

Mufasa

1.1

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## Namespace Index

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## Chapter 2

# Hierarchical Index

### 2.1 Class Hierarchy

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

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## Chapter 4

# Namespace Documentation

### 4.1 Package Mufasa

#### Namespaces

- package [BackEnd](#)
- package [Pages](#)

#### Classes

- class [App](#)  
*Interaction logic for App.xaml*
- class [MainWindow](#)  
*Interaction logic for MainWindow.xaml*

### 4.2 Package Mufasa.BackEnd

#### Namespaces

- package [Designer](#)
- package [Exceptions](#)
- package [Lea](#)
- package [Scores](#)
- package [TmThal](#)

### 4.3 Package Mufasa.BackEnd.Designer

#### Classes

- class [Construct](#)
- class [Designer](#)
- class [DesignerSettings](#)
- class [Fragment](#)
- class [Overlap](#)
- class [OverlapOptimizer](#)

## 4.4 Package Mufasa.BackEnd.Exceptions

### Classes

- class [AssemblyException](#)  
*Assbly exception*
- class [FragmentNamingException](#)
- class [SequenceCountException](#)
- class [SequenceLengthException](#)
- class [TmThalParamException](#)

## 4.5 Package Mufasa.BackEnd.Lea

### Classes

- class [Chromosome](#)
- class [LeaSettings](#)

## 4.6 Package Mufasa.BackEnd.Scores

### Classes

- class [Score](#)
- class [ScoreMean](#)
- class [ScoreOptimum](#)
- class [ScoreTotal](#)

## 4.7 Package Mufasa.BackEnd.TmThal

### Classes

- class **Thermodynamics**
- class [TmThalSettings](#)

## 4.8 Package Mufasa.Pages

### Namespaces

- package [Settings](#)

### Classes

- class [Design](#)  
*Design*
- class [FragmentViewModel](#)  
*Wraps Fragment class and provides notification of changes*
- class [Reaction](#)  
*Reaction*

- class [SettingsPage](#)  
[SettingsPage](#)
- class [VolumeConverter](#)

## 4.9 Package Mufasa.Pages.Settings

### Classes

- class [About](#)  
[About](#)
- class [Appearance](#)  
[Appearance](#)
- class [AppearanceViewModel](#)  
*A simple view model for configuring theme, font and accent colors. Based on Modern UI for WPF.*
- class [ParametersViewModel](#)
- class [ReactionSettings](#)  
[ReactionSettings](#)
- class [Settings](#)  
[Settings](#)

## 4.10 Package XamlGeneratedNamespace

### Classes

- class [GeneratedInternalTypeHelper](#)  
[GeneratedInternalTypeHelper](#)





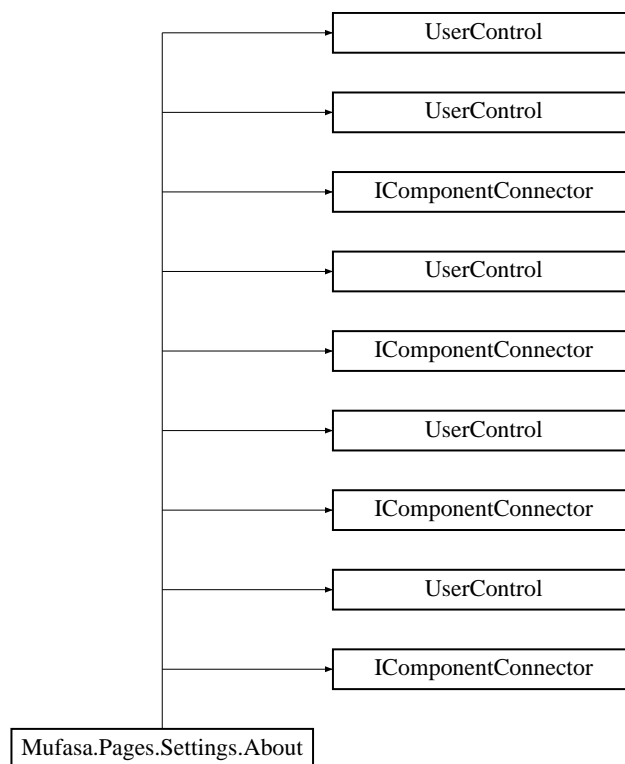
## Chapter 5

# Class Documentation

### 5.1 Mufasa.Pages.Settings.About Class Reference

[About](#)

Inheritance diagram for Mufasa.Pages.Settings.About:



#### Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.1.1 Detailed Description

#### About

Interaction logic for About.xaml

### 5.1.2 Member Function Documentation

#### 5.1.2.1 void Mufasa.Pages.Settings.About.InitializeComponent ( )

InitializeComponent

#### 5.1.2.2 void Mufasa.Pages.Settings.About.InitializeComponent ( )

InitializeComponent

#### 5.1.2.3 void Mufasa.Pages.Settings.About.InitializeComponent ( )

InitializeComponent

#### 5.1.2.4 void Mufasa.Pages.Settings.About.InitializeComponent ( )

InitializeComponent

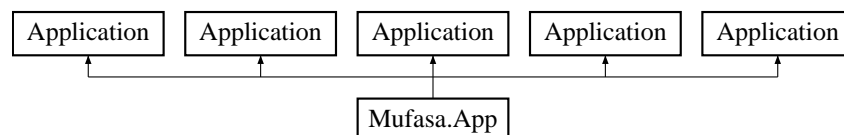
The documentation for this class was generated from the following files:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/About.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/About.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Settings/About.xaml.cs

## 5.2 Mufasa.App Class Reference

Interaction logic for App.xaml

Inheritance diagram for Mufasa.App:



### Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

### Static Public Member Functions

- static void [Main](#) ()  
*Application Entry Point.*
- static void [Main](#) ()  
*Application Entry Point.*
- static void [Main](#) ()  
*Application Entry Point.*
- static void [Main](#) ()  
*Application Entry Point.*

#### 5.2.1 Detailed Description

Interaction logic for App.xaml

[App](#)

#### 5.2.2 Member Function Documentation

##### 5.2.2.1 void Mufasa.App.InitializeComponent ( )

InitializeComponent

##### 5.2.2.2 void Mufasa.App.InitializeComponent ( )

InitializeComponent

##### 5.2.2.3 void Mufasa.App.InitializeComponent ( )

InitializeComponent

##### 5.2.2.4 void Mufasa.App.InitializeComponent ( )

InitializeComponent

##### 5.2.2.5 static void Mufasa.App.Main ( ) [static]

Application Entry Point.

##### 5.2.2.6 static void Mufasa.App.Main ( ) [static]

Application Entry Point.

### 5.2.2.7 static void Mufasa.App.Main ( ) [static]

Application Entry Point.

### 5.2.2.8 static void Mufasa.App.Main ( ) [static]

Application Entry Point.

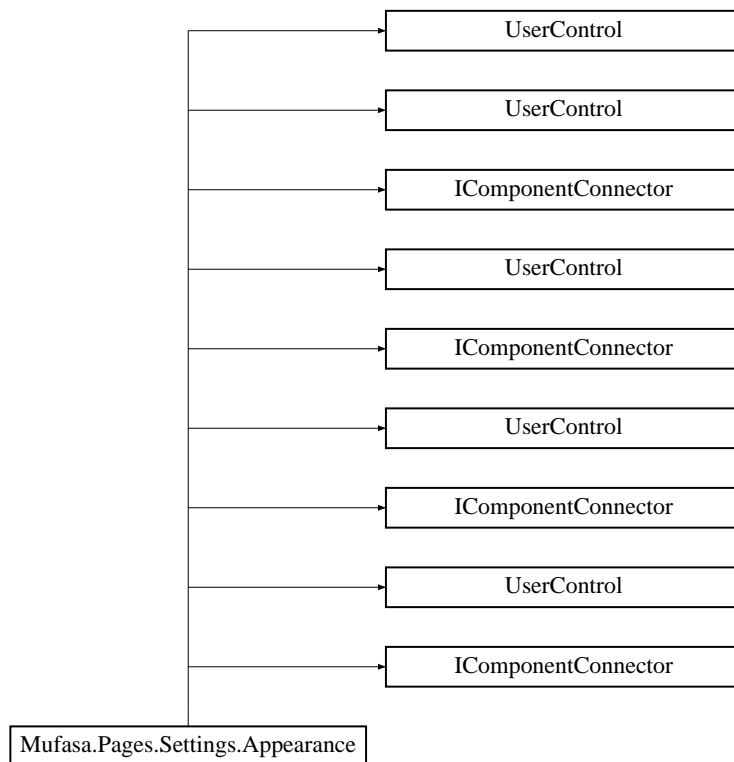
The documentation for this class was generated from the following files:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/App.xaml.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/App.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/App.g.i.cs

## 5.3 Mufasa.Pages.Settings.Appearance Class Reference

### Appearance

Inheritance diagram for Mufasa.Pages.Settings.Appearance:



### Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.3.1 Detailed Description

#### Appearance

Interaction logic for Appearance.xaml

### 5.3.2 Member Function Documentation

#### 5.3.2.1 void Mufasa.Pages.Settings.Appearance.InitializeComponent ( )

InitializeComponent

#### 5.3.2.2 void Mufasa.Pages.Settings.Appearance.InitializeComponent ( )

InitializeComponent

#### 5.3.2.3 void Mufasa.Pages.Settings.Appearance.InitializeComponent ( )

InitializeComponent

#### 5.3.2.4 void Mufasa.Pages.Settings.Appearance.InitializeComponent ( )

InitializeComponent

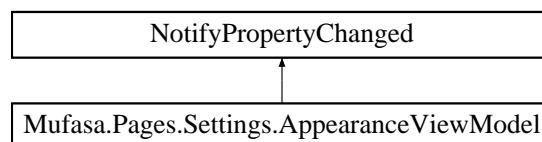
The documentation for this class was generated from the following files:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/Appearance.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/Appearance.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Settings/Appearance.xaml.cs

## 5.4 Mufasa.Pages.Settings.AppearanceViewModel Class Reference

A simple view model for configuring theme, font and accent colors. Based on Modern UI for WPF.

Inheritance diagram for Mufasa.Pages.Settings.AppearanceViewModel:



### Properties

- string[] **FontSizes** [get]
- Color[] **AccentColors** [get]
- Link **SelectedTheme** [get, set]
- string **SelectedFontSize** [get, set]
- Color **SelectedAccentColor** [get, set]

### 5.4.1 Detailed Description

A simple view model for configuring theme, font and accent colors. Based on Modern UI for WPF.

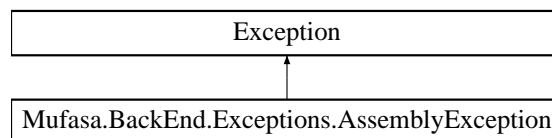
The documentation for this class was generated from the following file:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Settings/AppearanceViewModel.cs

## 5.5 Mufasa.BackEnd.Exceptions.AssemblyException Class Reference

Assbly exception

Inheritance diagram for Mufasa.BackEnd.Exceptions.AssemblyException:



### Public Member Functions

- [AssemblyException](#) ()  
*AssemblyException* constructor.
- [AssemblyException](#) (string message)  
*AssemblyException* constructor.

### 5.5.1 Detailed Description

Assbly exception

### 5.5.2 Constructor & Destructor Documentation

#### 5.5.2.1 Mufasa.BackEnd.Exceptions.AssemblyException.AssemblyException ( )

[AssemblyException](#) constructor.

#### 5.5.2.2 Mufasa.BackEnd.Exceptions.AssemblyException.AssemblyException ( string message )

[AssemblyException](#) constructor.

