

MSDScript

Generated by Doxygen 1.9.6

1 MSDScript	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 Class Documentation	9
5.1 AddExpr Class Reference	9
5.1.1 Member Function Documentation	10
5.1.1.1 equals()	10
5.1.1.2 has_variable()	10
5.1.1.3 interp()	10
5.1.1.4 subst()	10
5.2 Expr Class Reference	11
5.2.1 Detailed Description	11
5.2.2 Member Function Documentation	11
5.2.2.1 equals()	12
5.2.2.2 has_variable()	12
5.2.2.3 interp()	12
5.2.2.4 subst()	12
5.3 MultExpr Class Reference	12
5.3.1 Member Function Documentation	13
5.3.1.1 equals()	13
5.3.1.2 has_variable()	14
5.3.1.3 interp()	14
5.3.1.4 subst()	14
5.4 NumExpr Class Reference	15
5.4.1 Member Function Documentation	15
5.4.1.1 equals()	15
5.4.1.2 has_variable()	16
5.4.1.3 interp()	16
5.4.1.4 subst()	16
5.5 VarExpr Class Reference	17
5.5.1 Member Function Documentation	17
5.5.1.1 equals()	17
5.5.1.2 has_variable()	18
5.5.1.3 interp()	18
5.5.1.4 subst()	18

6 File Documentation	21
6.1 /Users/laurazhang/msdscript/cmdline.h File Reference	21
6.1.1 Detailed Description	21
6.2 /Users/laurazhang/msdscript/cmdline.h	21
6.3 /Users/laurazhang/msdscript/expr.cpp File Reference	21
6.3.1 Detailed Description	22
6.4 /Users/laurazhang/msdscript/expr.h File Reference	22
6.4.1 Detailed Description	22
6.5 /Users/laurazhang/msdscript/expr.h	22
Index	25

Chapter 1

MSDScript

Author

Laura Zhang

Date

02-07-2023

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

Expr	11
AddExpr	9
MultExpr	12
NumExpr	15
VarExpr	17

Chapter 3

Class Index

3.1 Class List

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

AddExpr	9
Expr	11
MultExpr	12
NumExpr	15
VarExpr	17

Chapter 4

File Index

4.1 File List

Here is a list of all documented files with brief descriptions:

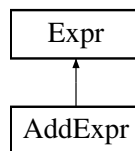
/Users/laurazhang/msdscrip/cmdline.h	
Declarations of use_arguments	21
/Users/laurazhang/msdscrip/expr.cpp	
Definitions of methods in Expr and its child classes	21
/Users/laurazhang/msdscrip/expr.h	
Declarations of methods in Expr and its child classes	22

Chapter 5

Class Documentation

5.1 AddExpr Class Reference

Inheritance diagram for AddExpr:



Public Member Functions

- **AddExpr** ([Expr](#) *lhs, [Expr](#) *rhs)
- bool [equals](#) ([Expr](#) *e)
check if two AddExprs are equal
- int [interp](#) ()
returns an int for the value of an expression
- bool [has_variable](#) ()
returns true if the expression is a variable or contains a variable
- [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)
everywhere that the expression contains a variable matching the string, the result Expr should have the given replacement*
- virtual bool [equals](#) ([Expr](#) *e)=0
- virtual int [interp](#) ()=0
- virtual bool [has_variable](#) ()=0
- virtual [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)=0

Public Attributes

- [Expr](#) * lhs_
- [Expr](#) * rhs_

5.1.1 Member Function Documentation

5.1.1.1 equals()

```
bool AddExpr::equals (
    Expr * e ) [virtual]
```

check if two AddExprs are equal

Parameters

<i>e</i>	rhs Expr* to be compared
----------	--------------------------

Returns

true if two AddExprs are equal, null if rhs is NULL

Implements [Expr](#).

5.1.1.2 has_variable()

```
bool AddExpr::has_variable ( ) [virtual]
```

returns true if the expression is a variable or contains a variable

Returns

true if either lhs or rhs is a variable or contains a variable

Implements [Expr](#).

5.1.1.3 interp()

```
int AddExpr::interp ( ) [virtual]
```

returns an int for the value of an expression

Returns

the sum of the subexpression values

Implements [Expr](#).

