My Project

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Chapter 1

MSDScript

Author

Randi Prince

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Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

File Index

4.1 File List

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

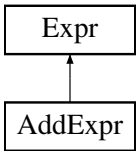
Chapter 5

Class Documentation

5.1 AddExpr Class Reference

`#include <expr.hpp>`

Inheritance diagram for AddExpr:



Public Member Functions

- AddExpr (Expr *lhs, Expr *rhs)
- bool equals (Expr *expr)

  determines if one Expr is equal to another Expr
- int interp ()

  returns an int for the value of an expression.
- bool has_variable ()

  function to determine if the expr has a varExpr
- Expr * subst (std::string s, Expr *e)

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr should have the given replacement, instead.*

- virtual bool equals (Expr *e)=0

  determines if one Expr is equal to another Expr
- virtual int interp ()=0

  returns an int for the value of an expression.
- virtual bool has_variable ()=0

  function to determine if the expr has a varExpr
- virtual Expr * subst (std::string s, Expr *e)=0

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr should have the given replacement, instead.*

Public Attributes

- Expr * lhs
- Expr * rhs

5.1.1 Detailed Description

@brief AddExpr class This is a sub class that implements Expr. It adds two expr together It implements all virtual methods of expr.

5.1.2 Constructor & Destructor Documentation

5.1.2.1 AddExpr()

```
AddExpr::AddExpr (
            Expr * lhs,
            Expr * rhs )
```

Constructor that creates new AddExpr.

Parameters

lhs	a pointer to an Expr
rhs	a pointer to an Expr

5.1.3 Member Function Documentation

5.1.3.1 equals()

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

determines if one Expr is equal to another Expr

Parameters

e	to compare the value of

Returns

boolean

Implements Expr.

5.1.3.2 has_variable()

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

function to determine if the expr has a varExpr

Returns

boolean

Implements Expr.

5.1.3.3 interp()

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

returns an int for the value of an expression.

Returns

int

Implements Expr.

5.1.3.4 subst()

```
Expr * AddExpr::subst (
            std::string s,
            Expr * e )  [virtual]
```

Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr* should have the given replacement, instead.

Parameters

s	
e	pointer

Returns

Expr

Implements Expr.

5.1.4 Member Data Documentation

5.1.4.1 lhs

```
Expr* AddExpr::lhs
```

left hand side expr of AddExpr

5.1.4.2 rhs

```
Expr* AddExpr::rhs
```

right hand side expr of AddExpr

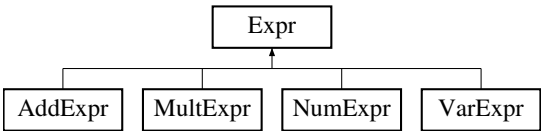
The documentation for this class was generated from the following files:

- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp
- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.cpp

5.2 Expr Class Reference

```
#include <expr.hpp>
```

Inheritance diagram for Expr:



Public Member Functions

- virtual bool equals (Expr *e)=0

  determines if one Expr is equal to another Expr
- virtual int interp ()=0

  returns an int for the value of an expression.
- virtual bool has_variable ()=0

  function to determine if the expr has a varExpr
- virtual Expr * subst (std::string s, Expr *e)=0

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr should have the given replacement, instead.*

5.2.1 Detailed Description

@brief Expr class This is a parent class called Expr. It has virtual methods used by sub classes.

5.2.2 Member Function Documentation

5.2.2.1 equals()

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

determines if one Expr is equal to another Expr

Parameters

e	to compare the value of

Returns

boolean

Implemented in NumExpr, AddExpr, MultExpr, and VarExpr.

5.2.2.2 has_variable()

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

function to determine if the expr has a varExpr

Returns

boolean

Implemented in NumExpr, AddExpr, MultExpr, and VarExpr.

5.2.2.3 interp()

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

returns an int for the value of an expression.

Returns

int

Implemented in NumExpr, AddExpr, MultExpr, and VarExpr.

5.2.2.4 subst()

```
virtual Expr * Expr::subst (
            std::string s,
            Expr * e )  [pure virtual]
```

Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

Parameters

s	
e	pointer

Returns

Expr

Implemented in NumExpr, AddExpr, MultExpr, and VarExpr.