Parameters

<i>message</i>	Message to send.
----------------	------------------

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Exceptions/AssemblyException.cs

## 5.6 Mufasa.BackEnd.Lea.Chromosome Class Reference

## Public Member Functions

- [Chromosome](#) (List< int > lengths\_3, List< int > lengths\_5, double targetTm)  
*Chromosome constructor.*
- [Chromosome](#) ([Chromosome](#) c)  
*Chromosome copying constructor.*
- **Chromosome** (List< [Overlap](#) > preoptimized, double targetTm)
- List< [Overlap](#) > [ToOverlaps](#) (List< [Overlap](#) > templates)  
*Converts the chromosome to its corresponding overlap list.*
- [ScoreTotal Evaluate](#) (List< [Overlap](#) > templates, [DesignerSettings](#) settings, bool ignoreHeterodimers)  
*Evaluate the chromosome.*

## Properties

- List< [Overlap](#) > [Overlaps](#) [get, set]  
*Overlap list.*
- List< int > [Lengths\\_3](#) [get, set]
- List< int > [Lengths\\_5](#) [get, set]
- [ScoreTotal Score](#) [get]

### 5.6.1 Constructor & Destructor Documentation

#### 5.6.1.1 Mufasa.BackEnd.Lea.Chromosome.Chromosome ( List< int > lengths\_3, List< int > lengths\_5, double targetTm )

[Chromosome](#) constructor.

Parameters

<i>lengths_3</i>	List of 3' lengths.
<i>lengths_5</i>	List of 5' lengths.

#### 5.6.1.2 Mufasa.BackEnd.Lea.Chromosome.Chromosome ( [Chromosome](#) c )

[Chromosome](#) copying constructor.

Parameters

<i>c</i>	
----------	--

### 5.6.2 Member Function Documentation

#### 5.6.2.1 [ScoreTotal](#) Mufasa.BackEnd.Lea.Chromosome.Evaluate ( List< [Overlap](#) > templates, [DesignerSettings](#) settings, bool ignoreHeterodimers )

Evaluate the chromosome.

Parameters

<i>templates</i>	List of overlap templates.
<i>settings</i>	<a href="#">Designer</a> settings.

Returns

Total score of the chromosome.

5.6.2.2 `List<Overlap> Mufasa.BackEnd.Lea.Chromosome.ToOverlaps ( List< Overlap > templates )`

Converts the chromosome to its corresponding overlap list.



## Parameters

<i>templates</i>	List of overlap templates.
------------------	----------------------------

## Returns

List of overlaps represented by this chromosome.

## 5.6.3 Property Documentation

**5.6.3.1** `List<int> Mufasa.BackEnd.Lea.Chromosome.Lengths_3` [get], [set]

List of lengths of 3' (overhang) parts of the overlaps./>

**5.6.3.2** `List<int> Mufasa.BackEnd.Lea.Chromosome.Lengths_5` [get], [set]

List of lengths of 3' (overhang) parts of the overlaps./>

**5.6.3.3** `List<Overlap> Mufasa.BackEnd.Lea.Chromosome.Overlaps` [get], [set]

Overlap list.

**5.6.3.4** `ScoreTotal Mufasa.BackEnd.Lea.Chromosome.Score` [get]

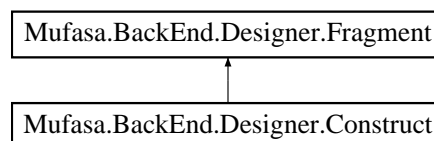
Score of the chromosome./>

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Lea/Chromosome.cs

## 5.7 Mufasa.BackEnd.Designer.Construct Class Reference

Inheritance diagram for Mufasa.BackEnd.Designer.Construct:



## Public Member Functions

- [Construct](#) ()  
*Empty [Construct](#) constructor.*
- [Construct](#) (List< [Overlap](#) > overlaps, ISequence sequence, [DesignerSettings](#) settings)  
*Pre-optimized [Construct](#) constructor.*
- [Construct](#) (ObservableCollection< [Fragment](#) > fragList, [DesignerSettings](#) settings)  
*[Construct](#) constructor.*
- [Construct](#) (ObservableCollection< String > constructionList, Dictionary< String, [Fragment](#) > fragDict, [DesignerSettings](#) settings)  
*[Construct](#) constructor.*

- bool [IsEmpty](#) ()  
*Checks if the construct is empty.*
- void [SaveAsBio](#) (String path)  
*Save in one of .NET Bio supported formats like fasta or GenBank.*
- [ScoreTotal Evaluate](#) (bool ignoreHeterodimers=false)  
*Compute construct score.*

## Properties

- [ScoreTotal Score](#) [get, set]
- [DesignerSettings Settings](#) [get, set]
- List< [Overlap](#) > [Overlaps](#) [get, set]

### 5.7.1 Detailed Description

Genetic construct class.

### 5.7.2 Constructor & Destructor Documentation

#### 5.7.2.1 Mufasa.BackEnd.Designer.Construct.Construct ( )

Empty [Construct](#) constructor.

Parameters

<i>fragList</i>	<a href="#">Fragment</a> list.
-----------------	--------------------------------

#### 5.7.2.2 Mufasa.BackEnd.Designer.Construct.Construct ( List< [Overlap](#) > *overlaps*, ISequence *sequence*, DesignerSettings *settings* )

Pre-optimized [Construct](#) constructor.

Parameters

<i>fragList</i>	<a href="#">Fragment</a> list.
-----------------	--------------------------------

#### 5.7.2.3 Mufasa.BackEnd.Designer.Construct.Construct ( ObservableCollection< [Fragment](#) > *fragList*, DesignerSettings *settings* )

[Construct](#) constructor.

Parameters

<i>fragList</i>	<a href="#">Fragment</a> list.
-----------------	--------------------------------

#### 5.7.2.4 Mufasa.BackEnd.Designer.Construct.Construct ( ObservableCollection< String > *constructionList*, Dictionary< String, [Fragment](#) > *fragDict*, DesignerSettings *settings* )

[Construct](#) constructor.

## Parameters

<i>fragDict</i>	<a href="#">Fragment</a> Dictionary.
<i>constructionList</i>	<a href="#">Fragment</a> names. Dictionary keys.

### 5.7.3 Member Function Documentation

#### 5.7.3.1 **ScoreTotal** Mufasa.BackEnd.Designer.Construct.Evaluate ( *bool ignoreHeterodimers = false* )

Compute construct score.

## Returns

Total construct score.

#### 5.7.3.2 **bool** Mufasa.BackEnd.Designer.Construct.IsEmpty ( )

Checks if the construct is empty.

#### 5.7.3.3 **void** Mufasa.BackEnd.Designer.Construct.SaveAsBio ( *String path* )

Save in one of .NET Bio supported formats like fasta or GenBank.

## Parameters

<i>path</i>	Filename.
-------------	-----------

### 5.7.4 Property Documentation

#### 5.7.4.1 **List<Overlap>** Mufasa.BackEnd.Designer.Construct.Overlaps [get], [set]

Generated overlaps collection.

#### 5.7.4.2 **ScoreTotal** Mufasa.BackEnd.Designer.Construct.Score [get], [set]

Total construct score.

#### 5.7.4.3 **DesignerSettings** Mufasa.BackEnd.Designer.Construct.Settings [get], [set]

[Designer](#) settings.

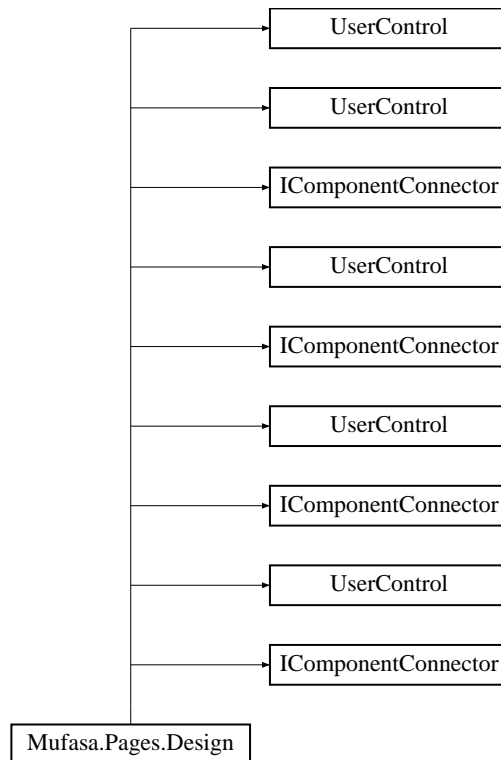
The documentation for this class was generated from the following file:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Designer/Construct.cs

## 5.8 Mufasa.Pages.Design Class Reference

[Design](#)

Inheritance diagram for Mufasa.Pages.Design:



## Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.8.1 Detailed Description

#### [Design](#)

Interaction logic for Design.xaml

### 5.8.2 Member Function Documentation

#### 5.8.2.1 void Mufasa.Pages.Design.InitializeComponent ( )

InitializeComponent

#### 5.8.2.2 void Mufasa.Pages.Design.InitializeComponent ( )

InitializeComponent

## 5.8.2.3 void Mufasa.Pages.Design.InitializeComponent ( )

InitializeComponent

## 5.8.2.4 void Mufasa.Pages.Design.InitializeComponent ( )

InitializeComponent

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Design.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Design.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Design.xaml.cs

## 5.9 Mufasa.BackEnd.Designer.Designer Class Reference

### Public Member Functions

- [Designer](#) ()  
*Designer constructor.*
- void [AddFragment](#) (String file, String name)  
*Adds Fragment name if valid.*
- void [AddBrickFromRegistry](#) (String url, String sequenceString, String name)  
*Adds a BioBrick name if valid.*
- void [AddConstructionFragment](#) (String fragmentName)  
*Adds a fragment to construction dictionary.*
- void **openProject** (String file)

### Public Attributes

- const String **VectorLabel** = "vect."

### Properties

- Dictionary< String, [Fragment](#) > [FragmentDict](#) [get, set]
- ObservableCollection< String > [ConstructionList](#) [get, set]
- [DesignerSettings Settings](#) [get, set]

### 5.9.1 Detailed Description

[Construct](#) designer class.

### 5.9.2 Constructor & Destructor Documentation

## 5.9.2.1 Mufasa.BackEnd.Designer.Designer.Designer ( )

[Designer](#) constructor.

### 5.9.3 Member Function Documentation

5.9.3.1 void Mufasa.BackEnd.Designer.Designer.AddBrickFromRegistry ( String *url*, String *sequenceString*, String *name* )

Adds a BioBrick *name* if valid.

## Parameters

<i>url</i>	URL to a BioBrick in .fasta format.
<i>name</i>	BioBrock name.

5.9.3.2 void Mufasa.BackEnd.Designer.Designer.AddConstructionFragment ( String *fragmentName* )

Adds a fragment to construction dictionary.

## Parameters

<i>fragment</i>	Name of the fragment to add.
-----------------	------------------------------

5.9.3.3 void Mufasa.BackEnd.Designer.Designer.AddFragment ( String *file*, String *name* )

Adds [Fragment](#) *name* if valid.

## Parameters

<i>file</i>	<a href="#">Fragment</a> filename
<i>name</i>	<a href="#">Fragment</a> name

## 5.9.4 Property Documentation

## 5.9.4.1 ObservableCollection&lt;String&gt; Mufasa.BackEnd.Designer.Designer.ConstructionList [get], [set]

Dictionary of construction fragments.

## 5.9.4.2 Dictionary&lt;String,Fragment&gt; Mufasa.BackEnd.Designer.Designer.FragmentDict [get], [set]

Dictionary of pooled fragments.

