

# Namespace BOOSE

## Classes

### [AboutBOOSE](#)

V1.09

Basic Object Orientated Software Engineering.

This is a set of classes for implementing the BOOSE language.

To replace class functionality you can either implement the relevant interface to completely replace all functionality, or extend the relevant class and override the interface methods, which will allow the calling of base methods in the original class.

Example of adding a command to BOOSE. Here I will call the new program AppBOOSE and append App to class names (but you can call them what you like).

step 1 extend ICanvas to have your new draw command that will be called when its command is executed, IAppCanvas.

step 2 extend this new interface with a class (AppCanvas) which creates a drawing object (bitmap?) does all the actual drawing.

step 3 extend appropriate command Interface to create a new command class. i.e. Rect(width, height) would extend ICommandTwoParameters.

step 4 extend the original factory if you want to use any of its existing commands (by calling base.MakeCommand() after looking for your new commands) or ICommandFactory if completely replacing it.

BOOSE is restricted via a set of constants that limit its functionality unless the restrictions are turned off. They can only be turned off at the source code level (i.e. by the author only).

1.04 reduced restrictions on graphics commands.

1.06 added restrictions method in evaluation, to move where restrictions are located.

1.08 added new restrictions to Array, moved restrictions from evaluation to Int, Real and Boolean.

1.09 added new restrictions to compound commands and methods, made program size simpler.

1.1 fixed bug stopping restrictions on arrays.

### [Array](#)

An array command takes the form "array int myArray 10,2" or "array real prices 10" [array][(type)][(size)][(optional dimensions, 1 if not given)]

### [BOOSEException](#)

Generic BOOSE Language exception Extends Exception

### [Boolean](#)

Boolean datatype, also used for Conditional Commands.

### [Call](#)

Command to call a previously defined method.

## [Canvas](#)

Abstract class that implements CanvasInterface. See CanvasInterface documentation for what to implement. This class handles all the drawing on your system according to above ocumentation. BOOSE does not by default specify a default drawing Canvas (only this).

## [CanvasCommand](#)

Derived class to add a drawing surface that implements the ICanvas interface.

## [CanvasException](#)

Exception generated by the Canvas class.

## [Cast](#)

Cast real values to int values.

## [Circle](#)

Draw a circle round the current cursor position.

## [Command](#)

Abstract class for commands with a parameter list or expression. This class will seperate the parameters or expression from the command and store in the "ParameterList". The Command's Compile() method is called by the parser and this is expected to set the Command's parameters. CheckParameters

## [CommandException](#)

Exception generated by the StoredProgram class.

## [CommandFactory](#)

## [CommandOneParameter](#)

Commands with two parameters. Each command has an Xpos and Ypos that operates from the current cursor position.

## [CommandThreeParameters](#)

Commands with two parameters. Each command has an Xpos and Ypos that operates from the current cursor position.

## [CommandTwoParameters](#)

Commands with two parameters. Each command has an Xpos and Ypos that operates from the current cursor position.

## [CompoundCommand](#)

CompoundCommand is a building block for shared functionality between CompoundCommands, such as ELSE and ENDS

## [ConditionalCommand](#)

Extends Var because it has an expression, only this time it directly affects execution.

## [DrawTo](#)

Draw a line from to current cursor position to the provided x,y position.

## [Else](#)

An Else is like an Endif but it pops the corresponding If off the stack and pushes itself on so that it becomes the corresponding command to the end

## [End](#)

End command for If/While/For/Method. BOOSE has only one End type command which has a parameter to say what it belongs so eg. "end if". End checks Boose types for the ciorresponding command (If/While/For/Method) and will likely require a complete rewrite to replcae those commands. It would probbaly be easier to replace Parser, StoredProgram, CompoundCommand and this. Look at the metghods each provides, if you like, and try and fill in their fucntionality.

## [Evaluation](#)

An evaluation encompasses all things that can have a value, such as variables, expressions and conditions used in loops and ifs.

## [FactoryException](#)

exception generated by the StoredProgram class

## [For](#)

For command. Adds processing at compile() and execute() to process a for command.

## [If](#)

If command. Adds processing at compile() and execute() to process an if command.

## [Int](#)

Command Class to define and store integer values.

## [Method](#)

Method declaration command. Overcoming method restrictions will require a complete rewrite. It would be simpler to do this after Parser and StoredProgram. You are getting to the stage where you need to do a big rewrite.

## [MoveTo](#)

Set the cursor position, for subsequent drawing operations, to the provide x,y position.

## Parser

The parser takes a program, who's lines are seperated by "\n", and attempts to create a StoredProgram. Once the StoredProgram has been created it then can be run. As much processing that can be done is done here because it has no run penalty (other than starting the program). Command objects are created and their parameters processed as much as possible. Variables are checked for existance but expressions cannot be processed until runtime.

## ParserException

exception generated by the Parser class to denote syntax errors

## Peek

Peek an array, i.e. get the value of an array cell. [variable] = peek [array name] [row] [optional column]

## PenColour

Set the pen for the next drawing operations to the provided r,g,b colour.

## Poke

Poke an array, i.e. set the value of an array cell. poke [array name] [row] [optional column] = [value]

## Real

Class for a Real Number Variable.

## Rect

Draw a rectangle of provided width and height with the current cursor position being the top left corner.

## RestrictionException

Exception thrown when restrictions are breached. If you get this you need to write your own code for the facility.

## StoredProgram

A collection class for storing a program of Command objects, extends ArrayList to add a program counter and a flag to indicate that the syntax is ok and the program valid. Adds methods below to process variables and methods and implements flow of control for ifs and loops.

## StoredProgramException

exception generated by the StoredProgram class

## VarException

Exception raised by variable commands.

## While

While command. So far blank as it doesn't do anything beyond ConditionalCommand but it makes the code clearer (in the factory).

# Interfaces

## [ICanvas](#)

Implement ICanvas for your BOOSE renderer. It has an Xpos and Ypos of the current cursor position, and a pen colour. Your class should implement the methods below to draw on its "bitmap" (i.e. it may not be a bitmap, it could draw in ASCII text for example).

## [ICommand](#)

Interface for new commands. Any new Command class should implement this interface and be generated by a CommandFactory that implements the ICommandFactory interface. Contains methods to set the Command up after its creation, manage its parameters when it is compiled and execute it when it is called.

## [ICommandFactory](#)

To add commands to BOOSE you must create a CommandFactory that uses this interface. You should extend the existing BOOSE:CommandFactory (which implements this interface) and then implement the MakeCommand() method. It should create a new command object based on the string passed. Any standard BOOSE commands can then be made by calling base.MakeCommand();

## [IEvaluation](#)

IEvaluation adds properties to get and set an Evaluations name, value and expression. An evaluation can be a variable declaration, such as "int total" or "real area". It can be change of value of a variable, such as "total = total + 1", the part after the "=" is referred to as an "expression". In the first two cases the parser will generate an Int object and a Real Object. In the third case it will generate a "Evaluation" object.

## [IParser](#)

The Parser Class takes a BOOSE program as a String with each command separated by '\n' and creates command objects for each valid command and stores them in the passed in StoredProgram. Exceptions are generated for any syntax errors. When each valid command is generated its Compile() method is called. The valid command will have its parameters processed and any variables identified. It is the role of StoredProgram to run the commands.

## [IStoredProgram](#)

# Enums

## [ConditionalCommand.conditionalTypes](#)

Enumerated type to represent individual conditional commands.

# Class AboutBOOSE

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

V1.09

Basic Object Orientated Software Engineering.

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step 2 extend this new interface with a class (AppCanvas) which creates a drawing object (bitmap?) does all the actual drawing.

step 3 extend appropriate command Interface to create a new command class. i.e. Rect(width, height) would extend ICommandTwoParameters.

step 4 extend the original factory if you want to use any of its existing commands (by calling base.MakeCommand() after looking for your new commands) or ICommandFactory if completely replacing it.

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1.09 added new restrictions to compound commands and methods, made program size simpler.

1.1 fixed bug stopping restrictions on arrays.

```
public static class AboutBOOSE
```

Inheritance

[object](#) ↗ ← AboutBOOSE

Inherited Members

[object.Equals\(object\)](#) ↗ , [object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ , [object.GetType\(\)](#) ↗ ,  
[object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗ , [object.ToString\(\)](#) ↗

## Fields

### ARRAYLIMIT

```
public const int ARRAYLIMIT = 2
```

#### Field Value

[int↗](#)

### BODYLIMIT

```
public const int BODYLIMIT = 5
```

#### Field Value

[int↗](#)

### COMPOUNCOMMANDLIMIT

```
public const int COMPOUNCOMMANDLIMIT = 2
```

#### Field Value

[int↗](#)

### MAXITTERATIONS

```
public const int MAXITTERATIONS = 50
```

#### Field Value

[int↗](#)

## MAXPROGRAMSIZE

```
public const int MAXPROGRAMSIZE = 20
```

Field Value

[int↗](#)

## METHODLIMIT

```
public const int METHODLIMIT = 1
```

Field Value

[int↗](#)

## RESTRICTIONS

```
public const bool RESTRICTIONS = true
```

Field Value

[bool↗](#)

## SIZELIMIT

```
public const int SIZELIMIT = 2000
```

Field Value

[int↗](#)

## VARIABLELIMIT

```
public const int VARIABLELIMIT = 5
```

Field Value

[int](#)

## Properties

### Version

Get version of BOOSE

```
public static float Version { get; }
```

Property Value

[float](#)

## Methods

### about()

```
public static string about()
```

Returns

[string](#)

# Class Array

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

An array command takes the form "array int myArray 10,2" or "array real prices 10" [array][(type)][(size)] [(optional dimensions, 1 if not given)]

```
public class Array : Evaluation, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← [Array](#)

Implements

[ICommand](#)

Derived

[Peek](#), [Poke](#)

Inherited Members

[Evaluation.expression](#), [Evaluation.evaluatedExpression](#), [Evaluation.varName](#), [Evaluation.value](#),  
[Evaluation.Expression](#), [Evaluation.VarName](#), [Evaluation.Value](#), [Evaluation.Local](#),  
[Evaluation.ProcessExpression\(string\)](#), [Command.program](#), [Command.parameterList](#),  
[Command.parameters](#), [Command.paramsint](#), [Command.Program](#), [Command.Name](#),  
[Command.ParameterList](#), [Command.Parameters](#), [Command.Parmsint](#),  
[Command.Set\(StoredProgram, string\)](#), [Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#),  
[object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#), [object.GetType\(\)](#),  
[object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Constructors

### Array()

Constructor calls restrictions.

