MathProject

1.2

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Chapter 1

File Index

1.1 File List

Here is a list of all files with brief descriptions:

Chapter 2

File Documentation

2.1 /home/tako/programming/HWHW/0_SqEq/include/SqEq.hh File Reference

Macros

- #define SQEQ_ERROR 1

  return this from main on error
- #define MAX_ROOT_NUM 2

  maximal munber of roots
- #define COEFF_NUM 3

  number of coefficients
- #define EPS 1e-12

  epsilon

Enumerations

- enum ResType {
  RT_ERROR, RT_INV_COEFF_ERROR, RT_NULLPTR_ERROR, RT_VALID,
  RT_NO_ROOTS, RT_ONE_ROOT, RT_TWO_ROOTS, RT_INF_ROOTS }

  enum with result types of solve functions

Functions

- bool read_coeffs (const char *prompt, double coeffs[COEFF_NUM])

  Reading 3 coefficients from stdin.
- void print_res (int res_type, const double results[MAX_ROOT_NUM])

  Print squaree equations roots.
- int solve_sqeq (const double coeffs[COEFF_NUM], double results[MAX_ROOT_NUM])

  Solving square equation.
- int solve_linear (double b, double c, double *x_ptr)

  Solving linear equation.
- int is_equal (double n1, double n2)

  Compares two double numbers.
- int ret_code (int res_type)

  Generate program return code.
- bool unit_testing ()

  Testing SqEq functions.

2.1.1 Macro Definition Documentation

2.1.1.1 SQEQ_ERROR

```
#define SQEQ_ERROR 1
```

return this from main on error

Definition at line 8 of file SqEq.hh.

2.1.1.2 MAX_ROOT_NUM

```
#define MAX_ROOT_NUM 2
```

maximal munber of roots

Definition at line 13 of file SqEq.hh.

2.1.1.3 COEFF_NUM

```
#define COEFF_NUM 3
```

number of coefficients

Definition at line 18 of file SqEq.hh.

2.1.1.4 EPS

```
#define EPS 1e-12
```

epsilon

Definition at line 23 of file SqEq.hh.

2.1.2 Enumeration Type Documentation

2.1.2.1 ResType

```
enum ResType
```

enum with result types of solve functions

Enumerator

RT_ERROR	
RT_INV_COEFF_ERROR	
RT_NULLPTR_ERROR	
RT_VALID	
RT_NO_ROOTS	
RT_ONE_ROOT	
RT_TWO_ROOTS	
RT_INF_ROOTS	

Definition at line 28 of file SqEq.hh.

2.1.3 Function Documentation

2.1.3.1 read_coeffs()

```
bool read_coeffs (
            const char * prompt,
            double coeffs[COEFF_NUM] )
```

Reading 3 coefficients from stdin.

Parameters

in	*prompt*	message to user
out	*coeffs*	array for coeffs, length must be >= 3

Returns

true if all OK

false on error

Definition at line 13 of file SqEq.cc.

References COEFF_NUM.

2.1.3.2 print_res()

```
void print_res (
            int res_type,
            const double results[MAX_ROOT_NUM] )
```

Print squaree equations roots.

Parameters

in	*res_type*	defines error/number of roots
in	*results*	roots

Definition at line 92 of file SqEq.cc.

References RT_ERROR, RT_INF_ROOTS, RT_INV_COEFF_ERROR, RT_NO_ROOTS, RT_NULLPTR_ERROR, RT_ONE_ROOT, and RT_TWO_ROOTS.

2.1.3.3 solve_sqeq()

```
int solve_sqeq (
            const double coeffs[COEFF_NUM],
            double results[MAX_ROOT_NUM] )
```

Solving square equation.

Parameters

in	*coeffs*	array with coefficients, length must must be >= 3
out	*results*	array with roots, length must must be >= 2

Returns

result type

Definition at line 20 of file SqEq.cc.

References is_equal(), RT_ERROR, RT_INV_COEFF_ERROR, RT_NO_ROOTS, RT_NULLPTR_ERROR, RT_↩ ONE_ROOT, RT_TWO_ROOTS, and solve_linear().

2.1.3.4 solve_linear()

```
int solve_linear (
            double b,
            double c,
            double * x_ptr )
```

Solving linear equation.

Parameters

in	*b*	coeff on x
in	*c*	free member
out	*x_ptr*	result pointer

Returns

resutl type

Definition at line 71 of file SqEq.cc.