## 5.9.4.3 DesignerSettings Mufasa.BackEnd.Designer.Designer.Settings [get], [set]

[Designer](#) settings.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Designer/Designer.cs

## 5.10 Mufasa.BackEnd.Designer.DesignerSettings Class Reference

## Public Member Functions

- [DesignerSettings](#) ()  
*Designer settings constructor.*

## Public Attributes

- [TmThalSettings](#) [TmThalSettings](#)  
*TmThal settings*
- [LeaSettings](#) [LeaSettings](#)  
*Lea settings*

## Properties

- String [TmThalParamPath](#) [get, set]
- bool [UseNaive](#) [get, set]
- int [MinLen\\_3](#) [get, set]
- int [MaxLen\\_3](#) [get, set]
- int [MinLen\\_5](#) [get, set]
- int [MaxLen\\_5](#) [get, set]
- double [ReactionVolume](#) [get, set]
- double [TargetTm](#) [get, set]
- double [MaxTh](#) [get, set]
- double [MaxTd](#) [get, set]

### 5.10.1 Detailed Description

Design settings class.

### 5.10.2 Constructor & Destructor Documentation

#### 5.10.2.1 `Mufasa.BackEnd.Designer.DesignerSettings.DesignerSettings ( )`

[Designer](#) settings constructor.

### 5.10.3 Member Data Documentation

#### 5.10.3.1 `LeaSettings Mufasa.BackEnd.Designer.DesignerSettings.LeaSettings`

[Lea](#) settings

#### 5.10.3.2 `TmThalSettings Mufasa.BackEnd.Designer.DesignerSettings.TmThalSettings`

[TmThal](#) settings

### 5.10.4 Property Documentation

#### 5.10.4.1 `int Mufasa.BackEnd.Designer.DesignerSettings.MaxLen_3` [get], [set]

Maximal length of the 3' ("gene-specific") part of an overlap.

#### 5.10.4.2 `int Mufasa.BackEnd.Designer.DesignerSettings.MaxLen_5` [get], [set]

Maximal length of the 5' ("overhang") part of an overlap.

#### 5.10.4.3 `double Mufasa.BackEnd.Designer.DesignerSettings.MaxTd` [get], [set]

Max duplex melting temperature.

#### 5.10.4.4 `double Mufasa.BackEnd.Designer.DesignerSettings.MaxTh` [get], [set]

Max hairpin melting temperature.



5.10.4.5 `int Mufasa.BackEnd.Designer.DesignerSettings.MinLen_3` `[get]`, `[set]`

Minimal length of the 3' ("gene-specific") part of an overlap.

5.10.4.6 `int Mufasa.BackEnd.Designer.DesignerSettings.MinLen_5` `[get]`, `[set]`

Minimal length of the 5' ("overhang") part of an overlap.

5.10.4.7 `double Mufasa.BackEnd.Designer.DesignerSettings.ReactionVolume` `[get]`, `[set]`

CPEC/Gibson assembly reaction volume.

5.10.4.8 `double Mufasa.BackEnd.Designer.DesignerSettings.TargetTm` `[get]`, `[set]`

Target overlap melting temperature.

5.10.4.9 `String Mufasa.BackEnd.Designer.DesignerSettings.TmThalParamPath` `[get]`, `[set]`

Path to Primer3's thermodynamic parameters folder.

5.10.4.10 `bool Mufasa.BackEnd.Designer.DesignerSettings.UseNaive` `[get]`, `[set]`

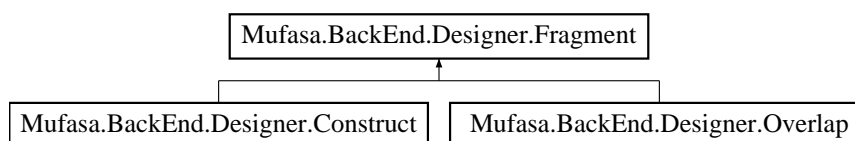
Use the naive-greedy algorithm.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Designer/DesignerSettings.cs

## 5.11 Mufasa.BackEnd.Designer.Fragment Class Reference

Inheritance diagram for Mufasa.BackEnd.Designer.Fragment:



### Public Member Functions

- [Fragment](#) (String source, String name, ISequence sequence, bool vector=false)  
*Fragment constructor.*
- [Fragment](#) ()  
*Fragment constructor.*
- [Fragment](#) (Fragment frag)  
*Copying Fragment constructor.*
- string [GetString](#) ()  
*Returns full fragment sequence as a string. Based on .NET Bio Programming Guide.*
- string [GetReverseComplementString](#) ()  
*Returns full fragment reverse complement sequence as a string.*

## Properties

- String [Source](#) [get, set]
- String [Name](#) [get, set]  
*Name of the fragment.*
- ISequence [Sequence](#) [get, set]  
*Fragment sequence.*
- double [Concentration](#) [get, set]  
*Concentration.*
- long [Length](#) [get, set]  
*Length.*
- bool [IsVector](#) [get, set]  
*True if this is a vector sequence.*
- double [Volume](#) [get, set]  
*Fragment sample volume.*
- double [ReactionVolume](#) [get, set]  
*Reaction volume.*

### 5.11.1 Detailed Description

DNA fragment class.

### 5.11.2 Constructor & Destructor Documentation

5.11.2.1 `Mufasa.BackEnd.Designer.Fragment.Fragment ( String source, String name, ISequence sequence, bool vector = false )`

[Fragment](#) constructor.

Parameters

<i>source</i>	Filename or URL.
<i>name</i>	<a href="#">Fragment</a> name.

5.11.2.2 `Mufasa.BackEnd.Designer.Fragment.Fragment ( )`

[Fragment](#) constructor.

5.11.2.3 `Mufasa.BackEnd.Designer.Fragment.Fragment ( Fragment frag )`

Copying [Fragment](#) constructor.

### 5.11.3 Member Function Documentation

5.11.3.1 `string Mufasa.BackEnd.Designer.Fragment.GetReverseComplementString ( )`

Returns full fragment reverse complement sequence as a string.

Returns

Reverse complement sequence string.

### 5.11.3.2 string Mufasa.BackEnd.Designer.Fragment.GetString ( )

Returns full fragment sequence as a string. Based on .NET Bio Programming Guide.

Returns

Sequence string.

## 5.11.4 Property Documentation

### 5.11.4.1 double Mufasa.BackEnd.Designer.Fragment.Concentration [get], [set]

Concentration.

### 5.11.4.2 bool Mufasa.BackEnd.Designer.Fragment.IsVector [get], [set]

True if this is a vector sequence.

### 5.11.4.3 long Mufasa.BackEnd.Designer.Fragment.Length [get], [set]

Length.

### 5.11.4.4 String Mufasa.BackEnd.Designer.Fragment.Name [get], [set]

Name of the fragment.

### 5.11.4.5 double Mufasa.BackEnd.Designer.Fragment.ReactionVolume [get], [set]

Reaction volume.

### 5.11.4.6 ISequence Mufasa.BackEnd.Designer.Fragment.Sequence [get], [set]

[Fragment](#) sequence.

### 5.11.4.7 String Mufasa.BackEnd.Designer.Fragment.Source [get], [set]

Path to the file or url containing the fragment.

### 5.11.4.8 double Mufasa.BackEnd.Designer.Fragment.Volume [get], [set]

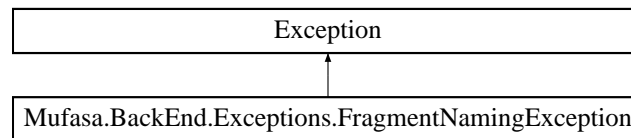
[Fragment](#) sample volume.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Designer/Fragment.cs

## 5.12 Mufasa.BackEnd.Exceptions.FragmentNamingException Class Reference

Inheritance diagram for Mufasa.BackEnd.Exceptions.FragmentNamingException:



## Public Member Functions

- [FragmentNamingException \(\)](#)  
*FragmentNamingException constructor.*
- [FragmentNamingException \(string message\)](#)  
*FragmentNamingException constructor.*

### 5.12.1 Detailed Description

Exception thrown if a fragment name is invalid. BackEnd.Designer.Designer.cs

### 5.12.2 Constructor & Destructor Documentation

#### 5.12.2.1 Mufasa.BackEnd.Exceptions.FragmentNamingException.FragmentNamingException ( )

[FragmentNamingException](#) constructor.

#### 5.12.2.2 Mufasa.BackEnd.Exceptions.FragmentNamingException.FragmentNamingException ( string message )

[FragmentNamingException](#) constructor.

#### Parameters

<i>message</i>	Message to send.
----------------	------------------

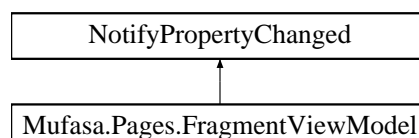
The documentation for this class was generated from the following file:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Exceptions/FragmentNamingException.cs

## 5.13 Mufasa.Pages.FragmentViewModel Class Reference

Wraps Fragment class and provides notification of changes

Inheritance diagram for Mufasa.Pages.FragmentViewModel:



## Public Member Functions

- [FragmentViewModel \(\)](#)  
*FragmentViewModel constructor.*

- [FragmentViewModel](#) ([Fragment](#) m)  
*FragmentViewModel* constructor.

## Properties

- [Fragment Model](#) [get]
- double [Concentration](#) [get, set]
- double [Volume](#) [get, set]
- double [ReactionVolume](#) [get, set]
- bool [IsVector](#) [get, set]
- long [Length](#) [get, set]
- String [Source](#) [get, set]
- String [Name](#) [get, set]
- ISequence [Sequence](#) [get, set]

### 5.13.1 Detailed Description

Wraps Fragment class and provides notification of changes

### 5.13.2 Constructor & Destructor Documentation

#### 5.13.2.1 Mufasa.Pages.FragmentViewModel.FragmentViewModel ( )

[FragmentViewModel](#) constructor.

#### 5.13.2.2 Mufasa.Pages.FragmentViewModel.FragmentViewModel ( [Fragment](#) m )

[FragmentViewModel](#) constructor.

##### Parameters

<i>m</i>	Fragment model.
----------	-----------------

### 5.13.3 Property Documentation

#### 5.13.3.1 double Mufasa.Pages.FragmentViewModel.Concentration [get], [set]

Concentration.

#### 5.13.3.2 bool Mufasa.Pages.FragmentViewModel.IsVector [get], [set]

True if a vector fragment.

#### 5.13.3.3 long Mufasa.Pages.FragmentViewModel.Length [get], [set]

Fragment length.

#### 5.13.3.4 [Fragment](#) Mufasa.Pages.FragmentViewModel.Model [get]

Fragment model.

5.13.3.5 **String** `Mufasa.Pages.FragmentViewModel.Name` [get], [set]

Name of the fragment.

5.13.3.6 **double** `Mufasa.Pages.FragmentViewModel.ReactionVolume` [get], [set]

[Reaction](#) volume.

5.13.3.7 **ISequence** `Mufasa.Pages.FragmentViewModel.Sequence` [get], [set]

Fragment sequence.

5.13.3.8 **String** `Mufasa.Pages.FragmentViewModel.Source` [get], [set]

Path to the file or url containing the fragment.

5.13.3.9 **double** `Mufasa.Pages.FragmentViewModel.Volume` [get], [set]

Sample volume.