5.1.1.4 subst()

```
Expr * AddExpr::subst (
    std::string parameter,
    Expr * expr ) [virtual]
```

everywhere that the expression contains a variable matching the string, the result Expr* should have the given replacement

Parameters

<i>parameter</i>	the parameter to be substituted
<i>expr</i>	a new expression

Returns

a new object without changing the current object

Implements [Expr](#).

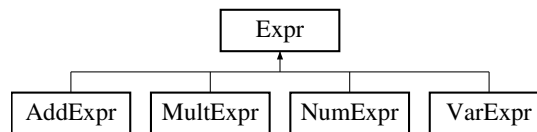
The documentation for this class was generated from the following files:

- [/Users/laurazhang/msdscrip/expr.h](#)
- [/Users/laurazhang/msdscrip/expr.cpp](#)

5.2 Expr Class Reference

```
#include <expr.h>
```

Inheritance diagram for Expr:



Public Member Functions

- virtual bool [equals](#) ([Expr](#) *e)=0
- virtual int [interp](#) ()=0
- virtual bool [has_variable](#) ()=0
- virtual [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)=0

5.2.1 Detailed Description

`<expr> = <number> | <expr> + <expr> | <expr> * <expr> | <variable>`

5.2.2 Member Function Documentation

5.2.2.1 equals()

```
virtual bool Expr::equals (
    Expr * e ) [pure virtual]
```

Implemented in [NumExpr](#), [AddExpr](#), [MultExpr](#), and [VarExpr](#).

5.2.2.2 has_variable()

```
virtual bool Expr::has_variable ( ) [pure virtual]
```

Implemented in [NumExpr](#), [AddExpr](#), [MultExpr](#), and [VarExpr](#).

5.2.2.3 interp()

```
virtual int Expr::interp ( ) [pure virtual]
```

Implemented in [NumExpr](#), [AddExpr](#), [MultExpr](#), and [VarExpr](#).

5.2.2.4 subst()

```
virtual Expr * Expr::subst (
    std::string parameter,
    Expr * expr ) [pure virtual]
```

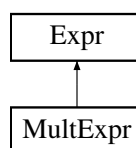
Implemented in [NumExpr](#), [AddExpr](#), [MultExpr](#), and [VarExpr](#).

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

- [/Users/laurazhang/msdscrip/expr.h](#)

5.3 MultExpr Class Reference

Inheritance diagram for MultExpr:



Public Member Functions

- **MultExpr** ([Expr](#) *lhs, [Expr](#) *rhs)
- bool [equals](#) ([Expr](#) *e)
check if two MultExprs are equal
- int [interp](#) ()
returns an int for the value of an expression
- bool [has_variable](#) ()
returns true if the expression is a variable or contains a variable
- [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)
everywhere that the expression contains a variable matching the string, the result Expr should have the given replacement*
- virtual bool [equals](#) ([Expr](#) *e)=0
- virtual int [interp](#) ()=0
- virtual bool [has_variable](#) ()=0
- virtual [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)=0

Public Attributes

- [Expr](#) * lhs_
- [Expr](#) * rhs_

5.3.1 Member Function Documentation

5.3.1.1 equals()

```
bool MultExpr::equals (
    Expr * e ) [virtual]
```

check if two MultExprs are equal

Parameters

<i>e</i>	rhs Expr* to be compared
----------	--------------------------

Returns

true if two MultExprs are equal, null if rhs is NULL

Implements [Expr](#).

5.3.1.2 has_variable()

```
bool MultExpr::has_variable ( ) [virtual]
```

returns true if the expression is a variable or contains a variable

Returns

true if either lhs or rhs is a variable or contains a variable

Implements [Expr](#).

5.3.1.3 interp()

```
int MultExpr::interp ( ) [virtual]
```

returns an int for the value of an expression

Returns

the product of the subexpression values

Implements [Expr](#).

5.3.1.4 subst()

```
Expr * MultExpr::subst (
    std::string parameter,
    Expr * expr ) [virtual]
```

everywhere that the expression contains a variable matching the string, the result Expr* should have the given replacement

Parameters

<i>parameter</i>	the parameter to be substituted
<i>expr</i>	a new expression

Returns

a new object without changing the current object

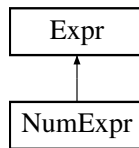
Implements [Expr](#).

