base](#) (mpz N)
- [QSFactor_base](#) (mpz_N, long unsigned upper_bound)
- unsigned long [operator\[\]](#) (unsigned int i) const

6.5.1 Constructor & Destructor Documentation

6.5.1.1 `QS::QSFactor_base::QSFactor_base () [delete]`

[Factor_base](#) constructor without elements has no sense. it needs at least a Number N.

6.5.1.2 `QS::QSFactor_base::QSFactor_base (mpz N) [explicit]`

6.5.1.3 `QS::QSFactor_base::QSFactor_base (mpz_N , long unsigned upper_bound)`

6.5.2 Member Function Documentation

6.5.2.1 `unsigned long QS::QSFactor_base::operator[] (unsigned int i) const`

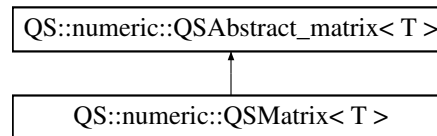
The documentation for this class was generated from the following file:

- [include/factor_base.h](#)

6.6 QS::numeric::QSMatrix< T > Class Template Reference

```
#include <matrix.h>
```

Inheritance diagram for QS::numeric::QSMatrix< T >:



Public Member Functions

- [QSMatrix](#) (unsigned i, unsigned j)
- [QSMatrix](#) (unsigned i, unsigned j, const T initial_value)
- T [get_elem](#) (unsigned i, unsigned j)
return element in position i,j
- void [put_elem](#) (unsigned i, unsigned j, const T elem)
set the element in position i,j
- unsigned [get_row](#) ()
- unsigned [get_col](#) ()
- [QS::numeric::QSVector](#)< T > [sum_row](#) (unsigned i, unsigned j) const
sum two row src and dst and put result in dest

Additional Inherited Members

6.6.1 Constructor & Destructor Documentation

6.6.1.1 `template<class T> QS::numeric::QSMatrix< T >::QSMatrix (unsigned i, unsigned j)`

6.6.1.2 `template<class T> QS::numeric::QSMatrix< T >::QSMatrix (unsigned i, unsigned j, const T initial_value)`

6.6.2 Member Function Documentation

6.6.2.1 `template<class T> unsigned QS::numeric::QSMatrix< T >::get_col () [inline]`

6.6.2.2 `template<class T> T QS::numeric::QSMatrix< T >::get_elem (unsigned i, unsigned j) [virtual]`

return element in position i,j

Parameters

<i>i</i>	row indes
<i>j</i>	column index

Implements [QS::numeric::QAbstract_matrix< T >](#).

6.6.2.3 `template<class T> unsigned QS::numeric::QSMatrix< T >::get_row () [inline]`

6.6.2.4 `template<class T> void QS::numeric::QSMatrix< T >::put_elem (unsigned i, unsigned j, const T elem) [virtual]`

set the element in position i,j

Parameters

<i>i</i>	row index
<i>j</i>	column index
<i>elem</i>	element to set

Implements [QS::numeric::QSAbstract_matrix< T >](#).

6.6.2.5 `template<class T> QS::numeric::Vector< T > QS::numeric::QSMatrix< T >::sum_row (unsigned i, unsigned j) const` [virtual]

sum two row src and dst and put result in dest

Parameters

<i>src</i>	first row
<i>dst</i>	second row

Implements [QS::numeric::QSAbstract_matrix< T >](#).

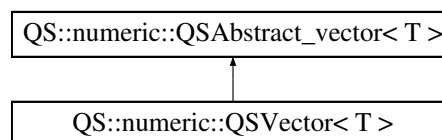
The documentation for this class was generated from the following file:

- [include/matrix.h](#)

6.7 QS::numeric::QSVector< T > Class Template Reference

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

Inheritance diagram for QS::numeric::QSVector< T >:



Public Member Functions

- [QSVector](#) ()
- [QSVector](#) (unsigned dim)
- [QSVector](#) (unsigned dim, const T &initial_value)
- unsigned [size](#) ()
- void [resize](#) (unsigned s)
- void [resize](#) (unsigned s, T initial_value)
- T & [get_elem](#) (unsigned i)
- void [set_elem](#) (unsigned i, T elem)
- T & [operator\[\]](#) (unsigned i)
- const T & [operator\[\]](#) (unsigned i) const
- [QSVector< T >](#) [operator+](#) (const [QSVector< T >](#) &v) const
- [QSVector](#) [sum_row](#) ([QSVector< T >](#) v1, [QSVector< T >](#) v2)
- void [calc_wt](#) ()
- void [calc_lft_1_bit](#) ()

6.7.1 Constructor & Destructor Documentation

6.7.1.1 `template<class T> QS::numeric::QSVector< T >::QSVector ()`

6.7.1.2 `template<class T> QS::numeric::QSVector< T >::QSVector (unsigned dim)`

6.7.1.3 `template<class T> QS::numeric::QSVector< T >::QSVector (unsigned dim, const T & initial_value)`

6.7.2 Member Function Documentation

6.7.2.1 `template<class T> void QS::numeric::QSVector< T >::calc_lft_1_bit ()`

6.7.2.2 `template<class T> void QS::numeric::QSVector< T >::calc_wt ()`

6.7.2.3 `template<class T> T & QS::numeric::QSVector< T >::get_elem (unsigned i)`

6.7.2.4 `template<class T> QSVector<T> QS::numeric::QSVector< T >::operator+ (const QSVector< T > & v)
const`

6.7.2.5 `template<class T> T & QS::numeric::QSVector< T >::operator[] (unsigned i)`

6.7.2.6 `template<class T> const T & QS::numeric::QSVector< T >::operator[] (unsigned i) const`

6.7.2.7 `template<class T> void QS::numeric::QSVector< T >::resize (unsigned s) [virtual]`

Implements [QS::numeric::QSAbstract_vector< T >](#).

6.7.2.8 `template<class T> void QS::numeric::QSVector< T >::resize (unsigned s, T initial_value)`

6.7.2.9 `template<class T> void QS::numeric::QSVector< T >::set_elem (unsigned i, T elem)`

6.7.2.10 `template<class T> unsigned QS::numeric::QSVector< T >::size () [virtual]`

Implements [QS::numeric::QSAbstract_vector< T >](#).

6.7.2.11 `template<class T> QSVector QS::numeric::QSVector< T >::sum_row (QSVector< T > v1, QSVector< T > v2)`

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

- [include/vector.h](#)

Chapter 7

File Documentation

7.1 `include/factor_base.h` File Reference

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

Classes

- class [QS::QSFactor_base](#)

Namespaces

- [QS](#)

Enumerations

- enum [QS::legendre_value](#) { [QS::IS_NOT_QUADRATIC_RESIDUE](#) }

7.2 `include/matrix.h` File Reference

```
#include "../virtual/abstract_matrix.h"
#include "../virtual/abstract_vector.h"
#include "template/matrix.templates.h"
```

Classes

- class [QS::numeric::QSMatrix< T >](#)

Namespaces

- [QS](#)
- [QS::numeric](#)

7.3 include/vector.h File Reference

```
#include "../virtual/abstract_vector.h"  
#include <iostream>  
#include <vector>  
#include "template/vector.templates.h"
```

Classes

- class [QS::numeric::QSVector< T >](#)

Namespaces

- [QS](#)
- [QS::numeric](#)

7.4 include/virtual/abstract_factor_base.h File Reference

```
#include <gmp>
```

Classes

- class [QS::QSAbstract_factor_base](#)

Namespaces

- [QS](#)

7.5 include/virtual/abstract_matrix.h File Reference

Classes

- class [QS::numeric::QSAbstract_matrix< T >](#)

Namespaces

- [QS](#)
- [QS::numeric](#)

7.6 include/virtual/abstract_vector.h File Reference

Classes

- class [QS::numeric::QSAbstract_vector< T >](#)

Namespaces

- [QS](#)
- [QS::numeric](#)