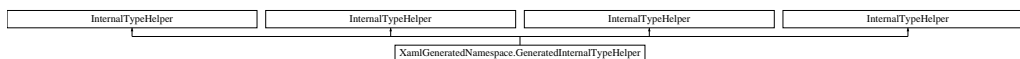
The documentation for this class was generated from the following file:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/FragmentViewModel.cs

## 5.14 XamlGeneratedNamespace.GeneratedInternalTypeHelper Class Reference

### [GeneratedInternalTypeHelper](#)

Inheritance diagram for XamlGeneratedNamespace.GeneratedInternalTypeHelper:



### Protected Member Functions

- override object [CreateInstance](#) (System.Type type, System.Globalization.CultureInfo culture)  
*CreateInstance*
- override object [GetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, System.Globalization.CultureInfo culture)  
*GetPropertyValue*
- override void [SetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, object value, System.Globalization.CultureInfo culture)  
*SetPropertyValue*
- override System.Delegate [CreateDelegate](#) (System.Type delegateType, object target, string handler)  
*CreateDelegate*
- override void [AddEventHandler](#) (System.Reflection.EventInfo eventInfo, object target, System.Delegate handler)  
*AddEventHandler*
- override object [CreateInstance](#) (System.Type type, System.Globalization.CultureInfo culture)  
*CreateInstance*

- override object [GetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, System.Globalization.CultureInfo culture)  
*GetPropertyValue*
- override void [SetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, object value, System.Globalization.CultureInfo culture)  
*SetPropertyValue*
- override System.Delegate [CreateDelegate](#) (System.Type delegateType, object target, string handler)  
*CreateDelegate*
- override void [AddEventHandler](#) (System.Reflection.EventInfo eventInfo, object target, System.Delegate handler)  
*AddEventHandler*
- override object [CreateInstance](#) (System.Type type, System.Globalization.CultureInfo culture)  
*CreateInstance*
- override object [GetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, System.Globalization.CultureInfo culture)  
*GetPropertyValue*
- override void [SetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, object value, System.Globalization.CultureInfo culture)  
*SetPropertyValue*
- override System.Delegate [CreateDelegate](#) (System.Type delegateType, object target, string handler)  
*CreateDelegate*
- override void [AddEventHandler](#) (System.Reflection.EventInfo eventInfo, object target, System.Delegate handler)  
*AddEventHandler*
- override object [CreateInstance](#) (System.Type type, System.Globalization.CultureInfo culture)  
*CreateInstance*
- override object [GetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, System.Globalization.CultureInfo culture)  
*GetPropertyValue*
- override void [SetPropertyValue](#) (System.Reflection.PropertyInfo propertyInfo, object target, object value, System.Globalization.CultureInfo culture)  
*SetPropertyValue*
- override System.Delegate [CreateDelegate](#) (System.Type delegateType, object target, string handler)  
*CreateDelegate*
- override void [AddEventHandler](#) (System.Reflection.EventInfo eventInfo, object target, System.Delegate handler)  
*AddEventHandler*

### 5.14.1 Detailed Description

[GeneratedInternalTypeHelper](#)

### 5.14.2 Member Function Documentation

- 5.14.2.1 override void XamlGeneratedNamespace.GeneratedInternalTypeHelper.AddEventHandler ( System.Reflection.EventInfo *eventInfo*, object *target*, System.Delegate *handler* ) [protected]

AddEventHandler

- 5.14.2.2 override void XamlGeneratedNamespace.GeneratedInternalTypeHelper.AddEventHandler ( System.Reflection.EventInfo *eventInfo*, object *target*, System.Delegate *handler* ) [protected]

AddEventHandler

5.14.2.3 override void XamlGeneratedNamespace.GeneratedInternalTypeHelper.AddEventHandler ( System.Reflection.EventInfo *eventInfo*, object *target*, System.Delegate *handler* ) [protected]

AddEventHandler

5.14.2.4 override void XamlGeneratedNamespace.GeneratedInternalTypeHelper.AddEventHandler ( System.Reflection.EventInfo *eventInfo*, object *target*, System.Delegate *handler* ) [protected]

AddEventHandler

5.14.2.5 override System.Delegate XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateDelegate ( System.Type *delegateType*, object *target*, string *handler* ) [protected]

CreateDelegate

5.14.2.6 override System.Delegate XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateDelegate ( System.Type *delegateType*, object *target*, string *handler* ) [protected]

CreateDelegate

5.14.2.7 override System.Delegate XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateDelegate ( System.Type *delegateType*, object *target*, string *handler* ) [protected]

CreateDelegate

5.14.2.8 override System.Delegate XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateDelegate ( System.Type *delegateType*, object *target*, string *handler* ) [protected]

CreateDelegate

5.14.2.9 override object XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateInstance ( System.Type *type*, System.Globalization.CultureInfo *culture* ) [protected]

CreateInstance

5.14.2.10 override object XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateInstance ( System.Type *type*, System.Globalization.CultureInfo *culture* ) [protected]

CreateInstance

5.14.2.11 override object XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateInstance ( System.Type *type*, System.Globalization.CultureInfo *culture* ) [protected]

CreateInstance

5.14.2.12 override object XamlGeneratedNamespace.GeneratedInternalTypeHelper.CreateInstance ( System.Type *type*, System.Globalization.CultureInfo *culture* ) [protected]

CreateInstance



5.14.2.13 **override object** XamlGeneratedNamespace.GeneratedInternalTypeHelper.GetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, System.Globalization.CultureInfo *culture* )  
[protected]

GetPropertyValue

5.14.2.14 **override object** XamlGeneratedNamespace.GeneratedInternalTypeHelper.GetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, System.Globalization.CultureInfo *culture* )  
[protected]

GetPropertyValue

5.14.2.15 **override object** XamlGeneratedNamespace.GeneratedInternalTypeHelper.GetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, System.Globalization.CultureInfo *culture* )  
[protected]

GetPropertyValue

5.14.2.16 **override object** XamlGeneratedNamespace.GeneratedInternalTypeHelper.GetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, System.Globalization.CultureInfo *culture* )  
[protected]

GetPropertyValue

5.14.2.17 **override void** XamlGeneratedNamespace.GeneratedInternalTypeHelper.SetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, object *value*, System.Globalization.CultureInfo *culture* )  
[protected]

SetPropertyValue

5.14.2.18 **override void** XamlGeneratedNamespace.GeneratedInternalTypeHelper.SetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, object *value*, System.Globalization.CultureInfo *culture* )  
[protected]

SetPropertyValue

5.14.2.19 **override void** XamlGeneratedNamespace.GeneratedInternalTypeHelper.SetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, object *value*, System.Globalization.CultureInfo *culture* )  
[protected]

SetPropertyValue

5.14.2.20 **override void** XamlGeneratedNamespace.GeneratedInternalTypeHelper.SetPropertyValue (   
System.Reflection.PropertyInfo *propertyInfo*, object *target*, object *value*, System.Globalization.CultureInfo *culture* )  
[protected]

SetPropertyValue

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/GeneratedInternalTypeHelper.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/GeneratedInternalTypeHelper.g.i.cs

## 5.15 Mufasa.BackEnd.Lea.LeaSettings Class Reference

### Public Member Functions

- [LeaSettings](#) ()  
*Lea settings constructor.*

### Properties

- int [MinIterations](#) [get, set]
- int [MaxIterations](#) [get, set]
- bool [IgnoreHeterodimers](#) [get, set]
- int [PopulationSize](#) [get, set]
- int [TournamentSize](#) [get, set]
- double [CrossoverRate](#) [get, set]
- double [MutationRate](#) [get, set]
- double [LearningRate](#) [get, set]  
*Local search chance.*
- double [Epsilon](#) [get, set]  
*Stopping criterion. Best solutions variance across generations threshold.*

### 5.15.1 Detailed Description

[Lea](#) settings.

### 5.15.2 Constructor & Destructor Documentation

#### 5.15.2.1 Mufasa.BackEnd.Lea.LeaSettings.LeaSettings ( )

[Lea](#) settings constructor.

### 5.15.3 Property Documentation

#### 5.15.3.1 double Mufasa.BackEnd.Lea.LeaSettings.CrossoverRate [get], [set]

Crossover rate.

#### 5.15.3.2 double Mufasa.BackEnd.Lea.LeaSettings.Epsilon [get], [set]

Stopping criterion. Best solutions variance across generations threshold.

Variance of best solutions across generations must be lower than epsilon for the algorithm to stop.

#### 5.15.3.3 bool Mufasa.BackEnd.Lea.LeaSettings.IgnoreHeterodimers [get], [set]

True to ignore heterodimer melting temperature calculation.

#### 5.15.3.4 double Mufasa.BackEnd.Lea.LeaSettings.LearningRate [get], [set]

Local search chance.

5.15.3.5 `int Mufasa.BackEnd.Lea.LeaSettings.MaxIterations` `[get], [set]`

Max iterations to perform.

5.15.3.6 `int Mufasa.BackEnd.Lea.LeaSettings.MinIterations` `[get], [set]`

Max iterations to perform.

5.15.3.7 `double Mufasa.BackEnd.Lea.LeaSettings.MutationRate` `[get], [set]`

Mutation rate.

5.15.3.8 `int Mufasa.BackEnd.Lea.LeaSettings.PopulationSize` `[get], [set]`

Starting population size.

5.15.3.9 `int Mufasa.BackEnd.Lea.LeaSettings.TournamentSize` `[get], [set]`

Tournament size.

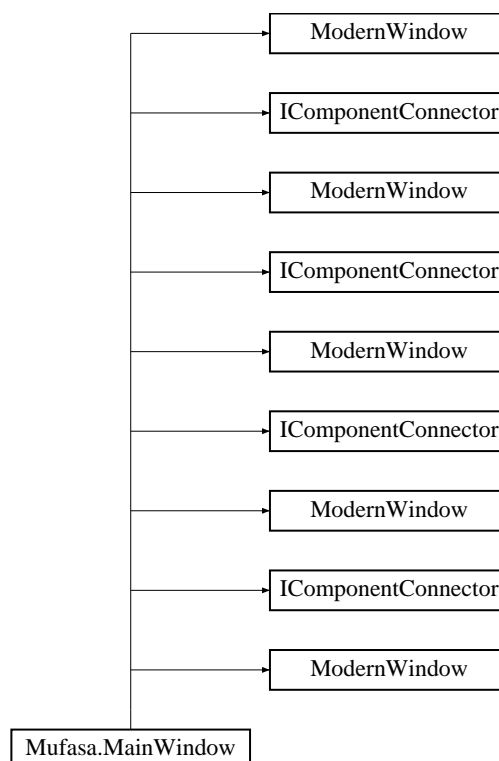
The documentation for this class was generated from the following file:

- `C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Lea/LeaSettings.cs`

## 5.16 Mufasa.MainWindow Class Reference

Interaction logic for MainWindow.xaml

Inheritance diagram for Mufasa.MainWindow:



## Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.16.1 Detailed Description

Interaction logic for MainWindow.xaml

[MainWindow](#)

### 5.16.2 Member Function Documentation

#### 5.16.2.1 void Mufasa.MainWindow.InitializeComponent ( )

InitializeComponent

#### 5.16.2.2 void Mufasa.MainWindow.InitializeComponent ( )

InitializeComponent

#### 5.16.2.3 void Mufasa.MainWindow.InitializeComponent ( )

InitializeComponent

#### 5.16.2.4 void Mufasa.MainWindow.InitializeComponent ( )

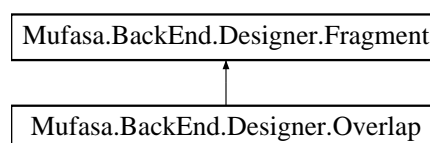
InitializeComponent

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/MainWindow.xaml.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/MainWindow.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/MainWindow.g.i.cs

## 5.17 Mufasa.BackEnd.Designer.Overlap Class Reference

Inheritance diagram for Mufasa.BackEnd.Designer.Overlap:



## Public Member Functions

- [Overlap](#) (String name, ISequence overhang\_5, ISequence geneSpecific\_3, [TmThalSettings](#) settings, int pairIndex=-1)  
*Overlap constructor.*
- [Overlap](#) (String name, ISequence primer, [TmThalSettings](#) settings, int pairIndex=-1)  
*Overlap constructor.*
- [Overlap](#) ([Overlap](#) overlap)  
*Overlap copying constructor.*
- string [ToCsv](#) ()  
*Prints the overlap in the CSV format.*
- override string [ToString](#) ()  
*Prints the overlap info.*
- double [GetSimpleMeltingTemperature](#) ()  
*Compute overlap's simple-style melting temperature.*
- double [GetDuplexTemperature](#) ([Overlap](#) twin)  
*Compute overlap's duplex melting temperature.*
- byte [Dequeue](#) (int minLen, int length=1)  
*Cut the first nucleotide off.*
- byte [Pop](#) (int minLen, int length=1)  
*Cut the last nucleotide off.*
- byte [Push](#) (int maxLen, int length=1)  
*Add a nucleotide to the oligo's 3' end.*
- byte [Enqueue](#) (int maxLen, int length=1)  
*Add a nucleotide to the oligo's 5' end.*
- bool [IsAcceptable](#) (double maxTh, double maxTd, bool ignoreHeterodimers=false)  
*Check if the overlap's melting temperatures satisfy the conditions.*

## Static Public Member Functions

- static void [CalculateHeterodimers](#) (List< [Overlap](#) > overlaps)  
*Calculate heterodimer melting temperatures.*

## Properties

- int [PairIndex](#) [get, set]
- double [HeterodimerMeltingTemperature](#) [get, set]
- double [HomodimerMeltingTemperature](#) [get]
- double [MeltingTemperature](#) [get]
- double [HairpinMeltingTemperature](#) [get]
- [TmThalSettings](#) [Settings](#) [get, set]
- ISequence [TemplateSeq\\_3](#) [get, set]
- ISequence [TemplateSeq\\_5](#) [get, set]
- ISequence [Seq\\_3](#) [get, set]
- ISequence [Seq\\_5](#) [get, set]
- String [SequenceString](#) [get]

### 5.17.1 Detailed Description

[Overlap](#) class.

## 5.17.2 Constructor & Destructor Documentation

5.17.2.1 Mufasa.BackEnd.Designer.Overlap.Overlap ( String *name*, ISequence *overhang\_5*, ISequence *geneSpecific\_3*, TmThalSettings *settings*, int *pairIndex* = -1 )

[Overlap](#) constructor.

## Parameters

<i>name</i>	<a href="#">Overlap</a> name.
<i>overhang_5</i>	Overhang sequence.
<i>geneSpecific_3</i>	Gene specific sequence.

5.17.2.2 `Mufasa.BackEnd.Designer.Overlap.Overlap ( String name, ISequence primer, TmThalSettings settings, int pairIndex = -1 )`

[Overlap](#) constructor.

## Parameters

<i>name</i>	<a href="#">Overlap</a> name.
<i>primer</i>	Primer sequence.

5.17.2.3 `Mufasa.BackEnd.Designer.Overlap.Overlap ( Overlap overlap )`

[Overlap](#) copying constructor.

## Parameters

<i>overlap</i>	<a href="#">Overlap</a> .
----------------	---------------------------

## 5.17.3 Member Function Documentation

5.17.3.1 `static void Mufasa.BackEnd.Designer.Overlap.CalculateHeterodimers ( List< Overlap > overlaps ) [static]`

Calculate heterodimer melting temperatures.

## Parameters

<i>overlaps</i>	<a href="#">Overlap</a> list.
-----------------	-------------------------------

5.17.3.2 `byte Mufasa.BackEnd.Designer.Overlap.Dequeue ( int minLen, int length = 1 )`

Cut the first nucleotide off.

## Parameters

<i>minLen</i>	Minimum overhang length.
---------------	--------------------------

## Returns

First nucleotide or 255 if oligo too short to dequeue.

5.17.3.3 `byte Mufasa.BackEnd.Designer.Overlap.Enqueue ( int maxLen, int length = 1 )`

Add a nucleotide to the oligo's 5' end.

## Parameters

<i>maxLen</i>	Maximum overhang length.
---------------	--------------------------

**Returns**

New nucleotide or 255 if oligo too long to enqueue.

#### 5.17.3.4 `double Mufasa.BackEnd.Designer.Overlap.GetDuplexTemperature ( Overlap twin )`

Compute overlap's duplex melting temperature.

**Returns**

Duplex melting temperature.

#### 5.17.3.5 `double Mufasa.BackEnd.Designer.Overlap.GetSimpleMeltingTemperature ( )`

Compute overlap's simple-style melting temperature.

**Returns**

[Overlap](#)'s Tm.

#### 5.17.3.6 `bool Mufasa.BackEnd.Designer.Overlap.IsAcceptable ( double maxTh, double maxTd, bool ignoreHeterodimers = false )`

Check if the overlap's melting temperatures satisfy the conditions.

**Parameters**

<i>maxTh</i>	Max hairpin melting temperature.
<i>maxTd</i>	Max duplex melting temperature.
<i>consider↔ Heterodimers</i>	

**Returns**

True if the overlap is acceptable.

#### 5.17.3.7 `byte Mufasa.BackEnd.Designer.Overlap.Pop ( int minLen, int length = 1 )`

Cut the last nucleotide of.

**Parameters**

<i>minLen</i>	Minimum primer length.
---------------	------------------------

**Returns**

Last nucleotide or 255 if oligo too short to pop.

#### 5.17.3.8 `byte Mufasa.BackEnd.Designer.Overlap.Push ( int maxLen, int length = 1 )`

Add a nucleotide to the oligo's 3' end.



## Parameters

<i>maxLen</i>	Maximum primer length.
---------------	------------------------

## Returns

New nucleotide or 255 if oligo too long to push.

## 5.17.3.9 string Mufasa.BackEnd.Designer.Overlap.ToCsv ( )

Prints the overlap in the CSV format.

## Returns

CSV String represanting the overlap.

## 5.17.3.10 override string Mufasa.BackEnd.Designer.Overlap.ToString ( )

Prints the overlap info.

## Returns

String represanting the overlap.

## 5.17.4 Property Documentation

## 5.17.4.1 double Mufasa.BackEnd.Designer.Overlap.HairpinMeltingTemperature [get]

[Overlap](#)'s hairpin melting temperature.

## 5.17.4.2 double Mufasa.BackEnd.Designer.Overlap.HeterodimerMeltingTemperature [get], [set]

[Overlap](#) heterodimer melting temperature.

## 5.17.4.3 double Mufasa.BackEnd.Designer.Overlap.HomodimerMeltingTemperature [get]

[Overlap](#) homodimer melting temperature.

## 5.17.4.4 double Mufasa.BackEnd.Designer.Overlap.MeltingTemperature [get]

[Overlap](#) melting temperature.

## 5.17.4.5 int Mufasa.BackEnd.Designer.Overlap.PairIndex [get], [set]

Paired overlap index.

## 5.17.4.6 ISequence Mufasa.BackEnd.Designer.Overlap.Seq\_3 [get], [set]

3' ("gene-specific") subsequence.

5.17.4.7 `ISequence Mufasa.BackEnd.Designer.Overlap.Seq_5` [get], [set]

5' ("overhang") subsequence.

5.17.4.8 `String Mufasa.BackEnd.Designer.Overlap.SequenceString` [get]

Sequence string.

5.17.4.9 `TmThalSettings Mufasa.BackEnd.Designer.Overlap.Settings` [get], [set]

Settings for thermodynamic evaluation.

5.17.4.10 `ISequence Mufasa.BackEnd.Designer.Overlap.TemplateSeq_3` [get], [set]

3' ("gene-specific") subsequence template.

5.17.4.11 `ISequence Mufasa.BackEnd.Designer.Overlap.TemplateSeq_5` [get], [set]

5' ("overhang") subsequence template.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Designer/Overlap.cs

## 5.18 Mufasa.BackEnd.Designer.OverlapOptimizer Class Reference

### Public Member Functions

- [OverlapOptimizer](#) ()  
*Overlap optimizer constructor.*
- [OverlapOptimizer](#) ([Construct](#) construct, [DesignerSettings](#) settings)  
*Overlap optimizer constructor.*
- void [LeaOptimizeOverlaps](#) (object o, DoWorkEventArgs args)  
*Lamarckian evolutionary algorithm for overlap optimization.*
- void [Stop](#) ()  
*Stop the calculations.*
- void [SemiNaiveOptimizeOverlaps](#) (object o, DoWorkEventArgs args)  
*Overlap naive-greedy temperature optimization.*

### Properties

- [Construct](#) [Construct](#) [get, set]
- bool [IgnorePreoptimizationExceptions](#) [get, set]
- List< [Overlap](#) > [Templates](#) [get, set]
- [DesignerSettings](#) [Settings](#) [get, set]

#### 5.18.1 Detailed Description

[Overlap](#) optimizer class.

## 5.18.2 Constructor & Destructor Documentation

### 5.18.2.1 Mufasa.BackEnd.Designer.OverlapOptimizer.OverlapOptimizer ( )

[Overlap](#) optimizer constructor.

### 5.18.2.2 Mufasa.BackEnd.Designer.OverlapOptimizer.OverlapOptimizer ( Construct *construct*, DesignerSettings *settings* )

[Overlap](#) optimizer constructor.

Parameters

<i>construct</i>	A construct to assemble.
------------------	--------------------------

## 5.18.3 Member Function Documentation

### 5.18.3.1 void Mufasa.BackEnd.Designer.OverlapOptimizer.LeaOptimizeOverlaps ( object *o*, DoWorkEventArgs *args* )

Lamarckian evolutionary algorithm for overlap optimization.

Parameters

<i>o</i>	
<i>args</i>	

### 5.18.3.2 void Mufasa.BackEnd.Designer.OverlapOptimizer.SemiNaiveOptimizeOverlaps ( object *o*, DoWorkEventArgs *args* )

[Overlap](#) naive-greedy temperature optimization.

Parameters

<i>o</i>	
<i>args</i>	

### 5.18.3.3 void Mufasa.BackEnd.Designer.OverlapOptimizer.Stop ( )

Stop the calculations.

## 5.18.4 Property Documentation

### 5.18.4.1 Construct Mufasa.BackEnd.Designer.OverlapOptimizer.Construct [get], [set]

A construct to assemble.

### 5.18.4.2 bool Mufasa.BackEnd.Designer.OverlapOptimizer.IgnorePreoptimizationExceptions [get], [set]

True to ignore unacceptable solutions during the preoptimization stage.

### 5.18.4.3 DesignerSettings Mufasa.BackEnd.Designer.OverlapOptimizer.Settings [get], [set]

[Designer](#) settings.

5.18.4.4 `List<Overlap> Mufasa.BackEnd.Designer.OverlapOptimizer.Templates` `[get]`, `[set]`

[Overlap](#) templates.

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

- `C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Designer/OverlapOptimizer.cs`

## 5.19 Mufasa.BackEnd.TmThal.Thermodynamics.p3\_thal\_args Struct Reference

Structure for passing arguments to THERMODYNAMIC ALIGNMENT calculation.

### Public Attributes

- `int debug`  
*If non zero, print debugging info to stderr.*
- `p3_thal_alignment_type type`  
*Alignment type. THAL\_ANY, by default. See p3\_thal\_alignment\_type*
- `int maxLoop`  
*Maximum size of loop to consider; longer than 30 bp are not allowed.*
- `double mv`  
*Concentration of monovalent cations.*
- `double dv`  
*Concentration of divalent cations.*
- `double dntp`  
*Concentration of dNTP-s.*
- `double dna_conc`  
*Concentration of oligonucleotides.*
- `double temp`  
*Temperature from which hairpin structures will be calculated.*
- `int temponly`  
*If non zero, print only temperature to stderr.*
- `int dimer`  
*If non zero, dimer structure is calculated.*

### 5.19.1 Detailed Description

Structure for passing arguments to THERMODYNAMIC ALIGNMENT calculation.