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

- [/Users/laurazhang/msdscript/expr.h](#)
- [/Users/laurazhang/msdscript/expr.cpp](#)

5.4 NumExpr Class Reference

Inheritance diagram for NumExpr:



Public Member Functions

- **NumExpr** (int val)
- bool **equals** (Expr *e)
check if two NumExprs are equal
- int **interp** ()
returns an int for the value of an expression
- bool **has_variable** ()
returns true if the expression is a variable or contains a variable
- Expr * **subst** (std::string parameter, Expr *expr)
everywhere that the expression contains a variable matching the string, the result Expr should have the given replacement*
- virtual bool **equals** (Expr *e)=0
- virtual int **interp** ()=0
- virtual bool **has_variable** ()=0
- virtual Expr * **subst** (std::string parameter, Expr *expr)=0

Public Attributes

- int **val_**

5.4.1 Member Function Documentation

5.4.1.1 equals()

```
bool NumExpr::equals (
    Expr * e ) [virtual]
```

check if two NumExprs are equal

Parameters

<i>e</i>	rhs Expr* to be compared
----------	--------------------------

Returns

true if two NumExprs are equal, null if rhs is NULL

Implements [Expr](#).

5.4.1.2 has_variable()

```
bool NumExpr::has_variable ( ) [virtual]
```

returns true if the expression is a variable or contains a variable

Returns

false

Implements [Expr](#).

5.4.1.3 interp()

```
int NumExpr::interp ( ) [virtual]
```

returns an int for the value of an expression

Returns

the value of a [NumExpr](#)

Implements [Expr](#).

5.4.1.4 subst()

```
Expr * NumExpr::subst (
    std::string parameter,
    Expr * expr ) [virtual]
```

everywhere that the expression contains a variable matching the string, the result Expr* should have the given replacement

Parameters

<i>parameter</i>	the parameter to be substituted
<i>expr</i>	a new expression

Returns

a new object without changing the current object

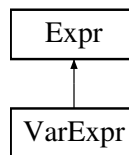
Implements [Expr](#).

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

- [/Users/laurazhang/msdscrip/expr.h](#)
- [/Users/laurazhang/msdscrip/expr.cpp](#)

5.5 VarExpr Class Reference

Inheritance diagram for VarExpr:

**Public Member Functions**

- **VarExpr** (std::string var)
- bool [equals](#) ([Expr](#) *e)
check if two VarExprs are equal
- int [interp](#) ()
returns an int for the value of an expression
- bool [has_variable](#) ()
returns true if the expression is a variable or contains a variable
- [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)
everywhere that the expression contains a variable matching the string, the result Expr should have the given replacement*
- virtual bool [equals](#) ([Expr](#) *e)=0
- virtual int [interp](#) ()=0
- virtual bool [has_variable](#) ()=0
- virtual [Expr](#) * [subst](#) (std::string parameter, [Expr](#) *expr)=0

Public Attributes

- std::string [var_](#)

5.5.1 Member Function Documentation

5.5.1.1 equals()

```
bool VarExpr::equals (
    Expr * e ) [virtual]
```

check if two VarExprs are equal

Parameters

<i>e</i>	rhs Expr* to be compared
----------	--------------------------

Returns

true if two VarExprs are equal, null if rhs is NULL

Implements [Expr](#).

5.5.1.2 has_variable()

```
bool VarExpr::has_variable ( ) [virtual]
```

returns true if the expression is a variable or contains a variable

Returns

true

Implements [Expr](#).

5.5.1.3 interp()

```
int VarExpr::interp ( ) [virtual]
```

returns an int for the value of an expression

Returns

throw an std::runtime_error exception

Implements [Expr](#).

5.5.1.4 subst()

```
Expr * VarExpr::subst (
    std::string parameter,
    Expr * expr ) [virtual]
```

everywhere that the expression contains a variable matching the string, the result Expr* should have the given replacement

Parameters

<i>parameter</i>	the parameter to be substituted
<i>expr</i>	a new expression

Returns

a new object without changing the current object

Implements [Expr](#).

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

- [/Users/laurazhang/msdscript/expr.h](#)
- [/Users/laurazhang/msdscript/expr.cpp](#)

Chapter 6

File Documentation

6.1 /Users/laurazhang/msdscrip/cmdline.h File Reference

Declarations of use_arguments.

Functions

- int **use_arguments** (int argc, char **argv)

6.1.1 Detailed Description

Declarations of use_arguments.