```
public Array()
```

## Fields

### PEEK

```
protected const bool PEEK = false
```

#### Field Value

[bool ↗](#)

### POKE

```
public const bool POKE = true
```

#### Field Value

[bool ↗](#)

### column

```
protected int column
```

#### Field Value

[int ↗](#)

### columnS

```
protected string columnS
```

#### Field Value

[string ↗](#)

## columns

```
protected int columns
```

### Field Value

[int](#)

## intArray

```
protected int[,] intArray
```

### Field Value

[int](#)[]

## peekVar

```
protected string peekVar
```

### Field Value

[string](#)

## pokeValue

```
protected string pokeValue
```

### Field Value

[string](#)

## realArray

```
protected double[,] realArray
```

Field Value

[double](#) []

row

```
protected int row
```

Field Value

[int](#)

rows

```
protected string rows
```

Field Value

[string](#)

rows

```
protected int rows
```

Field Value

[int](#)

type

```
protected string type
```

Field Value

[string](#) ↗

**valueInt**

```
protected int valueInt
```

Field Value

[int](#) ↗

**valueReal**

```
protected double valueReal
```

Field Value

[double](#) ↗

## Properties

**Columns**

Dimensions of the array, 1 is default if no parameter is supplied.

```
protected int Columns { get; }
```

Property Value

[int](#) ↗

## Rows

Size of the array.

```
protected int Rows { get; }
```

Property Value

[int ↗](#)

## Methods

ArrayRestrictions()

```
public void ArrayRestrictions()
```

CheckParameters(string[])

Checks that there are 3 or 4 parameters.. [array](#) (size) (optional dimension)

```
public override void CheckParameters(string[] parameterList)
```

Parameters

[parameterList string ↗\[\]](#)

Compile()

Ensure array is correctly declared

```
public override void Compile()
```

Exceptions

[CommandException](#)

## Execute()

Evaluate any expression and store the evaluatedExpression result in instance data for sub classes.  
Expressions are evaluated at runtime by a StoredProgram object (Program)

```
public override void Execute()
```

## GetIntArray(int, int)

```
public virtual int GetIntArray(int row, int col)
```

Parameters

row [int↗](#)

col [int↗](#)

Returns

[int↗](#)

## GetRealArray(int, int)

```
public virtual double GetRealArray(int row, int col)
```

Parameters

row [int↗](#)

col [int↗](#)

Returns

[double↗](#)

## ProcessArrayParametersCompile(bool)

Peek and Poke are very similar in syntax but not identical, so processing them has to be done slightly differently.

```
protected virtual void ProcessArrayParametersCompile(bool peekOrPoke)
```

Parameters

peekOrPoke [bool](#)

Exceptions

[CommandException](#)

## ProcessArrayParametersExecute(bool)

Set up the object with parsed row and column (from any expressions). Used by Peek and Poke at runtime.

```
protected virtual void ProcessArrayParametersExecute(bool peekOrPoke)
```

Parameters

peekOrPoke [bool](#)

Exceptions

[CommandException](#)

## ReduceRestrictionCounter()

```
protected void ReduceRestrictionCounter()
```

## SetIntArray(int, int, int)

```
public virtual void SetIntArray(int val, int row, int col)
```

Parameters

val [int](#)

row [int](#)

col [int](#)

SetRealArray(double, int, int)

```
public virtual void SetRealArray(double val, int row, int col)
```

Parameters

val [double](#)

row [int](#)

col [int](#)

# Class BOOSEException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Generic BOOSE Language exception Extends Exception

```
public class BOOSEException : Exception, ISerializable
```

Inheritance

[object](#) ↗ ← [Exception](#) ↗ ← BOOSEException

Implements

[ISerializable](#) ↗

Derived

[CanvasException](#), [CommandException](#), [FactoryException](#), [ParserException](#), [RestrictionException](#),  
[StoredProgramException](#), [VarException](#)

Inherited Members

[Exception.GetBaseException\(\)](#) ↗, [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ↗,  
[Exception.GetType\(\)](#) ↗, [Exception.ToString\(\)](#) ↗, [Exception.Data](#) ↗, [Exception.HelpLink](#) ↗,  
[Exception.HResult](#) ↗, [Exception.InnerException](#) ↗, [Exception.Message](#) ↗, [Exception.Source](#) ↗,  
[Exception.StackTrace](#) ↗, [Exception.TargetSite](#) ↗, [Exception.SerializeObjectState](#) ↗,  
[object.Equals\(object\)](#) ↗, [object.Equals\(object, object\)](#) ↗, [object.GetHashCode\(\)](#) ↗,  
[object.MemberwiseClone\(\)](#) ↗, [object.ReferenceEquals\(object, object\)](#) ↗

## Constructors

### BOOSEException(string)

```
public BOOSEException(string msg)
```

Parameters

msg [string](#) ↗

# Class Boolean

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Boolean datatype, also used for Conditional Commands.

```
public class Boolean : Evaluation, ICommand
```

Inheritance

[object](#) ↗ ← [Command](#) ← [Evaluation](#) ← Boolean

Implements

[ICommand](#)

Derived

[ConditionalCommand](#)

Inherited Members

[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.CheckParameters\(string\[\]\)](#) , [Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) ,  
[Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) ,  
[Command.Name](#) , [Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) ↗ , [object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ , [object.GetType\(\)](#) ↗ ,  
[object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗

## Constructors

[Boolean\(\)](#)

```
public Boolean()
```

## Properties

# BoolValue

```
public bool BoolValue { get; set; }
```

## Property Value

[bool ↗](#)

# Methods

## Compile()

Determine if variable declaration does not have an initial value. If it doesn't set it to a standard initial value (0 for int and real for example) If it does ProcessExpression will be called to extract the right hand side of the expression.

```
public override void Compile()
```

## Execute()

base.execute() will deliver a "true" or "flase" so convert that to an actual boolean value.

```
public override void Execute()
```

## Exceptions

### [CommandException](#)

Thrown if not a valid boolean expression.

## Restrictions()

Restrict the number of variable declarations.

```
public virtual void Restrictions()
```

## Exceptions

### [RestrictionException](#)

Thrown if variable limit exceeded.

# Class Call

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Comand to call a previously defined method.

```
public class Call : CompoundCommand, ICommand
```

Inheritance

[object](#) ↳ [Command](#) ↳ [Evaluation](#) ↳ [Boolean](#) ↳ [ConditionalCommand](#) ↳ [CompoundCommand](#) ↳ [Call](#)

Implements

[ICommand](#)

Inherited Members

[CompoundCommand.CorrespondingCommand](#) , [CompoundCommand.ReduceRestrictions\(\)](#) ,  
[CompoundCommand.CheckParameters\(string\[\]\)](#) , [ConditionalCommand.endLineNumber](#) ,  
[ConditionalCommand.EndLineNumber](#) , [ConditionalCommand.Condition](#) ,  
[ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [Boolean.BoolValue](#) , [Boolean.Restrictions\(\)](#) ,  
[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
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[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Fields

methodName

```
protected string methodName
```

Field Value

[string ↗](#)

## Methods

### Compile()

Override base.compile() because a variable always has variable = expression and this is just expression.

```
public override void Compile()
```

### Exceptions

[VarException](#)

### Execute()

Called when program is executed. Determines if condition is true or false. If false then jumps to corresponding "end" command.

```
public override void Execute()
```

### Exceptions

[CommandException](#)

# Class Canvas

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Abstract class that implements CanvasInterface. See CanvasInterface documentation for what to implement. This class handles all the drawing on your system according to above ocumentation. BOOSE does not by default specify a default drawing Canvas (only this).

```
public class Canvas : ICanvas
```

Inheritance

[object](#) ← Canvas

Implements

[ICanvas](#)

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

## Constructors

Canvas()

```
public Canvas()
```

## Fields

background\_colour

```
protected Color background_colour
```

Field Value

[Color](#)

# Properties

## PenColour

Get/Set the Pencolour for next drawing operation using a native colour datatype. Cast to relevant type.

```
public virtual object PenColour { get; set; }
```

### Property Value

[object](#)

## Xpos

X position of next drawing operation.

```
public virtual int Xpos { get; set; }
```

### Property Value

[int](#)

## Ypos

Y position of next drawing position

```
public virtual int Ypos { get; set; }
```

### Property Value

[int](#)

# Methods

## Circle(int, bool)

Draw a circle at cursor position of radius.

```
public virtual void Circle(int radius, bool filled)
```

### Parameters

**radius** [int](#)

Radius of circle.

**filled** [bool](#)

If True circle is drawn filled, outline if false.

## Clear()

Fill the background in the default colour.

```
public virtual void Clear()
```

## DrawTo(int, int)

Draw a line using the current pen from the last drawingf position to the specified position and move the cursor position to the provided x,y

```
public virtual void DrawTo(int x, int y)
```

### Parameters

**x** [int](#)

specified X position.

**y** [int](#)

specified Y position.

## MoveTo(int, int)

Move the X and Y of the next drawing operation.

```
public virtual void MoveTo(int x, int y)
```

Parameters

x [int](#)

X position of cursor.

y [int](#)

Y position of cursor.

## Rect(int, int, bool)

Draw a rectangle at cursor position of width and height.

```
public virtual void Rect(int width, int height, bool filled)
```

Parameters

width [int](#)

height [int](#)

filled [bool](#)

## Rectangle(int, int, bool)

```
public virtual void Rectangle(int width, int height, bool filled)
```

Parameters

width [int](#)

height [int](#)

`filled` `bool`

## Reset()

Reset drawing cursor to 0,0 and reset pen to default.

```
public virtual void Reset()
```

## Set(int, int)

Set output display size. This method should create whatever drawing display you intend to use of the size specified.

```
public virtual void Set(int width, int height)
```

### Parameters

`width` `int`

`height` `int`

## SetColour(int, int, int)

Set the pen colour using rgb values.

```
public virtual void SetColour(int red, int green, int blue)
```

### Parameters

`red` `int`

`green` `int`

`blue` `int`

## Tri(int, int)

Draw a triangle in the bounding rectangle.

```
public virtual void Tri(int width, int height)
```

Parameters

**width** [int](#)

Width of bounding rectangle.

**height** [int](#)

Height of bounding rectangle.

## WriteText(string)

Draws text on the output window at the cursor position

```
public virtual void WriteText(string text)
```

Parameters

**text** [string](#)

String to output

## getBitmap()

Get the drawing Object of whatever native type. Returned a Object so it can be cast to native type. Use this to get native drawing type so that it can be displayed or output.

```
public virtual object getBitmap()
```

Returns

[object](#)

# Class CanvasCommand

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Derived class to add a drawing surface that implements the ICanvas interface.

```
public abstract class CanvasCommand : Command, ICommand
```

Inheritance

[object](#) ← [Command](#) ← CanvasCommand

Implements

[ICommand](#)

Derived

[CommandOneParameter](#)

Inherited Members

[Command.program](#) , [Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) ,  
[Command.CheckParameters\(string\[\]\)](#) , [Command.Program](#) , [Command.Name](#) , [Command.ParameterList](#) ,  
[Command.Parameters](#) , [Command.Paramsint](#) , [Command.Set\(StoredProgram, string\)](#) ,  
[Command.Compile\(\)](#) , [Command.Execute\(\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### CanvasCommand()

```
public CanvasCommand()
```

### CanvasCommand(ICanvas)

Check the parsed parameters match what are expected, i.e. if a command requires two parameters has it got two parameters?