### 5.19.2 Member Data Documentation

5.19.2.1 `int Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.debug`

If non zero, print debugging info to stderr.

5.19.2.2 `int Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.dimer`

If non zero, dimer structure is calculated.

5.19.2.3 `double Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.dna_conc`

Concentration of oligonucleotides.

5.19.2.4 `double Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.dntp`

Concentration of dNTP-s.

5.19.2.5 `double Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.dv`

Concentration of divalent cations.

5.19.2.6 `int Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.maxLoop`

Maximum size of loop to consider; longer than 30 bp are not allowed.

5.19.2.7 `double Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.mv`

Concentration of monovalent cations.

5.19.2.8 `double Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.temp`

Temperature from which hairpin structures will be calculated.

5.19.2.9 `int Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.temponly`

If non zero, print only temperature to stderr.

5.19.2.10 `p3_thal_alignment_type Mufasa.BackEnd.TmThal.Thermodynamics.p3_thal_args.type`

Alignment type. THAL\_ANY, by default. See `p3_thal_alignment_type`

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

- `C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/TmThal/Thermodynamics.cs`

## 5.20 Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args Struct Reference

Primer3's thal arguments structure.

### Public Attributes

- `double dna_conc`  
*DNA concentration (nanomolar).*
- `double salt_conc`  
*Concentration of divalent cations (millimolar).*
- `double divalent_conc`  
*Concentration of divalent cations (millimolar).*
- `double dntp_conc`

*Concentration of dNTPs (millimolar).*

- int [nn\\_max\\_len](#)

*The maximum sequence length for using the nearest neighbor model (as implemented in oligotm. For sequences longer than this, seqtm uses the "GC%" formula implemented in long\_seq\_tm.*

- p3\_tm\_method\_type [tm\\_method](#)

*Melting temperature computation method. See p3\_tm\_method\_type*

- p3\_salt\_correction\_type [salt\\_corrections](#)

*Melting temperature method. See p3\_salt\_correction\_type*

### 5.20.1 Detailed Description

Primer3's thal arguments structure.

### 5.20.2 Member Data Documentation

#### 5.20.2.1 double Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.divalent\_conc

Concentration of divalent cations (millimolar).

#### 5.20.2.2 double Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.dna\_conc

DNA concentration (nanomolar).

#### 5.20.2.3 double Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.dntp\_conc

Concentration of dNTPs (millimolar).

#### 5.20.2.4 int Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.nn\_max\_len

The maximum sequence length for using the nearest neighbor model (as implemented in oligotm. For sequences longer than this, seqtm uses the "GC%" formula implemented in long\_seq\_tm.

#### 5.20.2.5 double Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.salt\_conc

Concentration of divalent cations (millimolar).

#### 5.20.2.6 p3\_salt\_correction\_type Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.salt\_corrections

Melting temperature method. See p3\_salt\_correction\_type

#### 5.20.2.7 p3\_tm\_method\_type Mufasa.BackEnd.TmThal.Thermodynamics.p3\_tm\_args.tm\_method

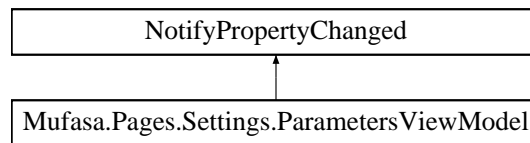
Melting temperature computation method. See p3\_tm\_method\_type

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/TmThal/Thermodynamics.cs

## 5.21 Mufasa.Pages.Settings.ParametersViewModel Class Reference

Inheritance diagram for Mufasa.Pages.Settings.ParametersViewModel:



### Properties

- string[] [TmMethods](#) [get]  
*Available tm calculation methods.*
- string[] [SaltCorrMethods](#) [get]  
*Available salt correction methods.*
- string [SelectedTmMethod](#) [get, set]
- string [SelectedSaltCorrMethod](#) [get, set]

### 5.21.1 Property Documentation

5.21.1.1 string [] Mufasa.Pages.Settings.ParametersViewModel.SaltCorrMethods [get]

Available salt correction methods.

5.21.1.2 string Mufasa.Pages.Settings.ParametersViewModel.SelectedSaltCorrMethod [get], [set]

Selected salt correction method.

5.21.1.3 string Mufasa.Pages.Settings.ParametersViewModel.SelectedTmMethod [get], [set]

Selected tm calculation method.

5.21.1.4 string [] Mufasa.Pages.Settings.ParametersViewModel.TmMethods [get]

Available tm calculation methods.

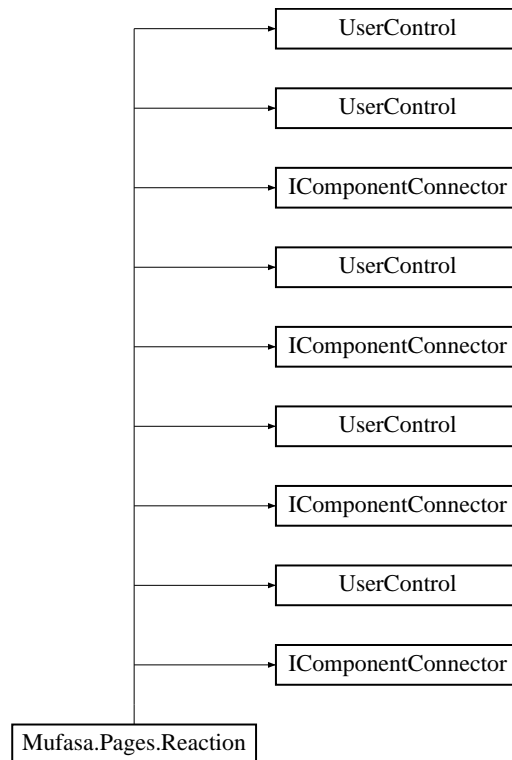
The documentation for this class was generated from the following file:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Settings/ParametersViewModel.cs

## 5.22 Mufasa.Pages.Reaction Class Reference

### Reaction

Inheritance diagram for Mufasa.Pages.Reaction:



## Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

## Properties

- ListCollectionView **Fragments** [get, set]

### 5.22.1 Detailed Description

#### [Reaction](#)

Interaction logic for Reaction.xaml

### 5.22.2 Member Function Documentation

#### 5.22.2.1 void Mufasa.Pages.Reaction.InitializeComponent ( )

InitializeComponent



5.22.2.2 void Mufasa.Pages.Reaction.InitializeComponent ( )

InitializeComponent

5.22.2.3 void Mufasa.Pages.Reaction.InitializeComponent ( )

InitializeComponent

5.22.2.4 void Mufasa.Pages.Reaction.InitializeComponent ( )

InitializeComponent

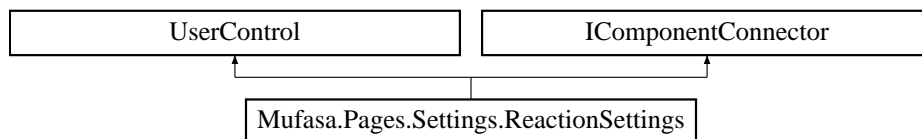
The documentation for this class was generated from the following files:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Reaction.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Reaction.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Reaction.xaml.cs

## 5.23 Mufasa.Pages.Settings.ReactionSettings Class Reference

### [ReactionSettings](#)

Inheritance diagram for Mufasa.Pages.Settings.ReactionSettings:



### Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.23.1 Detailed Description

#### [ReactionSettings](#)

### 5.23.2 Member Function Documentation

5.23.2.1 void Mufasa.Pages.Settings.ReactionSettings.InitializeComponent ( )

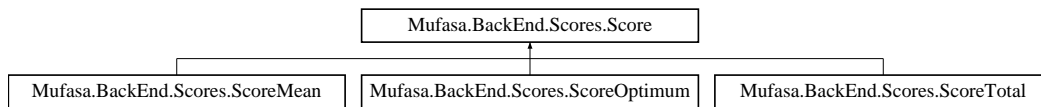
InitializeComponent

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/ReactionSettings.g.i.cs

## 5.24 Mufasa.BackEnd.Scores.Score Class Reference

Inheritance diagram for Mufasa.BackEnd.Scores.Score:



### Public Member Functions

- [Score](#) ([Score](#) s)  
*Score copying constructor.*
- [Score](#) ()
- abstract void [Rescore](#) (List< [Overlap](#) > overlaps)  
*Scoring function.*
- string [ToCsv](#) ()  
*Prints the overlap in the CSV format.*

### Properties

- double [RawScore](#) [get, protected set]  
*Raw score.*
- double [NormalizedScore](#) [get, protected set]  
*Normalized Score.*
- String [Label](#) [get, set]  
*Score label or name*
- String [Description](#) [get, set]  
*Score description*

### 5.24.1 Constructor & Destructor Documentation

#### 5.24.1.1 Mufasa.BackEnd.Scores.Score.Score ( [Score](#) s )

[Score](#) copying constructor.

Parameters

s	<a href="#">Score</a> to copy.
---	--------------------------------

#### 5.24.1.2 Mufasa.BackEnd.Scores.Score.Score ( )

[Score](#) copying constructor.

### 5.24.2 Member Function Documentation

#### 5.24.2.1 abstract void Mufasa.BackEnd.Scores.Score.Rescore ( List< [Overlap](#) > overlaps ) [pure virtual]

Scoring function.

## Parameters

<i>overlaps</i>	Overlap list.
-----------------	---------------

Implemented in [Mufasa.BackEnd.Scores.ScoreTotal](#), [Mufasa.BackEnd.Scores.ScoreOptimum](#), and [Mufasa.BackEnd.Scores.ScoreMean](#).

## 5.24.2.2 string Mufasa.BackEnd.Scores.Score.ToCsv ( )

Prints the overlap in the CSV format.

## Returns

CSV String represanting the overlap.

## 5.24.3 Property Documentation

## 5.24.3.1 String Mufasa.BackEnd.Scores.Score.Description [get], [set]

[Score](#) description

## 5.24.3.2 String Mufasa.BackEnd.Scores.Score.Label [get], [set]

[Score](#) label or name

## 5.24.3.3 double Mufasa.BackEnd.Scores.Score.NormalizedScore [get], [protected set]

Normalized [Score](#).

## 5.24.3.4 double Mufasa.BackEnd.Scores.Score.RawScore [get], [protected set]

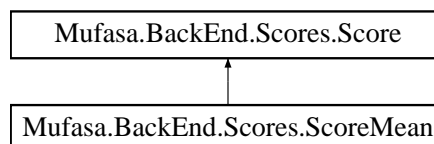
Raw score.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Scores/Score.cs

## 5.25 Mufasa.BackEnd.Scores.ScoreMean Class Reference

Inheritance diagram for Mufasa.BackEnd.Scores.ScoreMean:



## Public Member Functions

- [ScoreMean](#) ()  
*ScoreMean* constructor.
- [ScoreMean](#) (List< [Overlap](#) > overlaps)

- [ScoreMean](#) constructor.
- [ScoreMean](#) ([ScoreMean](#) s)
- [ScoreMean](#) copying constructor.
- override void [Rescore](#) (List< [Overlap](#) > overlaps)
- [Scoring function](#).

## Additional Inherited Members

### 5.25.1 Constructor & Destructor Documentation

#### 5.25.1.1 Mufasa.BackEnd.Scores.ScoreMean.ScoreMean ( )

[ScoreMean](#) constructor.

#### 5.25.1.2 Mufasa.BackEnd.Scores.ScoreMean.ScoreMean ( List< [Overlap](#) > overlaps )

[ScoreMean](#) constructor.

#### 5.25.1.3 Mufasa.BackEnd.Scores.ScoreMean.ScoreMean ( [ScoreMean](#) s )

[ScoreMean](#) copying constructor.