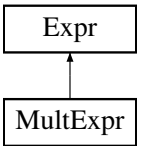
The documentation for this class was generated from the following file:

- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp

5.3 MultExpr Class Reference

```
#include <expr.hpp>
```

Inheritance diagram for MultExpr:



Public Member Functions

- MultExpr (Expr ∗lhs, Expr ∗rhs)
- bool equals (Expr ∗expr)

  determines if one Expr is equal to another Expr
- int interp ()

  returns an int for the value of an expression.
- bool has_variable ()

  function to determine if the expr has a varExpr
- Expr ∗ subst (std::string s, Expr ∗e)

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

- virtual bool equals (Expr ∗e)=0

  determines if one Expr is equal to another Expr
- virtual int interp ()=0

  returns an int for the value of an expression.
- virtual bool has_variable ()=0

  function to determine if the expr has a varExpr
- virtual Expr ∗ subst (std::string s, Expr ∗e)=0

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

Public Attributes

- Expr ∗ lhs
- Expr ∗ rhs

5.3.1 Detailed Description

@brief MultExpr class This is a sub class that implements Expr. It multiplies two expr together It implements all virtual methods of expr.

5.3.2 Constructor & Destructor Documentation

5.3.2.1 MultExpr()

```
MultExpr::MultExpr (
            Expr * lhs,
            Expr * rhs )
```

Constructor that creates new MultExpr.

Parameters

lhs	a pointer to an Expr
rhs	a pointer to an Expr

5.3.3 Member Function Documentation

5.3.3.1 equals()

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

determines if one Expr is equal to another Expr

Parameters

e	to compare the value of

Returns

boolean

Implements Expr.

5.3.3.2 has_variable()

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

function to determine if the expr has a varExpr

Returns

boolean

Implements Expr.

5.3.3.3 interp()

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

returns an int for the value of an expression.

Returns

int

Implements Expr.

5.3.3.4 subst()

```
Expr * MultExpr::subst (
            std::string s,
            Expr * e )  [virtual]
```

Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr* should have the given replacement, instead.

Parameters

s	
e	pointer

Returns

Expr

Implements Expr.

5.3.4 Member Data Documentation

5.3.4.1 lhs

```
Expr* MultExpr::lhs
```

left hand side expr of MultExpr

5.3.4.2 rhs

```
Expr* MultExpr::rhs
```

right hand side expr of MultExpr

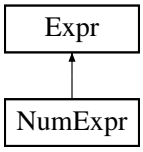
The documentation for this class was generated from the following files:

- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp
- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.cpp

5.4 NumExpr Class Reference

```
#include <expr.hpp>
```

Inheritance diagram for NumExpr:



Public Member Functions

- NumExpr (int val)

  constructor of NumExpr class
- bool equals (Expr ∗expr)

  determines if one Expr is equal to another Expr
- int interp ()

  returns an int for the value of an expression.
- bool has_variable ()

  function to determine if the expr has a varExpr
- Expr ∗ subst (std::string s, Expr ∗e)

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

- virtual bool equals (Expr ∗e)=0

  determines if one Expr is equal to another Expr
- virtual int interp ()=0

  returns an int for the value of an expression.
- virtual bool has_variable ()=0

  function to determine if the expr has a varExpr
- virtual Expr ∗ subst (std::string s, Expr ∗e)=0

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

Public Attributes

- int val

5.4.1 Detailed Description

@brief NumExpr class This is a sub class that implements Expr. It is an expr that is an integer It implements all virtual methods of expr.

5.4.2 Constructor & Destructor Documentation

5.4.2.1 NumExpr()

```
NumExpr::NumExpr (
            int val )
```

constructor of NumExpr class

Parameters

val	

5.4.3 Member Function Documentation

5.4.3.1 equals()

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

determines if one Expr is equal to another Expr

Parameters

e	to compare the value of

Returns

boolean

Implements Expr.

5.4.3.2 has_variable()

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

function to determine if the expr has a varExpr

Returns

boolean

Implements Expr.

5.4.3.3 interp()

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

returns an int for the value of an expression.

Returns

int

Implements Expr.

5.4.3.4 subst()

```
Expr * NumExpr::subst (
            std::string s,
            Expr * e )  [virtual]
```

Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr* should have the given replacement, instead.

Parameters

s	
e	pointer

Returns

Expr

Implements Expr.