```
public CanvasCommand(ICanvas c)
```

## Parameters

c [ICanvas](#)

## Fields

### canvas

```
protected ICanvas canvas
```

#### Field Value

[ICanvas](#)

### xPos

```
protected int xPos
```

#### Field Value

[int](#)

### yPos

```
protected int yPos
```

#### Field Value

[int](#)

## Properties

# Canvas

get/set Canvas object this command is associated with (useful

```
public ICanvas Canvas { get; set; }
```

Property Value

[ICanvas](#)

# Class CanvasException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Exception generated by the Canvas class.

```
public class CanvasException : BOOSEException, ISerializable
```

## Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← CanvasException

## Implements

[ISerializable](#)

## Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Constructors

## CanvasException(string)

```
public CanvasException(string msg)
```

## Parameters

msg [string](#)

# See Also

[BOOSEException](#)

# Class Cast

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Cast real values to int values.

```
public class Cast : Command, ICommand
```

Inheritance

[object](#) ↗ ← [Command](#) ← Cast

Implements

[ICommand](#)

Inherited Members

[Command.program](#) , [Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) ,  
[Command.Program](#) , [Command.Name](#) , [Command.ParameterList](#) , [Command.Parameters](#) ,  
[Command.Paramsint](#) , [Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) ,  
[Command.ToString\(\)](#) , [object.Equals\(object\)](#) ↗ , [object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ ,  
[object.GetType\(\)](#) ↗ , [object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗

## Methods

### CheckParameters(string[])

Derived commandas must provide a method to check that their parameters are ok and throw relevant exceptions if not.

```
public override void CheckParameters(string[] parameter)
```

Parameters

parameter [string](#) ↗ []

### Compile()

Called when Command added to the Program

```
public override void Compile()
```

## Execute()

Generic Execute() checks a command's parameter list and converts any variables and expressions to literal values. Should be called (base.Execute()) from derived Command classes before the derived Command uses the parameters to do its job. Derived Command should check it has the correct number of parameters and throw a CommandException if not.

```
public override void Execute()
```

# Class Circle

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Draw a circle round the current cursor position.

```
public class Circle : CommandOneParameter, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← Circle

Implements

[ICommand](#)

Inherited Members

[CommandOneParameter.param1](#) , [CommandOneParameter.param1unprocessed](#) ,  
[CanvasCommand.yPos](#) , [CanvasCommand.xPos](#) , [CanvasCommand.canvas](#) , [CanvasCommand.Canvas](#) ,  
[Command.program](#) , [Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) ,  
[Command.Program](#) , [Command.Name](#) , [Command.ParameterList](#) , [Command.Parameters](#) ,  
[Command.Paramsint](#) , [Command.Set\(StoredProgram, string\)](#) , [Command.Compile\(\)](#) ,  
[Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) , [object.Equals\(object\)](#) ,  
[object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### Circle()

blank constructor for factory instantiation.

```
public Circle()
```

### Circle(Canvas, int)

draw from current position to x, y. cursor left at x,y

```
public Circle(Canvas c, int radius)
```

Parameters

c [Canvas](#)

radius [int](#)

## Methods

**CheckParameters(string[])**

overridden generic one parameter message to say radius and not p1.

```
public override void CheckParameters(string[] parameterList)
```

Parameters

parameterList [string](#)[]

Exceptions

[CommandException](#)

**Execute()**

Execute the command

```
public override void Execute()
```

# Class Command

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Abstract class for commands with a parameter list or expression. This class will separate the parameters or expression from the command and store in the "ParameterList". The Command's Compile() method is called by the parser and this is expected to set the Command's parameters. CheckParameters

```
public abstract class Command : ICommand
```

Inheritance

[object](#) ← Command

Implements

[ICommand](#)

Derived

[CanvasCommand](#), [Cast](#), [Evaluation](#)

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### Command()

designed to be used with ProgramFactory so should not call constructor

```
public Command()
```

## Fields

### parameterList

```
protected string parameterList
```

Field Value

[string](#) ↴

parameters

```
protected string[] parameters
```

Field Value

[string](#) ↴ []

paramsint

```
protected int[] paramsint
```

Field Value

[int](#) ↴ []

program

```
protected StoredProgram program
```

Field Value

[StoredProgram](#)

## Properties

Name

returns the name type of this command as a string.

```
public string Name { get; }
```

Property Value

[string](#)

ParameterList

```
public string ParameterList { get; }
```

Property Value

[string](#)[]

Parameters

```
public string[] Parameters { get; set; }
```

Property Value

[string](#)[]

Paramsint

```
public int[] Paramsint { get; set; }
```

Property Value

[int](#)[]

Program

```
public StoredProgram Program { get; set; }
```

## Property Value

[StoredProgram](#)

## Methods

### CheckParameters(string[])

Derived commandas must provide a method to check that their parameters are ok and throw relevant exceptions if not.

```
public abstract void CheckParameters(string[] parameter)
```

### Parameters

parameter [string](#)[]

### Compile()

Called when Command added to the Program

```
public virtual void Compile()
```

### Execute()

Generic Execute() checks a command's parameter list and converts any variables and expressions to literal values Should be called (base.Execute()) from derived Command classes before the derived Command uses the parameters to do its job. Derived Command should check it has the correct number of parameters and throw a CommandException if not.

```
public virtual void Execute()
```

## ProcessParameters(string)

Converts a string containing parameters to separate parameters. Given a raw, single string parameter list, separated by commas this splits into separate strings and returns in the out Params.

```
public int ProcessParameters(string ParameterList)
```

Parameters

ParameterList [string ↗](#)

Returns

[int ↗](#)

Number of parameters

## Set(StoredProgram, string)

Set a Command Object

```
public virtual void Set(StoredProgram Program, string Params)
```

Parameters

Program [StoredProgram](#)

Reference to valid StoredProgram

Params [string ↗](#)

Original parameter list e.g. "num1,num2"

## ToString()

returns name and parameter list as a string suitable for reparsing.

```
public override string ToString()
```

Returns

[string](#) ↗

# Class CommandException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Exception generated by the StoredProgram class.

```
public class CommandException : BOOSEException, ISerializable
```

Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← CommandException

Implements

[ISerializable](#)

Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### CommandException(string)

```
public CommandException(string msg)
```

Parameters

msg [string](#)

# Class CommandFactory

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

```
public class CommandFactory : ICommandFactory
```

## Inheritance

[object](#) ← CommandFactory

## Implements

[ICommandFactory](#)

## Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

## Methods

### MakeCommand(string)

Make a Command object from the String passed. Currentlt creates moveto, drawto, circle, pen and var". To create additional commands create a Factory that iextends this class and which create a MakeCommand() to make your new commands. Call base.MakeCommand() to make the above commands. Replace the entire Factory buy impelementing the IFactory interface.

```
public virtual ICommand MakeCommand(string commandType)
```

#### Parameters

commandType [string](#)

String holding command to be created. Case is unimportant and it is trimmed.

#### Returns

[ICommand](#)

`ICommand` object if successful

## Exceptions

### [FactoryException](#)

Thrown if no such command.

# Class CommandOneParameter

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Commands with two parameters. Each command has an Xpos and Ypos that operates from the current cursor position.

```
public abstract class CommandOneParameter : CanvasCommand, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [CanvasCommand](#) ← CommandOneParameter

Implements

[ICommand](#)

Derived

[Circle](#), [CommandTwoParameters](#), [Rect](#)

Inherited Members

[CanvasCommand.yPos](#), [CanvasCommand.xPos](#), [CanvasCommand.canvas](#), [CanvasCommand.Canvas](#),  
[Command.program](#), [Command.parameterList](#), [Command.parameters](#), [Command.paramsint](#),  
[Command.Program](#), [Command.Name](#), [Command.ParameterList](#), [Command.Parameters](#),  
[Command.Paramsint](#), [Command.Set\(StoredProgram, string\)](#), [Command.Compile\(\)](#),  
[Command.Execute\(\)](#), [Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#),  
[object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#), [object.GetType\(\)](#),  
[object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Constructors

CommandOneParameter()

```
public CommandOneParameter()
```

CommandOneParameter(Canvas)

Immediate execute move drawing cursor to x, y

```
public CommandOneParameter(Canvas c)
```

## Parameters

c [Canvas](#)

## Fields

### param1

```
protected int param1
```

#### Field Value

[int](#)

### param1unprocessed

```
protected string param1unprocessed
```

#### Field Value

[string](#)

## Methods

### CheckParameters(string[])

Attempt to get two integer parameters throw applicationException if not

```
public override void CheckParameters(string[] parameterList)
```

## Parameters

parameterList [string](#)[]

# Class CommandThreeParameters

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Commands with two parameters. Each command has an Xpos and Ypos that operates from the current cursor position.

```
public abstract class CommandThreeParameters : CommandTwoParameters, ICommand
```

## Inheritance

[object](#) ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← [CommandTwoParameters](#) ← [CommandThreeParameters](#)

## Implements

[ICommand](#)

## Derived

[PenColour](#)

## Inherited Members

[CommandTwoParameters.param2](#), [CommandTwoParameters.param2unprocessed](#),  
[CommandOneParameter.param1](#), [CommandOneParameter.param1unprocessed](#),  
[CanvasCommand.yPos](#), [CanvasCommand.xPos](#), [CanvasCommand.canvas](#), [CanvasCommand.Canvas](#),  
[Command.program](#), [Command.parameterList](#), [Command.parameters](#), [Command.paramsint](#),  
[Command.Program](#), [Command.Name](#), [Command.ParameterList](#), [Command.Parameters](#),  
[Command.Paramsint](#), [Command.Set\(StoredProgram, string\)](#), [Command.Compile\(\)](#),  
[Command.Execute\(\)](#), [Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#),  
[object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#), [object.GetType\(\)](#),  
[object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Constructors

[CommandThreeParameters\(\)](#)

```
public CommandThreeParameters()
```

# CommandThreeParameters(Canvas)

Immediate execute move drawing cursor to x, y

```
public CommandThreeParameters(Canvas c)
```

Parameters

c [Canvas](#)

## Fields

param3

```
protected int param3
```

Field Value

[int](#)

param3unprocessed

```
protected string param3unprocessed
```

Field Value

[string](#)

## Methods

CheckParameters(string[])

Attempt to get two integer parameters throw applicationException if not

```
public override void CheckParameters(string[] parameterList)
```

## Parameters

parameterList [string](#)[]

# Class CommandTwoParameters

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Commands with two parameters. Each command has an Xpos and Ypos that operates from the current cursor position.