Author

Laura Zhang

6.2 /Users/laurazhang/msdscrip/cmdline.h

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

```
00001
00007 #pragma once
00008
00009 int use_arguments(int argc, char **argv);
```

6.3 /Users/laurazhang/msdscrip/expr.cpp File Reference

Definitions of methods in [Expr](#) and its child classes.

```
#include "expr.h"
#include <stdexcept>
```

6.3.1 Detailed Description

Definitions of methods in [Expr](#) and its child classes.

Author

Laura Zhang

6.4 /Users/laurazhang/msdscript/expr.h File Reference

Declarations of methods in [Expr](#) and its child classes.

```
#include <string>
```

Classes

- class [Expr](#)
- class [NumExpr](#)
- class [AddExpr](#)
- class [MultExpr](#)
- class [VarExpr](#)

6.4.1 Detailed Description

Declarations of methods in [Expr](#) and its child classes.

Author

Laura Zhang

6.5 /Users/laurazhang/msdscript/expr.h

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

```
00001
00007 #pragma once
00008
00009 #include <string>
00010
00017 class Expr {
00018 public:
00019     virtual bool equals(Expr *e) = 0;
00020     virtual int interp() = 0;
00021     virtual bool has_variable() = 0;
00022     virtual Expr* subst(std::string parameter, Expr* expr) = 0;
00023 };
00024
00025 class NumExpr : public Expr {
00026 public:
00027     int val_;
00028
00029     NumExpr(int val);
00030     bool equals(Expr *e);
00031     int interp();
00032     bool has_variable();
00033     Expr* subst(std::string parameter, Expr* expr);
00034 };
```

```
00035
00036 class AddExpr : public Expr {
00037 public:
00038     Expr *lhs_;
00039     Expr *rhs_;
00040
00041     AddExpr(Expr *lhs, Expr *rhs);
00042     bool equals(Expr *e);
00043     int interp();
00044     bool has_variable();
00045     Expr* subst(std::string parameter, Expr* expr);
00046 };
00047
00048 class MultExpr : public Expr {
00049 public:
00050     Expr *lhs_;
00051     Expr *rhs_;
00052
00053     MultExpr(Expr *lhs, Expr *rhs);
00054     bool equals(Expr *e);
00055     int interp();
00056     bool has_variable();
00057     Expr* subst(std::string parameter, Expr* expr);
00058 };
00059
00060 class VarExpr : public Expr {
00061 public:
00062     std::string var_;
00063
00064     VarExpr(std::string var);
00065     bool equals(Expr *e);
00066     int interp();
00067     bool has_variable();
00068     Expr* subst(std::string parameter, Expr* expr);
00069 };
```


Index

[/Users/laurazhang/msdscript/cmdline.h, 21](#)
[/Users/laurazhang/msdscript/expr.cpp, 21](#)
[/Users/laurazhang/msdscript/expr.h, 22](#)

AddExpr, [9](#)
 [equals, 10](#)
 [has_variable, 10](#)
 [interp, 10](#)
 [subst, 10](#)

equals
 AddExpr, [10](#)
 Expr, [11](#)
 MultExpr, [13](#)
 NumExpr, [15](#)
 VarExpr, [17](#)

Expr, [11](#)
 [equals, 11](#)
 [has_variable, 12](#)
 [interp, 12](#)
 [subst, 12](#)

has_variable
 AddExpr, [10](#)
 Expr, [12](#)
 MultExpr, [13](#)
 NumExpr, [16](#)
 VarExpr, [18](#)

interp
 AddExpr, [10](#)
 Expr, [12](#)
 MultExpr, [14](#)
 NumExpr, [16](#)
 VarExpr, [18](#)

MultExpr, [12](#)
 [equals, 13](#)
 [has_variable, 13](#)
 [interp, 14](#)
 [subst, 14](#)

NumExpr, [15](#)
 [equals, 15](#)
 [has_variable, 16](#)
 [interp, 16](#)
 [subst, 16](#)

subst
 AddExpr, [10](#)
 Expr, [12](#)

MultExpr, [14](#)
NumExpr, [16](#)
VarExpr, [18](#)

VarExpr, [17](#)
 [equals, 17](#)
 [has_variable, 18](#)
 [interp, 18](#)
 [subst, 18](#)