5.4.4 Member Data Documentation

5.4.4.1 val

```
int NumExpr::val
```

integer value member variable of NumExpr class

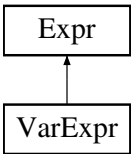
The documentation for this class was generated from the following files:

- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp
- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.cpp

5.5 VarExpr Class Reference

```
#include <expr.hpp>
```

Inheritance diagram for VarExpr:



Public Member Functions

- VarExpr (std::string val)
- bool equals (Expr ∗expr)

  determines if one Expr is equal to another Expr
- int interp ()

  returns an int for the value of an expression.
- bool has_variable ()

  function to determine if the expr has a varExpr
- Expr ∗ subst (std::string s, Expr ∗e)

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

- virtual bool equals (Expr ∗e)=0

  determines if one Expr is equal to another Expr
- virtual int interp ()=0

  returns an int for the value of an expression.
- virtual bool has_variable ()=0

  function to determine if the expr has a varExpr
- virtual Expr ∗ subst (std::string s, Expr ∗e)=0

  Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr∗ should have the given replacement, instead.

Public Attributes

- std::string val

5.5.1 Detailed Description

@brief VarExpr class This is a sub class that implements Expr. It is an expr that is a string. It implements all virtual methods of expr.

5.5.2 Constructor & Destructor Documentation

5.5.2.1 VarExpr()

```
VarExpr::VarExpr (
            std::string val )
```

Constructor that creates new VarExpr.

Parameters

val	is a string

5.5.3 Member Function Documentation

5.5.3.1 equals()

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

determines if one Expr is equal to another Expr

Parameters

e	to compare the value of

Returns

boolean

Implements Expr.

5.5.3.2 has_variable()

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

function to determine if the expr has a varExpr

Returns

boolean

Implements Expr.

5.5.3.3 interp()

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

returns an int for the value of an expression.

Returns

int

Implements Expr.

5.5.3.4 subst()

```
Expr * VarExpr::subst (
            std::string s,
            Expr * e )  [virtual]
```

Everywhere that the expression (whose subst method is called) contains a variable matching the string, the result Expr* should have the given replacement, instead.

Parameters

s	
e	pointer

Returns

Expr

Implements Expr.

5.5.4 Member Data Documentation

5.5.4.1 val

```
std::string VarExpr::val
```

String called val, which is a member variable of VarExpr

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

- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp
- /Users/randiprince/cs6015/MSDscript/MSDscript/expr.cpp

Chapter 6

File Documentation

6.1 /Users/randiprince/cs6015/MSDscript/MSDscript/commandLine.cpp File Reference

contains use_argument function definition

```
#include "commandLine.hpp"
#include "catch.h"
#include <iostream>
#include <cstdlib>
```

Functions

- void use_arguments (int argc, char ∗argv[ ])
  function to call in main

6.1.1 Detailed Description

contains use_argument function definition

Author

Randi Prince

6.1.2 Function Documentation

6.1.2.1 use_arguments()

```
void use_arguments (
            int argc,
            char * argv[] )
```

function to call in main

Parameters

argc	
argv	

6.2 /Users/randiprince/cs6015/MSDscript/MSDscript/commandLine.hpp File Reference

contains use_argument function declaration

Functions

- void use_arguments (int argc, char ∗argv[ ])
  function to call in main

6.2.1 Detailed Description

contains use_argument function declaration

Author

Randi Prince

6.2.2 Function Documentation

6.2.2.1 use_arguments()

```
void use_arguments (
            int argc,
            char * argv[] )
```

function to call in main

Parameters

argc	
argv	

6.3 /Users/randiprince/cs6015/MSDscript/MSDscript/commandLine.hpp

Go to the documentation of this file.

```
00001 //
00002 //  commandLine.hpp
00003 //  MSDscript
00004 //
00005 //  Created by Randi Prince on 1/15/23.
00006 //
00013 #ifndef commandLine_hpp
00014 #define commandLine_hpp
00015
00016
00022 void use_arguments(int argc, char * argv[]);
00023
00024 #endif /* commandLine_hpp */
```

6.4 /Users/randiprince/cs6015/MSDscript/MSDscript/expr.cpp File Reference

contains expression class definitions for all the sub classes of Expr class

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

6.4.1 Detailed Description

contains expression class definitions for all the sub classes of Expr class

Author

Randi Prince

6.5 /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp File Reference

contains expression class declarations for all the sub classes of Expr class

```
#include <string>
```