```
public abstract class CommandTwoParameters : CommandOneParameter, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← [CommandTwoParameters](#)

Implements

[ICommand](#)

Derived

[CommandThreeParameters](#), [DrawTo](#), [MoveTo](#)

Inherited Members

[CommandOneParameter.param1](#), [CommandOneParameter.param1unprocessed](#),  
[CanvasCommand.yPos](#), [CanvasCommand.xPos](#), [CanvasCommand.canvas](#), [CanvasCommand.Canvas](#),  
[Command.program](#), [Command.parameterList](#), [Command.parameters](#), [Command.paramsint](#),  
[Command.Program](#), [Command.Name](#), [Command.ParameterList](#), [Command.Parameters](#),  
[Command.Paramsint](#), [Command.Set\(StoredProgram, string\)](#), [Command.Compile\(\)](#),  
[Command.Execute\(\)](#), [Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#),  
[object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#), [object.GetType\(\)](#),  
[object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Constructors

### CommandTwoParameters()

```
public CommandTwoParameters()
```

### CommandTwoParameters(Canvas)

Immediate execute move drawing cursor to x, y

```
public CommandTwoParameters(Canvas c)
```

Parameters

c [Canvas](#)

## Fields

param2

```
protected int param2
```

Field Value

[int](#)

param2unprocessed

```
protected string param2unprocessed
```

Field Value

[string](#)

## Methods

CheckParameters(string[])

Attempt to get two integer parameters throw applicationException if not

```
public override void CheckParameters(string[] parameterList)
```

## Parameters

parameterList [string](#)[]

# Class CompoundCommand

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

CompoundCommand is a building block for shared functionality between CompoundCommands, such as ELSE and ENDS

```
public class CompoundCommand : ConditionalCommand, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← [Boolean](#) ← [ConditionalCommand](#) ← [CompoundCommand](#)

Implements

[ICommand](#)

Derived

[Call](#), [Else](#), [End](#), [If](#), [Method](#), [While](#)

Inherited Members

[ConditionalCommand.endLineNumber](#), [ConditionalCommand.EndLineNumber](#),  
[ConditionalCommand.Condition](#), [ConditionalCommand.LineNumber](#), [ConditionalCommand.CondType](#),  
[ConditionalCommand.ReturnLineNumber](#), [ConditionalCommand.Execute\(\)](#), [Boolean.BoolValue](#),  
[Boolean.Restrictions\(\)](#), [Evaluation.expression](#), [Evaluation.evaluatedExpression](#), [Evaluation.varName](#),  
[Evaluation.value](#), [Evaluation.Expression](#), [Evaluation.VarName](#), [Evaluation.Value](#), [Evaluation.Local](#),  
[Evaluation.ProcessExpression\(string\)](#), [Command.program](#), [Command.parameterList](#),  
[Command.parameters](#), [Command.paramsint](#), [Command.Program](#), [Command.Name](#),  
[Command.ParameterList](#), [Command.Parameters](#), [Command.Parmsint](#),  
[Command.Set\(StoredProgram, string\)](#), [Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#),  
[object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#), [object.GetType\(\)](#),  
[object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Constructors

[CompoundCommand\(\)](#)

```
public CompoundCommand()
```

# Properties

## CorrespondingCommand

```
public ConditionalCommand CorrespondingCommand { get; set; }
```

### Property Value

[ConditionalCommand](#)

# Methods

## CheckParameters(string[])

Does nothing in this case.

```
public override void CheckParameters(string[] parameter)
```

### Parameters

parameter [string](#)[]

## Compile()

Override base.compile() because a variable always has variable = expression and this is just expression.

```
public override void Compile()
```

### Exceptions

[VarException](#)

## ReduceRestrictions()

```
protected void ReduceRestrictions()
```



# Class ConditionalCommand

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Extends Var because it has an expression, only this time it directly affects execution.

```
public class ConditionalCommand : Boolean, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← [Boolean](#) ← ConditionalCommand

Implements

[ICommand](#)

Derived

[CompoundCommand](#), [For](#)

Inherited Members

[Boolean.BoolValue](#), [Boolean.Restrictions\(\)](#), [Evaluation.expression](#), [Evaluation.evaluatedExpression](#),  
[Evaluation.varName](#), [Evaluation.value](#), [Evaluation.Expression](#), [Evaluation.VarName](#), [Evaluation.Value](#),  
[Evaluation.Local](#), [Evaluation.CheckParameters\(string\[\]\)](#), [Evaluation.ProcessExpression\(string\)](#),  
[Command.program](#), [Command.parameterList](#), [Command.parameters](#), [Command.paramsint](#),  
[Command.Program](#), [Command.Name](#), [Command.ParameterList](#), [Command.Parameters](#),  
[Command.Paramsint](#), [Command.Set\(StoredProgram, string\)](#), [Command.ProcessParameters\(string\)](#),  
[Command.ToString\(\)](#), [object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#),  
[object.GetType\(\)](#), [object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Fields

endLineNumber

```
protected int endLineNumber
```

Field Value

[int](#)

# Properties

## CondType

Link end [type of conditional] to conditional, so compiler can tell if end end does not match

```
public ConditionalCommand.conditionalTypes CondType { get; set; }
```

## Property Value

[ConditionalCommand.conditionalTypes](#)

## Condition

Condition for If and While.

```
public bool Condition { get; set; }
```

## Property Value

[bool](#)

## EndLineNumber

Line number of corresponding "end" command for this conditional command (so when executed it can jump straight to it).

```
public int EndLineNumber { get; set; }
```

## Property Value

[int](#)

## LineNumber

Line number of this conditional command.

```
public int LineNumber { get; set; }
```

Property Value

[int ↗](#)

ReturnLineNumber

```
public int ReturnLineNumber { get; set; }
```

Property Value

[int ↗](#)

## Methods

Compile()

Override base.compile() because a variable always has variable = expression and this is just expression.

```
public override void Compile()
```

Exceptions

[VarException](#)

Execute()

Called when program is executed. Determines if condition is true or false. If false then jumps to corresponding "end" command.

```
public override void Execute()
```

Exceptions

## CommandException

# Enum ConditionalCommand.conditionalTypes

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Enumerated type to represent individual conditional commands.

```
public enum ConditionalCommand.conditionalTypes
```

## Fields

commFor = 2

commIF = 0

commWhile = 1

# Class DrawTo

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Draw a line from to current cursor position to the provided x,y position.

```
public class DrawTo : CommandTwoParameters, ICommand
```

## Inheritance

[object](#) ↗ ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← [CommandTwoParameters](#) ← DrawTo

## Implements

[ICommand](#)

## Inherited Members

[CommandTwoParameters.param2](#) , [CommandTwoParameters.param2unprocessed](#) ,  
[CommandTwoParameters.CheckParameters\(string\[\]\)](#) , [CommandOneParameter.param1](#) ,  
[CommandOneParameter.param1unprocessed](#) , [CanvasCommand.yPos](#) , [CanvasCommand.xPos](#) ,  
[CanvasCommand.canvas](#) , [CanvasCommand.Canvas](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.Compile\(\)](#) , [Command.ProcessParameters\(string\)](#) ,  
[Command.ToString\(\)](#) , [object.Equals\(object\)](#) ↗ , [object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ ,  
[object.GetType\(\)](#) ↗ , [object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗

# Constructors

## DrawTo()

blank constructor for factory instantiation.

```
public DrawTo()
```

## DrawTo(Canvas, int, int)

draw from current position to x, y. cursor left at x,y

```
public DrawTo(Canvas c, int x, int y)
```

## Parameters

c [Canvas](#)

x [int](#)

x position

y [int](#)

y position

## Methods

### Execute()

Execute the command

```
public override void Execute()
```

# Class Else

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

An Else is like an Endif but it pops the corresponding If off the stack and pushes itself on so that it becomes the corresponding command to the end

```
public class Else : CompoundCommand, ICommand
```

Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← [Boolean](#) ← [ConditionalCommand](#) ← [CompoundCommand](#) ← Else

Implements

[ICommand](#)

Inherited Members

[CompoundCommand.CorrespondingCommand](#) , [CompoundCommand.ReduceRestrictions\(\)](#) ,  
[ConditionalCommand.endLineNumber](#) , [ConditionalCommand.EndLineNumber](#) ,  
[ConditionalCommand.Condition](#) , [ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [Boolean.BoolValue](#) , [Boolean.Restrictions\(\)](#) ,  
[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

Else()

```
public Else()
```

# Properties

## CorrespondingEnd

```
public End CorrespondingEnd { get; set; }
```

### Property Value

[End](#)

# Methods

## CheckParameters(string[])

Does nothing in this case.

```
public override void CheckParameters(string[] parameter)
```

### Parameters

parameter [string](#)[]

## Compile()

Override base.compile() because a variable always has variable = expression and this is just expression.

```
public override void Compile()
```

### Exceptions

[VarException](#)

## Execute()

Called when program is executed. Determines if condition is true or false. If false then jumps to corresponding "end" command.

```
public override void Execute()
```

## Exceptions

[CommandException](#)

# Class End

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

End command for If/While/For/Method. BOOSE has only one End type command which has a parameter to say what it belongs so eg. "end if". End checks Boose types for the corresponding command (If/While/For/Method) and will likely require a complete rewrite to replace those commands. It would probably be easier to replace Parser, StoredProgram, CompoundCommand and this. Look at the methods each provides, if you like, and try and fill in their functionality.

```
public class End : CompoundCommand, ICommand
```

## Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← [Boolean](#) ← [ConditionalCommand](#) ← [CompoundCommand](#) ← End

## Implements

[ICommand](#)

## Inherited Members

[CompoundCommand.CorrespondingCommand](#) , [CompoundCommand.ReduceRestrictions\(\)](#) ,  
[CompoundCommand.CheckParameters\(string\[\]\)](#) , [ConditionalCommand.endLineNumber](#) ,  
[ConditionalCommand.EndLineNumber](#) , [ConditionalCommand.Condition](#) ,  
[ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [Boolean.BoolValue](#) , [Boolean.Restrictions\(\)](#) ,  
[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Constructors

## End()

```
public End()
```

## Methods

### Compile()

Checks that this end matches the last condition (i.e. if this is an end if then the command it pops off the stack is an "if".

```
public override void Compile()
```

### Exceptions

#### [CommandException](#)

Thrown if the corresponding command does not match.

### Execute()

Ifs are simple, do nothing. Whiles jumps back to the corresponding while command and For gets the from, to and step, checks they will result in a loop and determines whether the count has run out. If it hasn't it jumps to the line after the for.

```
public override void Execute()
```

### Exceptions

#### [CommandException](#)

Thrown if invalid for loop.