Parameters

s	<a href="#">Score</a> to copy.
---	--------------------------------

### 5.25.2 Member Function Documentation

#### 5.25.2.1 override void Mufasa.BackEnd.Scores.ScoreMean.Rescore ( List< [Overlap](#) > overlaps ) [virtual]

[Scoring function](#).

Parameters

overlaps	Overlap list.
----------	---------------

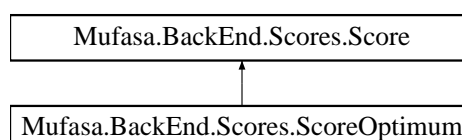
Implements [Mufasa.BackEnd.Scores.Score](#).

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Scores/ScoreMean.cs

## 5.26 Mufasa.BackEnd.Scores.ScoreOptimum Class Reference

Inheritance diagram for Mufasa.BackEnd.Scores.ScoreOptimum:



## Public Member Functions

- [ScoreOptimum](#) (double targetTm)  
*ScoreMean constructor.*
- [ScoreOptimum](#) (List< [Overlap](#) > overlaps, double targetTm)  
*ScoreMean constructor.*
- [ScoreOptimum](#) ([ScoreOptimum](#) s)  
*ScoreOptimum copying constructor.*
- override void [Rescore](#) (List< [Overlap](#) > overlaps)  
*Scoring function.*

## Properties

- double [TargetTm](#) [get, set]  
*Target melting temperature.*

### 5.26.1 Constructor & Destructor Documentation

#### 5.26.1.1 Mufasa.BackEnd.Scores.ScoreOptimum.ScoreOptimum ( double targetTm )

[ScoreMean](#) constructor.

#### 5.26.1.2 Mufasa.BackEnd.Scores.ScoreOptimum.ScoreOptimum ( List< [Overlap](#) > overlaps, double targetTm )

[ScoreMean](#) constructor.

#### 5.26.1.3 Mufasa.BackEnd.Scores.ScoreOptimum.ScoreOptimum ( [ScoreOptimum](#) s )

[ScoreOptimum](#) copying constructor.

Parameters

s	<a href="#">Score</a> to copy.
---	--------------------------------

### 5.26.2 Member Function Documentation

#### 5.26.2.1 override void Mufasa.BackEnd.Scores.ScoreOptimum.Rescore ( List< [Overlap](#) > overlaps ) [virtual]

Scoring function.

Parameters

<i>overlaps</i>	Overlap list.
<i>targetTm</i>	Target melting temperature.

Implements [Mufasa.BackEnd.Scores.Score](#).

### 5.26.3 Property Documentation

#### 5.26.3.1 double Mufasa.BackEnd.Scores.ScoreOptimum.TargetTm [get], [set]

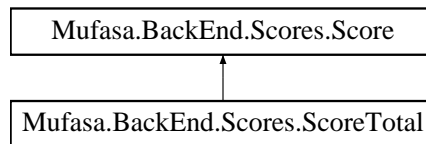
Target melting temperature.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Scores/ScoreOptimum.cs

## 5.27 Mufasa.BackEnd.Scores.ScoreTotal Class Reference

Inheritance diagram for Mufasa.BackEnd.Scores.ScoreTotal:



### Public Member Functions

- **ScoreTotal** (List< **Overlap** > overlaps, double targetTm)  
*Score constructor.*
- **ScoreTotal** ()  
*Empty Score constructor for unacceptable solutions.*
- **ScoreTotal** (double targetTm)  
*Empty Score constructor for unscored solutions.*
- **ScoreTotal** (**ScoreTotal** s)  
*ScoreTotal copying constructor.*
- override void **Rescore** (List< **Overlap** > overlaps)  
*Scoring function.*

### Static Public Attributes

- static **ScoreTotal Inacceptable** = new **ScoreTotal**()

### Properties

- **ScoreMean Sm** [get]  
*ScoreMean partial score.*
- **ScoreOptimum So** [get]  
*ScoreOptimum partial score.*
- double **TargetTm** [get, set]  
*Target melting temperature.*

#### 5.27.1 Constructor & Destructor Documentation

##### 5.27.1.1 Mufasa.BackEnd.Scores.ScoreTotal.ScoreTotal ( List< **Overlap** > overlaps, double targetTm )

**Score** constructor.

Parameters

<i>overlaps</i>	Overlap list.
-----------------	---------------

<i>targetTm</i>	Target melting temperature.
-----------------	-----------------------------

#### 5.27.1.2 Mufasa.BackEnd.Scores.ScoreTotal.ScoreTotal ( )

Empty [Score](#) constructor for unacceptable solutions.

#### 5.27.1.3 Mufasa.BackEnd.Scores.ScoreTotal.ScoreTotal ( double *targetTm* )

Empty [Score](#) constructor for unscored solutions.

#### 5.27.1.4 Mufasa.BackEnd.Scores.ScoreTotal.ScoreTotal ( [ScoreTotal](#) *s* )

[ScoreTotal](#) copying constructor.

Parameters

<i>s</i>	<a href="#">Score</a> to copy.
----------	--------------------------------

### 5.27.2 Member Function Documentation

#### 5.27.2.1 override void Mufasa.BackEnd.Scores.ScoreTotal.Rescore ( [List](#)< [Overlap](#) > *overlaps* ) [virtual]

Scoring function.

Parameters

<i>overlaps</i>	Overlap list.
-----------------	---------------

Implements [Mufasa.BackEnd.Scores.Score](#).

### 5.27.3 Property Documentation

#### 5.27.3.1 [ScoreMean](#) Mufasa.BackEnd.Scores.ScoreTotal.Sm [get]

[ScoreMean](#) partial score.

#### 5.27.3.2 [ScoreOptimum](#) Mufasa.BackEnd.Scores.ScoreTotal.So [get]

[ScoreOptimum](#) partial score.

#### 5.27.3.3 double Mufasa.BackEnd.Scores.ScoreTotal.TargetTm [get], [set]

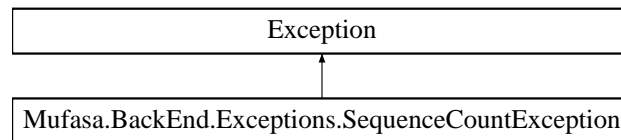
Target melting temperature.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Scores/ScoreTotal.cs

## 5.28 Mufasa.BackEnd.Exceptions.SequenceCountException Class Reference

Inheritance diagram for Mufasa.BackEnd.Exceptions.SequenceCountException:



## Public Member Functions

- [SequenceCountException](#) ()  
*SequenceCountException constructor.*
- [SequenceCountException](#) (string message)  
*SequenceCountException constructor.*

### 5.28.1 Detailed Description

Exception thrown if sequence count in a file is invalid. BackEnd.Designer.Designer.cs

### 5.28.2 Constructor & Destructor Documentation

#### 5.28.2.1 Mufasa.BackEnd.Exceptions.SequenceCountException.SequenceCountException ( )

[SequenceCountException](#) constructor.

#### 5.28.2.2 Mufasa.BackEnd.Exceptions.SequenceCountException.SequenceCountException ( string message )

[SequenceCountException](#) constructor.

#### Parameters

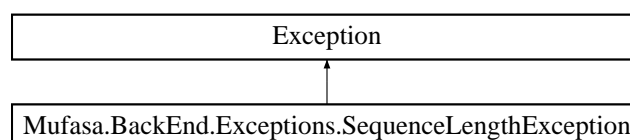
<i>message</i>	Message to send.
----------------	------------------

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Exceptions/SequenceCountException.↵  
cs

## 5.29 Mufasa.BackEnd.Exceptions.SequenceLengthException Class Reference

Inheritance diagram for Mufasa.BackEnd.Exceptions.SequenceLengthException:



## Public Member Functions

- [SequenceLengthException](#) ()  
*SequenceLengthException constructor.*
- [SequenceLengthException](#) (string message)



- [SequenceLengthException](#) constructor.
- [SequenceLengthException](#) (string message, ISequence sequence)  
[SequenceLengthException](#) constructor.

## Properties

- ISequence [Sequence](#) [get, set]  
*Sequence in question.*

### 5.29.1 Detailed Description

Exception thrown if sequence length in a file is invalid. BackEnd.Designer.Designer.cs

### 5.29.2 Constructor & Destructor Documentation

#### 5.29.2.1 Mufasa.BackEnd.Exceptions.SequenceLengthException.SequenceLengthException ( )

[SequenceLengthException](#) constructor.

#### 5.29.2.2 Mufasa.BackEnd.Exceptions.SequenceLengthException.SequenceLengthException ( string message )

[SequenceLengthException](#) constructor.

##### Parameters

<i>message</i>	Message to send.
----------------	------------------

#### 5.29.2.3 Mufasa.BackEnd.Exceptions.SequenceLengthException.SequenceLengthException ( string message, ISequence sequence )

[SequenceLengthException](#) constructor.

##### Parameters

<i>message</i>	Message to send.
<i>sequence</i>	Sequence in question.

### 5.29.3 Property Documentation

#### 5.29.3.1 ISequence Mufasa.BackEnd.Exceptions.SequenceLengthException.Sequence [get], [set]

Sequence in question.

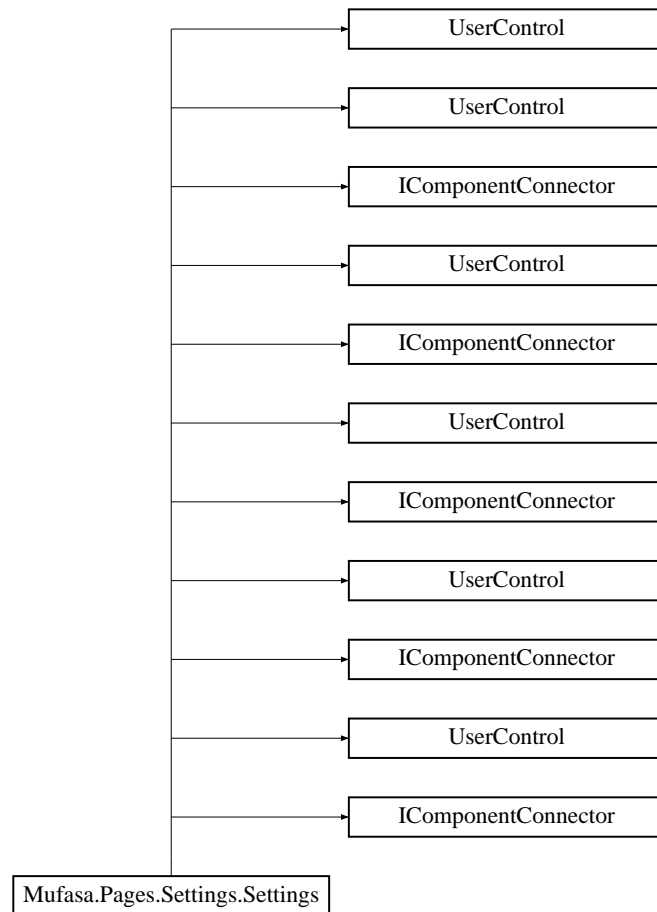
The documentation for this class was generated from the following file:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Exceptions/SequenceLengthException.cs

## 5.30 Mufasa.Pages.Settings.Settings Class Reference

### Settings

Inheritance diagram for Mufasa.Pages.Settings.Settings:



## Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.30.1 Detailed Description

#### [Settings](#)

Interaction logic for DesignerSettings.xaml

### 5.30.2 Member Function Documentation

#### 5.30.2.1 void `Mufasa.Pages.Settings.Settings.InitializeComponent` ( )

`InitializeComponent`

5.30.2.2 void Mufasa.Pages.Settings.Settings.InitializeComponent ( )

InitializeComponent

5.30.2.3 void Mufasa.Pages.Settings.Settings.InitializeComponent ( )