References is_equal(), RT_INF_ROOTS, RT_NO_ROOTS, and RT_ONE_ROOT.

Referenced by solve_sqeq().

2.1.3.5 is_equal()

```
int is_equal (
            double n1,
            double n2 )
```

Compares two double numbers.

Parameters

in	*n1*	1st num
in	*n2*	2nd num

Returns

int

Definition at line 87 of file SqEq.cc.

References EPS.

Referenced by solve_linear(), and solve_sqeq().

2.1.3.6 ret_code()

```
int ret_code (
            int res_type )
```

Generate program return code.

Parameters

in	*res_type*	value returned by solve function

Returns

int

Definition at line 124 of file SqEq.cc.

References RT_VALID, and SQEQ_ERROR.

2.1.3.7 unit_testing()

```
bool unit_testing ( )
```

Testing SqEq functions.

Returns

true if all tests passed

false if tests not passed

2.2 /home/tako/programming/HWHW/0_SqEq/lib/SqEq.cc File Reference

File with most important SqEq functions.

```
#include <assert.h>
#include <math.h>
#include <stdio.h>
#include "SqEq.hh"
```

Functions

- bool read_coeffs (const char *prompt, double coeffs[COEFF_NUM])

  Reading 3 coefficients from stdin.
- int solve_sqeq (const double coeffs[COEFF_NUM], double results[MAX_ROOT_NUM])

  Solving square equation.
- int solve_linear (double b, double c, double *x_ptr)

  Solving linear equation.
- int is_equal (double n1, double n2)

  Compares two double numbers.
- void print_res (int res_type, const double results[MAX_ROOT_NUM])

  Print squaree equations roots.
- int ret_code (int res_type)

  Generate program return code.

2.2.1 Detailed Description

File with most important SqEq functions.

Author

Tako

2.2.2 Function Documentation

2.2.2.1 read_coeffs()

```
bool read_coeffs (
            const char * prompt,
            double coeffs[COEFF_NUM] )
```

Reading 3 coefficients from stdin.

Parameters

in	*prompt*	message to user
out	*coeffs*	array for coeffs, length must be >= 3

Returns

true if all OK

false on error

Definition at line 13 of file SqEq.cc.

References COEFF_NUM.

2.2.2.2 solve_sqeq()

```
int solve_sqeq (
            const double coeffs[COEFF_NUM],
            double results[MAX_ROOT_NUM] )
```

Solving square equation.

Parameters

in	*coeffs*	array with coefficients, length must must be >= 3
out	*results*	array with roots, length must must be >= 2

Returns

result type

Definition at line 20 of file SqEq.cc.

References is_equal(), RT_ERROR, RT_INV_COEFF_ERROR, RT_NO_ROOTS, RT_NULLPTR_ERROR, RT_↩ ONE_ROOT, RT_TWO_ROOTS, and solve_linear().

2.2.2.3 solve_linear()

```
int solve_linear (
            double b,
            double c,
            double * x_ptr )
```

Solving linear equation.

Parameters

in	*b*	coeff on x
in	*c*	free member
out	*x_ptr*	result pointer

Returns

resutl type

Definition at line 71 of file SqEq.cc.

References is_equal(), RT_INF_ROOTS, RT_NO_ROOTS, and RT_ONE_ROOT.

Referenced by solve_sqeq().

2.2.2.4 is_equal()

```
int is_equal (
            double n1,
            double n2 )
```

Compares two double numbers.

Parameters

in	*n1*	1st num
in	*n2*	2nd num

Returns

int

Definition at line 87 of file SqEq.cc.

References EPS.

Referenced by solve_linear(), and solve_sqeq().

2.2.2.5 print_res()

```
void print_res (
            int res_type,
            const double results[MAX_ROOT_NUM] )
```

Print squaree equations roots.

Parameters

in	*res_type*	defines error/number of roots
in	*results*	roots

Definition at line 92 of file SqEq.cc.

References RT_ERROR, RT_INF_ROOTS, RT_INV_COEFF_ERROR, RT_NO_ROOTS, RT_NULLPTR_ERROR, RT_ONE_ROOT, and RT_TWO_ROOTS.

2.2.2.6 ret_code()

```
int ret_code (
            int res_type )
```

Generate program return code.

Parameters

in	*res_type*	value returned by solve function

Returns

int

Definition at line 124 of file SqEq.cc.

References RT_VALID, and SQEQ_ERROR.

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