# Class Evaluation

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

An evaluation encompasses all things that can have a value, such as variables, expressions and conditions used in loops and ifs.

```
public class Evaluation : Command, ICommand
```

Inheritance

[object](#) ← [Command](#) ← Evaluation

Implements

[ICommand](#)

Derived

[Array](#), [Boolean](#), [Int](#), [Real](#), [Write](#)

Inherited Members

[Command.program](#), [Command.parameterList](#), [Command.parameters](#), [Command.paramsint](#),  
[Command.Program](#), [Command.Name](#), [Command.ParameterList](#), [Command.Parameters](#),  
[Command.Paramsint](#), [Command.Set\(StoredProgram, string\)](#), [Command.ProcessParameters\(string\)](#),  
[Command.ToString\(\)](#), [object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#),  
[object.GetType\(\)](#), [object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

## Constructors

### Evaluation()

Blank constructor,

```
public Evaluation()
```

## Fields

### evaluatedExpression

```
protected string evaluatedExpression
```

Field Value

[string](#) ↗

**expression**

```
protected string expression
```

Field Value

[string](#) ↗

**value**

```
protected int value
```

Field Value

[int](#) ↗

**varName**

```
protected string varName
```

Field Value

[string](#) ↗

## Properties

Expression

The right hand side of an expression in a variable initialisation or variable change of value, or a boolean in a conditional command

```
public string Expression { get; set; }
```

Property Value

[string ↗](#)

Local

Is this a local variable/method variable? This is so that variables of the same name can exist in different scopes.

```
public bool Local { get; set; }
```

Property Value

[bool ↗](#)

Value

Value of variable once the expression has been calculated. Virtual so that variables of other types can override it.

```
public virtual int Value { get; set; }
```

Property Value

[int ↗](#)

VarName

Name of variable as a string (as opposed to Name which is the name of the class, such as Int, Real or Boolean).

```
public string VarName { get; set; }
```

## Property Value

[string](#)

## Methods

### CheckParameters(string[])

Does nothing in this case.

```
public override void CheckParameters(string[] parameterList)
```

#### Parameters

parameterList [string](#)[]

### Compile()

Determine if variable declaration does not have an initial value. If it doesn't set it to a standard initial value (0 for int and real for example) If it does ProcessExpression will be called to extract the right hand side of the expression.

```
public override void Compile()
```

### Execute()

Evaluate any expression and store the evaluatedExpression result in instance data for sub classes.  
Expressions are evaluated at runtime by a StoredProgram object (Program)

```
public override void Execute()
```

## ProcessExpression(string)

Takes a complete expression with left hand side and right hand side and returns only the right hand side (i.e. the bit after the =).

```
public virtual string ProcessExpression(string Expression)
```

Parameters

[Expression](#) [string](#) ↗

Expression to evaluate

Returns

[string](#) ↗

Right hand side of expression (the bit after the =)

Exceptions

[VarException](#)

Var exception if it isn't an expression

# Class FactoryException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

exception generated by the StoredProgram class

```
public class FactoryException : BOOSEException, ISerializable
```

Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← FactoryException

Implements

[ISerializable](#)

Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### FactoryException(string)

```
public FactoryException(string msg)
```

Parameters

msg [string](#)

# Class For

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

For command. Adds processing at compile() and execute() to process a for command.

```
public class For : ConditionalCommand, ICommand
```

## Inheritance

[object](#) ↳ [Command](#) ↳ [Evaluation](#) ↳ [Boolean](#) ↳ [ConditionalCommand](#) ↳ For

## Implements

[ICommand](#)

## Inherited Members

[ConditionalCommand.endLineNumber](#) , [ConditionalCommand.EndLineNumber](#) ,  
[ConditionalCommand.Condition](#) , [ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [Boolean.BoolValue](#) , [Boolean.Restrictions\(\)](#) ,  
[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.CheckParameters\(string\[\]\)](#) , [Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) ,  
[Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) ,  
[Command.Name](#) , [Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) ↳ , [object.Equals\(object, object\)](#) ↳ , [object.GetHashCode\(\)](#) ↳ , [object.GetType\(\)](#) ↳ ,  
[object.MemberwiseClone\(\)](#) ↳ , [object.ReferenceEquals\(object, object\)](#) ↳

# Properties

## From

Where counting starts.

```
public int From { get; set; }
```

## Property Value

[int ↗](#)

## LoopControlV

For loop uses a variable to do its counting.

```
public Evaluation LoopControlV { get; }
```

Property Value

[Evaluation](#)

## Step

What do do each count. If none is specified it is set to +1t.

```
public int Step { get; set; }
```

Property Value

[int ↗](#)

## To

Where counting ends.

```
public int To { get; set; }
```

Property Value

[int ↗](#)

## Methods

Compile()

Takes the standard parameter list and extracts the LCV name, "from","to" and "step". If the LCV does not exists then it creates it. Otherwise it gets it from the variable table.

```
public override void Compile()
```

## Execute()

Evaluate the from, to and step (as they could be variables). Update the LCV value.

```
public override void Execute()
```

## Exceptions

[StoredProgramException](#)

Thrown if problem with expression.

# Interface ICanvas

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Implement ICanvas for your BOOSE renderer. It has an Xpos and Ypos of the current cursor position, and a pen colour. Your class should implement the methods below to draw on its "bitmap" (i.e. it may not be a bitmap, it could draw in ASCII text for example).

```
public interface ICanvas
```

## Properties

### PenColour

Get/Set the Pencolour for next drawing operation using a native colour datatype. Cast to relevant type.

```
object PenColour { get; set; }
```

### Property Value

[object](#)

### Xpos

X position of next drawing operation.

```
int Xpos { get; set; }
```

### Property Value

[int](#)

### Ypos

Y position of next drawing position

```
int Ypos { get; set; }
```

Property Value

[int ↗](#)

## Methods

### Circle(int, bool)

Draw a circle at cursor position of radius.

```
void Circle(int radius, bool filled)
```

Parameters

**radius** [int ↗](#)

Radius of circle.

**filled** [bool ↗](#)

If True circle is drawn filled, outline if false.

### Clear()

Fill the background in the default colour.

```
void Clear()
```

### DrawTo(int, int)

Draw a line using the current pen from the last drawingf position to the specified position and move the cursor position to the provided x,y

```
void DrawTo(int x, int y)
```

## Parameters

x [int](#)

specified X position.

y [int](#)

specified Y position.

## MoveTo(int, int)

Move the X and Y of the next drawing operation.

```
void MoveTo(int x, int y)
```

## Parameters

x [int](#)

X position of cursor.

y [int](#)

Y position of cursor.

## Rect(int, int, bool)

Draw a rectangle at cursor position of width and height.

```
void Rect(int width, int height, bool filled)
```

## Parameters

width [int](#)

height [int](#)

`filled` `bool`

## Reset()

Reset drawing cursor to 0,0 and reset pen to default.

`void Reset()`

## Set(int, int)

Set output display size. This method should create whatever drawing display you intend to use of the size specified.

`void Set(int width, int height)`

### Parameters

`width` `int`

`height` `int`

## SetColour(int, int, int)

Set the pen colour using rgb values.

`void SetColour(int red, int green, int blue)`

### Parameters

`red` `int`

`green` `int`

`blue` `int`

## Tri(int, int)

Draw a triangle in the bounding rectangle.

```
void Tri(int width, int height)
```

Parameters

**width** [int](#)

Width of bounding rectangle.

**height** [int](#)

Height of bounding rectangle.

## WriteText(string)

Draws text on the output window at the cursor position

```
void WriteText(string text)
```

Parameters

**text** [string](#)

String to output

## getBitmap()

Get the drawing Object of whatever native type. Returned a Object so it can be cast to native type. Use this to get native drawing type so that it can be displayed or output.

```
object getBitmap()
```

Returns

[object](#)

# Interface ICommand

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Interface for new commands. Any new Command class should implement this interface and be generated by a CommandFactory that implements the ICommandFactory interface. Contains methods to set the Command up after its creation, manage its parameters when it is compiled and execute it when it is called.

```
public interface ICommand
```

## Methods

### CheckParameters(string[])

Checks that a Command has the right number of parameters and throws a CommandException if not.

```
void CheckParameters(string[] Parameters)
```

Parameters

Parameters [string](#)[]

### Compile()

Called before the command is run.

```
void Compile()
```

### Execute()

Called to run the command.

```
void Execute()
```

## Set(StoredProgram, string)

Set a Command Object

```
void Set(StoredProgram Program, string Params)
```

### Parameters

Program [StoredProgram](#)

Reference to valid StoredProgram

Params [string](#) ↗

Original parameter list e.g. "num1,num2"

# Interface ICommandFactory

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

To add commands to BOOSE you must create a CommandFactory that uses this interface. You should extend the existing BOOSE:CommandFactory (which implements this interface) and then implement the MakeCommand() method. It should create a new command object based on the string passed. Any standard BOOSE commands can then be made by calling base.MakeCommand();

```
public interface ICommandFactory
```

## Methods

### MakeCommand(string)

Make a BOOSE Command based on the string passed to it.

```
ICommand MakeCommand(string commandType)
```

#### Parameters

commandType [string](#) ↗

#### Returns

[ICommand](#)

Reference to new Command object.

# Interface IEvaluation

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

IEvaluation adds properties to get and set an Evaluations name, value and expression. An evaluation can be a variable declaration, such as "int total" or "real area". It can be change of value of a variable, such as "total = total + 1", the part after the "=" is an referred to as an "expression". In the first two cases the parser will generate an Int object and a Real Object. In the third case it will generate a "Evaluation" object.

```
public interface IEvaluation : ICommand
```

## Inherited Members

[ICommand.Set\(StoredProgram, string\)](#) ,  [ICommand.Compile\(\)](#) ,  [ICommand.Execute\(\)](#) ,  
 [ICommand.CheckParameters\(string\[\]\)](#)

## Properties

### Expression

```
string Expression { get; set; }
```

#### Property Value

[string](#) ↗

### Value

```
object Value { get; set; }
```

#### Property Value

[object](#) ↗

## VarName

```
string VarName { get; set; }
```

Property Value

[string](#) ↗

# Interface IParser

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

The Parser Class takes a BOOSE program as a String with each command seperated by '\n' and creates command objects for each valid command and stores them in the passed in StoredProgram. Exceptions are generated for any syntax errors. When each valid command is generated its Compile() method is called. The valid command will have its parameters processed and any variables identified. It is the role of StoredProgram to run the commands.

```
public interface IParser
```

## Methods

### ParseCommand(string)

Parse a single command. Takes a single line of a BOOSE program "-command- -parameterlist-" or "-variable- = -expression-" It seperates the command from the parameter list or the variable from the expression. An Object of the command is made. its parameter list/expression is set and its Compile() method is called.

```
ICommand ParseCommand(string Line)
```

#### Parameters

**Line** [string](#)

"-command- -parameterlist-" or "-variable- = -expression-"

#### Returns

[ICommand](#)

ICommand Object which can then be executed

## ParseProgram(string)

Parse the entire program, adding valid command objects to the StoredProgram. An errorlist string is generated containing any syntax error messages.

```
void ParseProgram(string program)
```

### Parameters

program [string](#)

big string of a complete program separated by newlines

# Interface IStoredProgram

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

```
public interface IStoredProgram
```

## Properties

### PC

property for int pc the program counter

```
int PC { get; set; }
```

## Property Value

[int](#)

## Methods

### Add(Command)

adds Command to program, calls Command.compile() Any new command needs to implement a compile() method which will be called here when the command is compiled and added.

```
int Add(Command C)
```

## Parameters

C [Command](#)

## Returns

[int](#)

index at which member was added

## AddVariable(Evaluation)

Add a Var object to the StoredProgram.

```
void AddVariable(Evaluation Variable)
```

Parameters

[Variable](#) [Evaluation](#)

## Commandsleft()

Are there any commands left to execute in the program? i.e. pc (Program Counter) has not yet reached the end of the program

```
bool Commandsleft()
```

Returns

[bool](#) ↗

true if commands left to execute, false if the end has been reached

## EvaluateExpression(string)

Evaluate the given expression by finding the values of any variables and passing the result as a String

```
string EvaluateExpression(string Exp)
```

Parameters

[Exp](#) [string](#) ↗

Returns

[string](#)

## Exceptions

### [StoredProgramException](#)

Throws StoredProgramException if it cannot be evaluated. Use IsExpression() before calling to prevent this exception being thrown.