Classes

- class Expr
- class NumExpr
- class AddExpr
- class MultExpr
- class VarExpr

6.5.1 Detailed Description

contains expression class declarations for all the sub classes of Expr class

Author

Randi Prince

6.6 /Users/randiprince/cs6015/MSDscript/MSDscript/expr.hpp

Go to the documentation of this file.

```
00001 //
00002 //  expr.hpp
00003 //  MSDscript
00004 //
00005 //  Created by Randi Prince on 1/23/23.
00006 //
00007
00014 #ifndef expr_hpp
00015 #define expr_hpp
00016
00017 #include <string>
00018
00024 class Expr {
00025 public:
00031     virtual bool equals(Expr *e) = 0;
00032
00037     virtual int interp() = 0;
00042     virtual bool has_variable() = 0;
00043
00051     virtual Expr* subst(std::string s, Expr *e) = 0;
00052 };
00053
00059 class NumExpr : public Expr {
00060 public:
00061     int val;
00067     NumExpr(int val);
00068     bool equals(Expr *expr);
00069     int interp();
00070     bool has_variable();
00071     Expr* subst(std::string s, Expr *e);
00072 };
00073
00079 class AddExpr : public Expr {
00080 public:
00081     Expr *lhs;
00082     Expr *rhs;
00089     AddExpr(Expr *lhs, Expr *rhs);
00090     bool equals(Expr *expr);
00091     int interp();
00092     bool has_variable();
00093     Expr* subst(std::string s, Expr *e);
00094 };
00095
00101 class MultExpr : public Expr {
00102 public:
00103     Expr *lhs;
00104     Expr *rhs;
00110     MultExpr(Expr *lhs, Expr *rhs);
00111     bool equals(Expr *expr);
00112     int interp();
00113     bool has_variable();
00114     Expr* subst(std::string s, Expr *e);
00115 };
00116
00122 class VarExpr : public Expr {
00123 public:
00124     std::string val;
00130     VarExpr(std::string val);
00131
00132     bool equals(Expr *expr);
00133     int interp();
00134     bool has_variable();
00135     Expr* subst(std::string s, Expr *e);
00136 };
00137
00138 #endif /* expr_hpp */
```

6.7 /Users/randiprince/cs6015/MSDscript/MSDscript/tests.cpp File Reference

contains tests for msdscript program

```
#include "catch.h"
#include "expr.hpp"
```

Functions

- TEST_CASE ("Test NumExpr equals")
- TEST_CASE ("Test AddExpr equals")
- TEST_CASE ("Test MultExpr equals")
- TEST_CASE ("Test VarExpr equals")
- TEST_CASE ("Interp Function")
- TEST_CASE ("Has VarExpr Function")
- TEST_CASE ("Substitution (subst) function")

6.7.1 Detailed Description

contains tests for msdscript program

Author

Randi Prince

6.7.2 Function Documentation

6.7.2.1 TEST_CASE() [1/7]

```
TEST_CASE (
              "Has VarExpr Function"  )
```

@brief Test has_variable function Tests of has_variable function for each class

6.7.2.2 TEST_CASE() [2/7]

```
TEST_CASE (
              "Interp Function"  )
```

@brief Test Interp function Tests of interp function for each class

6.7.2.3 TEST_CASE() [3/7]

```
TEST_CASE (
              "Substitution (subst) function"  )
```

@brief Test subst function Tests of subst function for each class

6.7.2.4 TEST_CASE() [4/7]

```
TEST_CASE (
              "Test AddExpr equals"  )
```

@brief Test AddExpr equals Tests of AddExpr equals function

6.7.2.5 TEST_CASE() [5/7]

```
TEST_CASE (
            "Test MultExpr equals"  )
```

@brief Test MultExpr equals Tests of MultExpr equals function

6.7.2.6 TEST_CASE() [6/7]

```
TEST_CASE (
            "Test NumExpr equals"  )
```

@brief Test NumExpr equals Tests of numExpr equals function

6.7.2.7 TEST_CASE() [7/7]

```
TEST_CASE (
            "Test VarExpr equals"  )
```

@brief Test VarExpr equals Tests of VarExpr equals function

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