7.7 src/factor_base.cpp File Reference

7.8 src/main.cpp File Reference

```
#include <iostream>
#include <gmp>
```

Functions

- int [main](#) ()

7.8.1 Function Documentation

7.8.1.1 int main ()

7.9 src/matrix.cpp File Reference

7.10 src/test.cpp File Reference

```
#include <iostream>
#include "../include/vector.h"
#include "../include/matrix.h"
```

Functions

- int [main](#) ()

7.10.1 Function Documentation

7.10.1.1 int main ()

Index

calc_lft_1_bit
 QS::numeric::QSVector, 17

calc_wt
 QS::numeric::QSVector, 17

col_number
 QS::numeric::QSAbstract_matrix, 13

Factor_base, 11

get_col
 QS::numeric::QSMatrix, 15

get_elem
 QS::numeric::QSAbstract_matrix, 12
 QS::numeric::QSMatrix, 15
 QS::numeric::QSVector, 17

get_row
 QS::numeric::QSMatrix, 15

IS_NOT_QUADRATIC_RESIDUE
 QS, 9

include/factor_base.h, 19

include/matrix.h, 19

include/vector.h, 20

include/virtual/abstract_factor_base.h, 20

include/virtual/abstract_matrix.h, 20

include/virtual/abstract_vector.h, 20

legendre_value
 QS, 9

main
 main.cpp, 21
 test.cpp, 21

main.cpp
 main, 21

operator+
 QS::numeric::QSVector, 17

put_elem
 QS::numeric::QSAbstract_matrix, 12
 QS::numeric::QSMatrix, 15

QS
 IS_NOT_QUADRATIC_RESIDUE, 9

QS, 9
 legendre_value, 9

QS::QSAbstract_factor_base, 11
 QSAbstract_factor_base, 11

QS::QSFactor_base, 14
 QSFactor_base, 14

QSMatrix
 QS::numeric::QSMatrix, 15

QSVector
 QS::numeric::QSVector, 17

resize
 QS::numeric::QSAbstract_vector, 14
 QS::numeric::QSVector, 17

row_number
 QS::numeric::QSAbstract_matrix, 13

set_elem
 QS::numeric::QSVector, 17

size
 QS::numeric::QSAbstract_vector, 14

QS::numeric, 9

QS::numeric::QSAbstract_matrix
 col_number, 13
 get_elem, 12
 put_elem, 12
 row_number, 13
 sum_row, 13

QS::numeric::QSAbstract_matrix< T >, 12

QS::numeric::QSAbstract_vector
 resize, 14
 size, 14

QS::numeric::QSAbstract_vector< T >, 13

QS::numeric::QSMatrix
 get_col, 15
 get_elem, 15
 get_row, 15
 put_elem, 15
 QSMatrix, 15
 sum_row, 16

QS::numeric::QSMatrix< T >, 15

QS::numeric::QSVector
 calc_lft_1_bit, 17
 calc_wt, 17
 get_elem, 17
 operator+, 17
 QSVector, 17
 resize, 17
 set_elem, 17
 size, 17
 sum_row, 17

QS::numeric::QSVector< T >, 16

QSAbstract_factor_base
 QS::QSAbstract_factor_base, 11

QSFactor_base
 QS::QSFactor_base, 14

QSMatrix
 QS::numeric::QSMatrix, 15

QSVector
 QS::numeric::QSVector, 17

resize
 QS::numeric::QSAbstract_vector, 14
 QS::numeric::QSVector, 17

row_number
 QS::numeric::QSAbstract_matrix, 13

set_elem
 QS::numeric::QSVector, 17

size
 QS::numeric::QSAbstract_vector, 14

- QS::numeric::QSVector, [17](#)
- src/factor_base.cpp, [21](#)
- src/main.cpp, [21](#)
- src/matrix.cpp, [21](#)
- src/test.cpp, [21](#)
- sum_row
 - QS::numeric::QSAbstract_matrix, [13](#)
 - QS::numeric::QSMatrix, [16](#)
 - QS::numeric::QSVector, [17](#)
- test.cpp
 - main, [21](#)