## GetVarValue(string)

Return the String value of a variable. It should throw a StoredProgramException if attempt is made to retrieve a non-existent variable. i.e. don't try, check first.

```
string GetVarValue(string varName)
```

## Parameters

varName [string](#)

## Returns

[string](#)

## IsExpression(string)

Determine if the passed in string is an evalutable expression.

```
bool IsExpression(string expression)
```

## Parameters

expression [string](#)

Expression to be tested.

## Returns

[bool](#)

true is it is an expression.

## ResetProgram()

Once a program has finished executing it needs to be reset (Program Counter set to zero)

```
void ResetProgram()
```

## Run()

Attempt to execute the program, throws a StoredProgram if it cannot run. The parser object should have generated a runnable program before running.

```
void Run()
```

## Exceptions

[StoredProgramException](#)

## VariableExists(string)

Returns true if variable has been defined in this program, false if not.

```
bool VariableExists(string varName)
```

## Parameters

varName [string](#)

## Returns

[bool](#)

True if variable exists.

# Class If

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

If command. Adds processing at compile() and execute() to process an if command.

```
public class If : CompoundCommand, ICommand
```

## Inheritance

[object](#) ↳ [Command](#) ↳ [Evaluation](#) ↳ [Boolean](#) ↳ [ConditionalCommand](#) ↳ [CompoundCommand](#) ↳ If

## Implements

[ICommand](#)

## Inherited Members

[CompoundCommand.CorrespondingCommand](#) , [CompoundCommand.ReduceRestrictions\(\)](#) ,  
[CompoundCommand.CheckParameters\(string\[\]\)](#) , [CompoundCommand.Compile\(\)](#) ,  
[ConditionalCommand.endLineNumber](#) , [ConditionalCommand.EndLineNumber](#) ,  
[ConditionalCommand.Condition](#) , [ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [ConditionalCommand.Execute\(\)](#) , [Boolean.BoolValue](#) ,  
[Boolean.Restrictions\(\)](#) , [Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) ,  
[Evaluation.value](#) , [Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Class Int

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Command Class to define and store integer values.

```
public class Int : Evaluation, ICommand
```

Inheritance

[object](#) ↳ [Command](#) ↳ [Evaluation](#) ↳ [Int](#)

Implements

[ICommand](#)

Inherited Members

[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.CheckParameters\(string\[\]\)](#) , [Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) ,  
[Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) ,  
[Command.Name](#) , [Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) ↳ , [object.Equals\(object, object\)](#) ↳ , [object.GetHashCode\(\)](#) ↳ , [object.GetType\(\)](#) ↳ ,  
[object.MemberwiseClone\(\)](#) ↳ , [object.ReferenceEquals\(object, object\)](#) ↳

## Constructors

[Int\(\)](#)

Constructor calls restrictions.

```
public Int()
```

## Methods

[Compile\(\)](#)

If this is a variable declaration set its value and add it to the variable table in the StoredProgram. If it is an expression then nothing happens as it already exists in the variable table (that is handled within StoredProgram).

```
public override void Compile()
```

## Execute()

Base calculates a string evaluated expression. Now see if it's an integer value. Determines if a cast is needed for a real value.

```
public override void Execute()
```

## Exceptions

### [StoredProgramException](#)

Throws an exception if it can't parse an integer or if there is an attempt to parse a real value which requires a boose cast to force it.

## Restrictions()

Restrict the number of variable declarations.

```
public virtual void Restrictions()
```

## Exceptions

### [RestrictionException](#)

Thrown if variable limit exceeded.

# Class Method

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Method declaration command. Overcoming method restrictions will require a complete rewrite. It would be simpler to do this after Parser and StoredProgram. You are getting to the stage where you need to do a big rewrite.

```
public class Method : CompoundCommand, ICommand
```

## Inheritance

[object](#) ↳ ← [Command](#) ← [Evaluation](#) ← [Boolean](#) ← [ConditionalCommand](#) ← [CompoundCommand](#) ←  
Method

## Implements

[ICommand](#)

## Inherited Members

[CompoundCommand.CorrespondingCommand](#) , [CompoundCommand.ReduceRestrictions\(\)](#) ,  
[ConditionalCommand.endLineNumber](#) , [ConditionalCommand.EndLineNumber](#) ,  
[ConditionalCommand.Condition](#) , [ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [Boolean.BoolValue](#) , [Boolean.Restrictions\(\)](#) ,  
[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) ↳ , [object.Equals\(object, object\)](#) ↳ , [object.GetHashCode\(\)](#) ↳ , [object.GetType\(\)](#) ↳ ,  
[object.MemberwiseClone\(\)](#) ↳ , [object.ReferenceEquals\(object, object\)](#) ↳

# Constructors

## Method()

```
public Method()
```

# Properties

## LocalVariables

Get parameter list of the method, treated as local variable. They will be deleted when execution leave the method.

```
public string[] LocalVariables { get; }
```

## Property Value

[string](#)[]

## MethodName

Get method name, so a parser can append it to local variables/parameters.

```
public string MethodName { get; }
```

## Property Value

[string](#)[]

## Type

Return type of method

```
public string Type { get; }
```

## Property Value

[string](#)[]

# Methods

## CheckParameters(string[])

Does nothing in this case.

```
public override void CheckParameters(string[] parameter)
```

Parameters

parameter string[]

## Compile()

Override base.compile() because a variable always has variable = expression and this is just expression.

```
public override void Compile()
```

Exceptions

VarException

## Execute()

Called when program is executed. Determines if condition is true or false. If false then jumps to corresponding "end" command.

```
public override void Execute()
```

Exceptions

CommandException

# Class MoveTo

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Set the cursor position, for subsequent drawing operations, to the provide x,y position.

```
public class MoveTo : CommandTwoParameters, ICommand
```

## Inheritance

[object](#) ↗ ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← [CommandTwoParameters](#) ← MoveTo

## Implements

[ICommand](#)

## Inherited Members

[CommandTwoParameters.param2](#) , [CommandTwoParameters.param2unprocessed](#) ,  
[CommandTwoParameters.CheckParameters\(string\[\]\)](#) , [CommandOneParameter.param1](#) ,  
[CommandOneParameter.param1unprocessed](#) , [CanvasCommand.yPos](#) , [CanvasCommand.xPos](#) ,  
[CanvasCommand.canvas](#) , [CanvasCommand.Canvas](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.Compile\(\)](#) , [Command.ProcessParameters\(string\)](#) ,  
[Command.ToString\(\)](#) , [object.Equals\(object\)](#) ↗ , [object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ ,  
[object.GetType\(\)](#) ↗ , [object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗

# Constructors

## MoveTo()

Blank constructor for factory instantiation.

```
public MoveTo()
```

# Methods

## Execute()

Execute the moveto command, if sucessful the drawing cursor will be moved to the passed in x,y position.

```
public override void Execute()
```

# Class Parser

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

The parser takes a program, who's lines are separated by "\n", and attempts to create a StoredProgram. Once the StoredProgram has been created it then can be run. As much processing that can be done is done here because it has no run penalty (other than starting the program). Command objects are created and their parameters processed as much as possible. Variables are checked for existence but expressions cannot be processed until runtime.

```
public class Parser : IParser
```

## Inheritance

[object](#) ← Parser

## Implements

[IParser](#)

## Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

# Constructors

## Parser(CommandFactory, StoredProgram)

Create Parser object with associated StoredProgram.

```
public Parser(CommandFactory Factory, StoredProgram Program)
```

## Parameters

### Factory [CommandFactory](#)

CommandFactory that the parser will call to make command objects..

### Program [StoredProgram](#)

StoredProgram to add generated commands to.

## Exceptions

### [ParserException](#)

Thrown on syntax errors. message contains a complete list with line numbers, seperated by return characters.

## Methods

### ParseCommand(string)

Take a line and attempt to parse a BOOSE command. The command is split from its parameters. It determines if variables are being defined or updated. The Command Factory is called to make the Command object and its Compile() method is called to further process its parameters. Normal commands are of the form [command][space][parameter list] Variable declarations\redefinitions are of the form [variablename]=[expression] where expression is optional. To create your own parser it would be possible to just implement the IParser interface. You could extend Parser as well.

```
public virtual ICommand ParseCommand(string Line)
```

#### Parameters

##### [Line string](#)

#### Returns

##### [ICommand](#)

#### Exceptions

### [ParserException](#)

Throws exceptions if an undefined variable is used in an expression.

### ParseProgram(string)

The whole program is processed line by line. ParseCommand() is called for each line.

```
public virtual void ParseProgram(string program)
```

## Parameters

program [string](#)

## Exceptions

[ParserException](#)

Complete list of syntax errors with line numbers.

# Class ParserException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

exception generated by the Parser class to denote syntax errors

```
public class ParserException : BOOSEException, ISerializable
```

Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← ParserException

Implements

[ISerializable](#)

Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### ParserException(string)

```
public ParserException(string msg)
```

Parameters

msg [string](#)

# Class Peek

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Peek an array, i.e. get the value of an array cell. [variable] = peek [array name] [row] [optional column]

```
public class Peek : Array, ICommand
```

## Inheritance

[object](#) ↳ [Command](#) ↳ [Evaluation](#) ↳ [Array](#) ↳ [Peek](#)

## Implements

[ICommand](#)

## Inherited Members

[Array.PEEK](#), [Array.POKE](#), [Array.type](#), [Array.rows](#), [Array.columns](#), [Array.valueInt](#), [Array.valueReal](#),  
[Array.intArray](#), [Array.realArray](#), [Array.pokeValue](#), [Array.peekVar](#), [Array.rowS](#), [Array.columnS](#), [Array.row](#),  
[Array.column](#), [Array.Rows](#), [Array.Columns](#), [Array.ArrayRestrictions\(\)](#), [Array.ReduceRestrictionCounter\(\)](#),  
[Array.ProcessArrayParametersCompile\(bool\)](#), [Array.ProcessArrayParametersExecute\(bool\)](#),  
[Array.SetIntArray\(int, int, int\)](#), [Array.SetRealArray\(double, int, int\)](#), [Array.GetIntArray\(int, int\)](#),  
[Array.GetRealArray\(int, int\)](#), [Evaluation.expression](#), [Evaluation.evaluatedExpression](#),  
[Evaluation.varName](#), [Evaluation.value](#), [Evaluation.Expression](#), [Evaluation.VarName](#), [Evaluation.Value](#),  
[Evaluation.Local](#), [Evaluation.ProcessExpression\(string\)](#), [Command.program](#), [Command.parameterList](#),  
[Command.parameters](#), [Command.paramsint](#), [Command.Program](#), [Command.Name](#),  
[Command.ParameterList](#), [Command.Parameters](#), [Command.Paramsint](#),  
[Command.Set\(StoredProgram, string\)](#), [Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#),  
[object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#), [object.GetType\(\)](#),  
[object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#)

# Constructors

## Peek()

```
public Peek()
```

# Methods

## CheckParameters(string[])

Checks that there are 3 or 4 parameters.. [array](#) (size) (optional dimension)

```
public override void CheckParameters(string[] Parameters)
```

Parameters

Parameters [string](#)[]

## Compile()

Ensure array is correctly declared

```
public override void Compile()
```

Exceptions

[CommandException](#)

## Execute()

Evaluate any expression and store the evaluatedExpression result in instance data for sub classes.  
Expressions are evaluated at runtime by a StoredProgram object (Program)

```
public override void Execute()
```

# Class PenColour

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Set the pen for the next drawing operations to the provided r,g,b colour.

```
public class PenColour : CommandThreeParameters, ICommand
```

## Inheritance

[object](#) ↗ ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← [CommandTwoParameters](#) ← [CommandThreeParameters](#) ← PenColour

## Implements

[ICommand](#)

## Inherited Members

[CommandThreeParameters.param3](#) , [CommandThreeParameters.param3unprocessed](#) ,  
[CommandThreeParameters.CheckParameters\(string\[\]\)](#) , [CommandTwoParameters.param2](#) ,  
[CommandTwoParameters.param2unprocessed](#) , [CommandOneParameter.param1](#) ,  
[CommandOneParameter.param1unprocessed](#) , [CanvasCommand.yPos](#) , [CanvasCommand.xPos](#) ,  
[CanvasCommand.canvas](#) , [CanvasCommand.Canvas](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.Compile\(\)](#) , [Command.ProcessParameters\(string\)](#) ,  
[Command.ToString\(\)](#) , [object.Equals\(object\)](#) ↗ , [object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ ,  
[object.GetType\(\)](#) ↗ , [object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗

# Methods

## Execute()

Generic Execute() checks a command's parameter list and converts any variables and expressions to literal values. Should be called (base.Execute()) from derived Command classes before the derived Command uses the parameters to do its job. Derived Command should check it has the correct number of parameters and throw a CommandException if not.

```
public override void Execute()
```



# Class Poke

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Poke an array, i.e. set the value of an array cell. poke [array name] [row] [optional column] = [value]

```
public class Poke : Array, ICommand
```

## Inheritance

[object](#) ↗ ← [Command](#) ← [Evaluation](#) ← [Array](#) ← Poke

## Implements

[ICommand](#)

## Inherited Members

[Array.PEEK](#), [Array.POKE](#), [Array.type](#), [Array.rows](#), [Array.columns](#), [Array.valueInt](#), [Array.valueReal](#),  
[Array.intArray](#), [Array.realArray](#), [Array.pokeValue](#), [Array.peekVar](#), [Array.rowS](#), [Array.columnS](#), [Array.row](#),  
[Array.column](#), [Array.Rows](#), [Array.Columns](#), [Array.ArrayRestrictions\(\)](#), [Array.ReduceRestrictionCounter\(\)](#),  
[Array.ProcessArrayParametersCompile\(bool\)](#), [Array.ProcessArrayParametersExecute\(bool\)](#),  
[Array.SetIntArray\(int, int, int\)](#), [Array.SetRealArray\(double, int, int\)](#), [Array.GetIntArray\(int, int\)](#),  
[Array.GetRealArray\(int, int\)](#), [Evaluation.expression](#), [Evaluation.evaluatedExpression](#),  
[Evaluation.varName](#), [Evaluation.value](#), [Evaluation.Expression](#), [Evaluation.VarName](#), [Evaluation.Value](#),  
[Evaluation.Local](#), [Evaluation.ProcessExpression\(string\)](#), [Command.program](#), [Command.parameterList](#),  
[Command.parameters](#), [Command.paramsint](#), [Command.Program](#), [Command.Name](#),  
[Command.ParameterList](#), [Command.Parameters](#), [Command.Paramsint](#),  
[Command.ProcessParameters\(string\)](#), [Command.ToString\(\)](#), [object.Equals\(object\)](#) ↗ ,  
[object.Equals\(object, object\)](#) ↗ , [object.GetHashCode\(\)](#) ↗ , [object.GetType\(\)](#) ↗ ,  
[object.MemberwiseClone\(\)](#) ↗ , [object.ReferenceEquals\(object, object\)](#) ↗

# Constructors

## Poke()

```
public Poke()
```

# Methods

## CheckParameters(string[])

Checks that there are 3 or 4 parameters.. [array](#) (size) (optional dimension)

```
public override void CheckParameters(string[] parameter)
```

Parameters

parameter [string](#)[]

## Compile()

Ensure array is correctly declared

```
public override void Compile()
```

Exceptions

[CommandException](#)

## Execute()

Evaluate any expression and store the evaluatedExpression result in instance data for sub classes.  
Expressions are evaluated at runtime by a StoredProgram object (Program)

```
public override void Execute()
```

## Set(StoredProgram, string)

Set a Command Object

```
public override void Set(StoredProgram Program, string Params)
```

## Parameters

Program [StoredProgram](#)

Reference to valid StoredProgram

Params [string](#) ↗

Original parameter list e.g. "num1,num2"

# Class Real

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Class for a Real Number Variable.

```
public class Real : Evaluation, ICommand
```

## Inheritance

[object](#) ↳ [Command](#) ↳ [Evaluation](#) ↳ [Real](#)

## Implements

[ICommand](#)

## Inherited Members

[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Local](#) , [Evaluation.CheckParameters\(string\[\]\)](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Constructors

## Real()

Constructor calls restrictions.

```
public Real()
```

# Properties

## Value

Get double value for a real number.

```
public double Value { get; set; }
```

Property Value

[double](#)

## Methods

### Compile()

If this is a variable declaration set its value and add it to the variable table. If it is an expression then nothing happens as it already exists in the variable table.

```
public override void Compile()
```

### Execute()

Base calculates a string evaluated expression. Now see if it's a double/real value.

```
public override void Execute()
```

### Exceptions

[StoredProgramException](#)

### Restrictions()

Restrict the number of variable declarations.

```
public virtual void Restrictions()
```

### Exceptions

## RestrictionException

Thrown if variable limit exceeded.

# Class Rect

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Draw a rectangle of provided width and height with the current cursor position being the top left corner.

```
public class Rect : CommandOneParameter, ICommand
```

## Inheritance

[object](#) ← [Command](#) ← [CanvasCommand](#) ← [CommandOneParameter](#) ← Rect

## Implements

[ICommand](#)

## Inherited Members

[CommandOneParameter.param1](#) , [CommandOneParameter.param1unprocessed](#) ,  
[CanvasCommand.yPos](#) , [CanvasCommand.xPos](#) , [CanvasCommand.canvas](#) , [CanvasCommand.Canvas](#) ,  
[Command.program](#) , [Command.parameterList](#) , [Command.parameters](#) , [Command.paramsint](#) ,  
[Command.Program](#) , [Command.Name](#) , [Command.ParameterList](#) , [Command.Parameters](#) ,  
[Command.Paramsint](#) , [Command.Set\(StoredProgram, string\)](#) , [Command.Compile\(\)](#) ,  
[Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) , [object.Equals\(object\)](#) ,  
[object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Constructors

## Rect()

blank constructor for factory instantiation.

```
public Rect()
```

## Rect(Canvas, int, int)

draw from current position to x, y. cursor left at x,y

```
public Rect(Canvas c, int width, int height)
```

## Parameters

c [Canvas](#)

width [int](#)

height [int](#)

## Methods

### CheckParameters(string[])

overridden generic one parameter message to say radius and not p1.

```
public override void CheckParameters(string[] parameterList)
```

## Parameters

parameterList [string](#)[]

## Exceptions

[CommandException](#)

### Execute()

Execute the command

```
public override void Execute()
```

# Class RestrictionException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Exception thrown when restrictions are breached. If you get this you need to write your own code for the facility.

```
public class RestrictionException : BOOSEException, ISerializable
```

Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← [RestrictionException](#)

Implements

[ISerializable](#)

Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### RestrictionException(string)

```
public RestrictionException(string msg)
```

Parameters

msg [string](#)

# Class StoredProgram

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

A collection class for storing a program of Command objects, extends ArrayList to add a program counter and a flag to indicate that the syntax is ok and the program valid. Adds methods below to process variables and methods and implements flow of control for ifs and loops.

```
public class StoredProgram : ArrayList, IList, ICollection, IEnumerable,  
ICloneable, IStoredProgram
```

## Inheritance

[object](#) ← [ArrayList](#) ← StoredProgram

## Implements

[IList](#), [ICollection](#), [IEnumerable](#), [ICloneable](#), [IStoredProgram](#)

## Inherited Members

[ArrayList.Adapter\(IList\)](#), [ArrayList.Add\(object\)](#), [ArrayList.AddRange\(ICollection\)](#),  
[ArrayList.BinarySearch\(int, int, object, IComparer\)](#), [ArrayList.BinarySearch\(object\)](#),  
[ArrayList.BinarySearch\(object, IComparer\)](#), [ArrayList.Clear\(\)](#), [ArrayList.Clone\(\)](#),  
[ArrayList.Contains\(object\)](#), [ArrayList.CopyTo\(Array\)](#), [ArrayList.CopyTo\(Array, int\)](#),  
[ArrayList.CopyTo\(int, Array, int, int\)](#), [ArrayList.FixedSize\(ArrayList\)](#), [ArrayList.FixedSize\(IList\)](#),  
[ArrayList.GetEnumerator\(\)](#), [ArrayList.GetEnumerator\(int, int\)](#), [ArrayList.GetRange\(int, int\)](#),  
[ArrayList.IndexOf\(object\)](#), [ArrayList.IndexOf\(object, int\)](#), [ArrayList.IndexOf\(object, int, int\)](#),  
[ArrayList.Insert\(int, object\)](#), [ArrayList.InsertRange\(int, ICollection\)](#), [ArrayList.LastIndexOf\(object\)](#),  
[ArrayList.LastIndexOf\(object, int\)](#), [ArrayList.LastIndexOf\(object, int, int\)](#),  
[ArrayList.ReadOnly\(ArrayList\)](#), [ArrayList.ReadOnly\(IList\)](#), [ArrayList.Remove\(object\)](#),  
[ArrayList.RemoveAt\(int\)](#), [ArrayList.RemoveRange\(int, int\)](#), [ArrayList.Repeat\(object, int\)](#),  
[ArrayList.Reverse\(\)](#), [ArrayList.Reverse\(int, int\)](#), [ArrayList.SetRange\(int, ICollection\)](#),  
[ArrayList.Sort\(\)](#), [ArrayList.Sort\(IComparer\)](#), [ArrayList.Sort\(int, int, IComparer\)](#),  
[ArrayList.Synchronized\(ArrayList\)](#), [ArrayList.Synchronized\(IList\)](#), [ArrayList.ToArray\(\)](#),  
[ArrayList.ToArray\(Type\)](#), [ArrayList.TrimToSize\(\)](#), [ArrayList.Capacity](#), [ArrayList.Count](#),  
[ArrayList.IsFixedSize](#), [ArrayList.IsReadOnly](#), [ArrayList.IsSynchronized](#), [ArrayList.this\[int\]](#),  
[ArrayList.SyncRoot](#), [object.Equals\(object\)](#), [object.Equals\(object, object\)](#), [object.GetHashCode\(\)](#),  
[object.GetType\(\)](#), [object.MemberwiseClone\(\)](#), [object.ReferenceEquals\(object, object\)](#),  
[object.ToString\(\)](#)

# Constructors

## StoredProgram(ICanvas)

Create a blank program which will output to the provided Canvas object. There are a lot of methods in here and it implements the IStoredProgram interface and extends ArrayList. This makes it easier to extend StoredProgram and reimplement the methods you need.

```
public StoredProgram(ICanvas canvas)
```

### Parameters

canvas [ICanvas](#)

# Fields

## SyntaxOk

```
public bool SyntaxOk
```

### Field Value

[bool](#)

# Properties

## PC

Program Counter, points at the next command object.

```
public virtual int PC { get; set; }
```

### Property Value

[int](#)

# Methods

## Add(Command)

Adds Command to a stored program

```
public virtual int Add(Command C)
```

Parameters

C [Command](#)

Returns

[int](#)

index at which member was added

## AddMethod(Method)

Add a Method object to the methods table so it can be linked to a call.

```
public virtual void AddMethod(Method M)
```

Parameters

M [Method](#)

Method Object to add

## AddVariable(Evaluation)

Add a variable/evaluation to the Stored Program.

```
public virtual void AddVariable(Evaluation Variable)
```

Parameters

## Variable Evaluation

Evaluation Object

### Commandsleft()

Are there any commands left to execute in the program? i.e. pc (Program Counter) has not yet reached the end of the program

```
public virtual bool Commandsleft()
```

Returns

bool

true if commands left to execute, false if the end has been reached

### DeleteVariable(string)

If the passed in variable name exists then delete it.

```
public virtual void DeleteVariable(string varName)
```

Parameters

varName string

Variable name to delete.

### EvaluateExpression(string)

Evaluate the given expression by finding the values of any variables and passing the final evaluated result as a String. Uses the DataTable Class Compute() method which can parse an expression as a string, but it doesn't know about boose variable so they have to be converted to values and the expression assembled with them.

```
public virtual string EvaluateExpression(string Exp)
```

Parameters

Exp [string](#)

Returns

[string](#)

Exceptions

[StoredProgramException](#)

Throws StoredProgramException if it cannot be evaluated. Use IsExpression() before calling to prevent this exception being thrown.

## EvaluateExpressionWithString(string)

Evaluate an expression with a string. i.e. area + " cm^2"

```
public virtual string EvaluateExpressionWithString(string expression)
```

Parameters

expression [string](#)

Expression as a String

Returns

[string](#)

Resulting string to display.

## FindVariable(Evaluation)

Finds the position of a Variable Object in the Variable table.

```
public virtual int FindVariable(Evaluation Variable)
```

## Parameters

### Variable Evaluation

Evaluation Object to find.

## Returns

[int ↗](#)

Position or -1 if not found

## FindVariable(string)

Get a variable's position in the Variable table. The variable is expressed by its string name.

```
public virtual int FindVariable(string varName)
```

## Parameters

### varName string ↗

The string name of the variable.

## Returns

[int ↗](#)

-1 if not found, otherwise the position.

## GetMethod(string)

Get the method object from the StoredProgram's method table from its string name.

```
public virtual Method GetMethod(string MethodName)
```

## Parameters

### MethodName string ↗

String name of method.

Returns

[Method](#)

Exceptions

[StoredProgramException](#)

Thrown if method does not exist

## GetVarValue(string)

Returns a variables value from it string name.

```
public virtual string GetVarValue(string varName)
```

Parameters

varName [string](#)

Variable name.

Returns

[string](#)

String value of variable.

Exceptions

[StoredProgramException](#)

If variable is not found.

## GetVariable(int)

Return the Variable object at the given index in the Variable table.

```
public virtual Evaluation GetVariable(int index)
```

## Parameters

**index** [int](#)

Position in Variables table to extract.

## Returns

[Evaluation](#)

Position of object in Variables Table.

## Exceptions

[StoredProgramException](#)

Thrown if invalid index is passed.

## GetVariable(string)

Get a Variable Object. Evaluation is the base class, it could itself be a subclass of the actual types (int, real boolean etc).

```
public virtual Evaluation GetVariable(string VarName)
```

## Parameters

**VarName** [string](#)

## Returns

[Evaluation](#)

Evaluation Object of the found type

## Exceptions

[StoredProgramException](#)

Throws exception if cannot be found, should check that it is there first.

## IsExpression(string)

```
public virtual bool IsExpression(string expression)
```

Parameters

**expression** [string](#)

Returns

[bool](#)

## NextCommand()

```
public virtual object NextCommand()
```

Returns

[object](#)

## Pop()

Pop a compound command onto the stack. Used for whiles/if/fors/methods to move the PC.

```
public virtual ConditionalCommand Pop()
```

Returns

[ConditionalCommand](#)

Exceptions

[StoredProgramException](#)

Throws StoredProgramException if it can't pop, which is assumed to be because there is a compound statement without and end.

## Push(ConditionalCommand)

Push a compound command onto the stack. Used for whiles/if/fors/methods to move the PC.

```
public virtual void Push(ConditionalCommand Com)
```

### Parameters

Com [ConditionalCommand](#)

Compound Command Object

## ResetProgram()

Once a program has finished executing it needs to be reset (Program Counter set to zero)

```
public virtual void ResetProgram()
```

## Run()

Attempt to execute the program, throws a StoredProgram if it cannot run to completion. It is probably better to not try and run a program that passed an errorlist back from Parser.ParseProgram() but it will try. The parser object should have generated a runnable program before running. Attempts to detect infinite loops by detecting it has gone round the run loop a lot.

```
public virtual void Run()
```

### Exceptions

[StoredProgramException](#)

## UpdateVariable(string, bool)

Update integer variable value.

```
public virtual void UpdateVariable(string varName, bool value)
```

Parameters

**varName** [string](#)

String name of variable.

**value** [bool](#)

New integer value.

## UpdateVariable(string, double)

Update real variable value.

```
public virtual void UpdateVariable(string varName, double value)
```

Parameters

**varName** [string](#)

String name of variable.

**value** [double](#)

New real value.

## UpdateVariable(string, int)

Update an existing variable's integer value if it is found, do nothing if not found.

```
public virtual void UpdateVariable(string varName, int value)
```

Parameters

**varName** [string](#)

String name of variable.

**value** [int](#)

Integer value to change the variable to.

## VariableExists(string)

Returns true if the variable specified by its name exists.

```
public virtual bool VariableExists(string varName)
```

Parameters

**varName** [string](#)

String variable name.

Returns

[bool](#)

true if variable has been declared previously.

# Class StoredProgramException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

exception generated by the StoredProgram class

```
public class StoredProgramException : BOOSEException, ISerializable
```

## Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← [StoredProgramException](#)

## Implements

[ISerializable](#)

## Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

## Constructors

### StoredProgramException(string)

```
public StoredProgramException(string msg)
```

## Parameters

msg [string](#)

# Class VarException

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

Exception raised by variable commands.

```
public class VarException : BOOSEException, ISerializable
```

## Inheritance

[object](#) ← [Exception](#) ← [BOOSEException](#) ← VarException

## Implements

[ISerializable](#)

## Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,  
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,  
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,  
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Constructors

## VarException(string)

```
public VarException(string msg)
```

## Parameters

msg [string](#)

# Class While

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

While command. So far blank as it doesn't do anything beyond ConditionalCommand but it makes the code clearer (in the factory).

```
public class While : CompoundCommand, ICommand
```

## Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← [Boolean](#) ← [ConditionalCommand](#) ← [CompoundCommand](#) ← [While](#)

## Implements

[ICommand](#)

## Inherited Members

[CompoundCommand.CorrespondingCommand](#) , [CompoundCommand.ReduceRestrictions\(\)](#) ,  
[CompoundCommand.CheckParameters\(string\[\]\)](#) , [CompoundCommand.Compile\(\)](#) ,  
[ConditionalCommand.endLineNumber](#) , [ConditionalCommand.EndLineNumber](#) ,  
[ConditionalCommand.Condition](#) , [ConditionalCommand.LineNumber](#) , [ConditionalCommand.CondType](#) ,  
[ConditionalCommand.ReturnLineNumber](#) , [ConditionalCommand.Execute\(\)](#) , [Boolean.BoolValue](#) ,  
[Boolean.Restrictions\(\)](#) , [Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) ,  
[Evaluation.value](#) , [Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Parmsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Class Write

Namespace: [BOOSE](#)

Assembly: BOOSE.dll

```
public class Write : Evaluation, ICommand
```

## Inheritance

[object](#) ← [Command](#) ← [Evaluation](#) ← Write

## Implements

[ICommand](#)

## Inherited Members

[Evaluation.expression](#) , [Evaluation.evaluatedExpression](#) , [Evaluation.varName](#) , [Evaluation.value](#) ,  
[Evaluation.Expression](#) , [Evaluation.VarName](#) , [Evaluation.Value](#) , [Evaluation.Local](#) , [Evaluation.Compile\(\)](#) ,  
[Evaluation.ProcessExpression\(string\)](#) , [Command.program](#) , [Command.parameterList](#) ,  
[Command.parameters](#) , [Command.paramsint](#) , [Command.Program](#) , [Command.Name](#) ,  
[Command.ParameterList](#) , [Command.Parameters](#) , [Command.Paramsint](#) ,  
[Command.Set\(StoredProgram, string\)](#) , [Command.ProcessParameters\(string\)](#) , [Command.ToString\(\)](#) ,  
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,  
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

# Methods

## CheckParameters(string[])

Does nothing in this case.

```
public override void CheckParameters(string[] parameter)
```

## Parameters

parameter [string](#)[]

## Execute()

Write string to console. Also puts the evaluated string into this.evaluatedExpression so it can be used for outputting to other components, such as a text field.

```
public override void Execute()
```