InitializeComponent

5.30.2.4 void Mufasa.Pages.Settings.Settings.InitializeComponent ( )

InitializeComponent

5.30.2.5 void Mufasa.Pages.Settings.Settings.InitializeComponent ( )

InitializeComponent

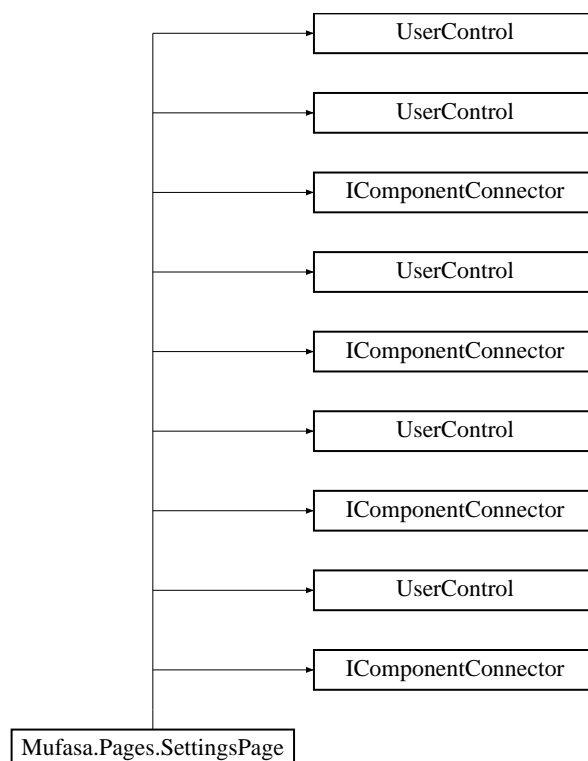
The documentation for this class was generated from the following files:

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/Parameters.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/Parameters.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/Settings/Settings.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/Settings/Parameters.xaml.cs

## 5.31 Mufasa.Pages.SettingsPage Class Reference

### [SettingsPage](#)

Inheritance diagram for Mufasa.Pages.SettingsPage:



## Public Member Functions

- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*
- void [InitializeComponent](#) ()  
*InitializeComponent*

### 5.31.1 Detailed Description

#### [SettingsPage](#)

Interaction logic for SettingsPage.xaml

### 5.31.2 Member Function Documentation

#### 5.31.2.1 void Mufasa.Pages.SettingsPage.InitializeComponent ( )

InitializeComponent

#### 5.31.2.2 void Mufasa.Pages.SettingsPage.InitializeComponent ( )

InitializeComponent

#### 5.31.2.3 void Mufasa.Pages.SettingsPage.InitializeComponent ( )

InitializeComponent

#### 5.31.2.4 void Mufasa.Pages.SettingsPage.InitializeComponent ( )

InitializeComponent

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/SettingsPage.g.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/obj/Debug/Pages/SettingsPage.g.i.cs
- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/SettingsPage.xaml.cs

## 5.32 Mufasa.BackEnd.TmThal.Thermodynamics.thal\_results Struct Reference

Structure for receiving results from the thermodynamic alignment calculation.

### Public Attributes

- char[] [msg](#)  
*Message.*
- double [temp](#)  
*Melting temperature.*

- int [align\\_end\\_1](#)  
*Alignment end 1.*
- int [align\\_end\\_2](#)  
*Alignment end 2.*

### 5.32.1 Detailed Description

Structure for receiving results from the thermodynamic alignment calculation.

### 5.32.2 Member Data Documentation

#### 5.32.2.1 int Mufasa.BackEnd.TmThal.Thermodynamics.thal\_results.align\_end\_1

Alignment end 1.

#### 5.32.2.2 int Mufasa.BackEnd.TmThal.Thermodynamics.thal\_results.align\_end\_2

Alignment end 2.

#### 5.32.2.3 char [] Mufasa.BackEnd.TmThal.Thermodynamics.thal\_results.msg

Message.

#### 5.32.2.4 double Mufasa.BackEnd.TmThal.Thermodynamics.thal\_results.temp

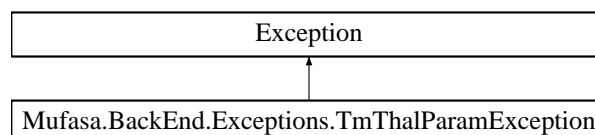
Melting temperature.

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/TmThal/Thermodynamics.cs

## 5.33 Mufasa.BackEnd.Exceptions.TmThalParamException Class Reference

Inheritance diagram for Mufasa.BackEnd.Exceptions.TmThalParamException:



### Public Member Functions

- [TmThalParamException](#) ()  
*TmThalParamException constructor.*
- [TmThalParamException](#) (string message)  
*TmThalParamException constructor.*

### 5.33.1 Detailed Description

Exception thrown if failed to load Primer3's thermodynamic parameters. BackEnd.Designer.Designer.cs

### 5.33.2 Constructor & Destructor Documentation

#### 5.33.2.1 Mufasa.BackEnd.Exceptions.TmThalParamException.TmThalParamException ( )

[TmThalParamException](#) constructor.

#### 5.33.2.2 Mufasa.BackEnd.Exceptions.TmThalParamException.TmThalParamException ( string message )

[TmThalParamException](#) constructor.

Parameters

<i>message</i>	Message to send.
----------------	------------------

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/Exceptions/TmThalParamException.↵  
cs

## 5.34 Mufasa.BackEnd.TmThal.TmThalSettings Class Reference

### Public Member Functions

- [TmThalSettings](#) (double dnaConc=50.0, double dntpConc=0.8, double mvConc=50.0, double dvConc=1.↵  
5, int nnMaxLen=60, Thermodynamics.p3\_tm\_method\_type tmMethod=Thermodynamics.p3\_tm\_method\_↵  
type.p3\_santalucia\_auto, Thermodynamics.p3\_salt\_correction\_type saltMethod=Thermodynamics.p3\_salt\_↵  
\_correction\_type.p3\_santalucia, int maxLoop=30)  
[TmThalSettings](#) constructor.

### Properties

- [Thermodynamics.p3\\_tm\\_args TmSettings](#) [get]  
*TmThal.p3\_thal settings for duplex calculation*
- [Thermodynamics.p3\\_thal\\_args ThalSettings](#) [get]  
*TmThal.p3\_thal settings for duplex calculation*
- [Thermodynamics.p3\\_thal\\_args ThalHairpinSettings](#) [get]  
*TmThal.p3\_thal settings for duplex calculation*
- [Thermodynamics.p3\\_salt\\_correction\\_type SaltCorrectionMethod](#) [get, set]  
*Salt correction method. See Thermodynamics.p3\_salt\_correction\_type*
- [Thermodynamics.p3\\_tm\\_method\\_type TmMethod](#) [get, set]  
*Melting temperature computation method. See Thermodynamics.p3\_tm\_method\_type*
- int [MaxLoop](#) [get, set]  
*Maximum size of loop to consider; longer than 30 bp are not allowed.*
- int [NnMaxLen](#) [get, set]  
*Max oligo length for Nearest Neighbor-model computations.*
- double [DnaConcentration](#) [get, set]  
*DNA concentration.*
- double [DntpConcentration](#) [get, set]

- dNTP concentration.*
- double [DivalentConcentration](#) [get, set]  
*Divalent [Mg2+] cations concentration.*
- double [MonovalentConcentration](#) [get, set]  
*Monovalent [Na+/K+] cations concentration.*

### 5.34.1 Constructor & Destructor Documentation

5.34.1.1 **Mufasa.BackEnd.TmThal.TmThalSettings.TmThalSettings** ( double *dnaConc* = 50.0, double *dntpConc* = 0.8, double *mvConc* = 50.0, double *dvConc* = 1.5, int *nnMaxLen* = 60, Thermodynamics.p3\_tm\_method\_type *tmMethod* = Thermodynamics.p3\_tm\_method\_type.p3\_santalucia\_auto, Thermodynamics.p3\_salt\_correction\_type *saltMethod* = Thermodynamics.p3\_salt\_correction\_type.p3\_santalucia, int *maxLoop* = 30 )

[TmThalSettings](#) constructor.

Parameters

<i>dnaConc</i>	DNA concentration. Assume primer3's default.
<i>dntpConc</i>	dNTP-s concentration. (Qian & Tian, 2014): 0.8 mM.
<i>mvConc</i>	Monovalent cations concentration. Assume phusion buffer.
<i>dvConc</i>	Divalent cations concentration. Assume phusion buffer.
<i>nnMaxLen</i>	Max oligo length fo NN-model computations.
<i>tmMethod</i>	Melting temperature method. See <a href="#">TmThalSettings.TmMethod</a>
<i>saltMethod</i>	Salt correction method. See <a href="#">TmThalSettings.SaltCorrectionMethod</a>
<i>temperature</i>	Reaction temperature. Annealing temperature for CPEC reaction (Qian & Tian, 2014), as it is constant and lower than suggested annealing temperature for the PCR step ( $T_m + 3$ ).
<i>thalType</i>	Thermodynamic alignment type. See <a href="#">TmThalSettings.ThermoAlignmentType</a> . ANY by default.
<i>maxLoop</i>	Max hairpin loop size to consider.

### 5.34.2 Property Documentation

5.34.2.1 double **Mufasa.BackEnd.TmThal.TmThalSettings.DivalentConcentration** [get], [set]

Divalent [Mg2+] cations concentration.

5.34.2.2 double **Mufasa.BackEnd.TmThal.TmThalSettings.DnaConcentration** [get], [set]

DNA concentration.

5.34.2.3 double **Mufasa.BackEnd.TmThal.TmThalSettings.DntpConcentration** [get], [set]

dNTP concentration.

5.34.2.4 int **Mufasa.BackEnd.TmThal.TmThalSettings.MaxLoop** [get], [set]

Maximum size of loop to consider; longer than 30 bp are not allowed.

5.34.2.5 double **Mufasa.BackEnd.TmThal.TmThalSettings.MonovalentConcentration** [get], [set]

Monovalent [Na+/K+] cations concentration.

#### 5.34.2.6 `int Mufasa.BackEnd.TmThal.TmThalSettings.NnMaxLen` `[get]`, `[set]`

Max oligo length for Nearest Neighbor-model computations.

Default = 60. The rationale behind this value (60) is that this is the maximum reasonable length for nearest neighbor models. It is the maximum length at which we can restrict our model to only two states of melting: fully intact duplex or completely dissociated single strands.

(But: defined as `MAX_PRIMER_LENGTH = 36` in primer3's `libprimer.c` for melting temperature computations)

Both functions return the melting temperature of the given oligo calculated as specified by user, NN-model *should* only be used on DNA sequences of length  $\leq$  `NnMaxLen`. `seqtm` uses NN-model for sequences of length  $\leq$  `NnMaxLen`, and a different, G+C% based formula for longer sequences. For NN-model, no error is generated on sequences longer than `NnMaxLen`, but the formula becomes less accurate as the sequence grows longer. Caveat emptor.

If oligo length  $>$  `NnMaxLen`, calculate the melting temperature of `substr(seq, start, length)` using the formula from Bolton and McCarthy, PNAS 84:1390 (1962) as presented in Sambrook, Fritsch and Maniatis, Molecular Cloning, p 11.46 (1989, CSHL Press).

$$T_m = 81.5 + 16.6(\log_{10}([Na^+])) + .41*(GC) - 600/\text{length}$$

Where `[Na+]` is the molar sodium concentration, `(GC)` is the percent of Gs and Cs in the sequence, and `length` is the length of the sequence.

#### 5.34.2.7 `Thermodynamics.p3_salt_correction_type Mufasa.BackEnd.TmThal.TmThalSettings.SaltCorrectionMethod` `[get]`, `[set]`

Salt correction method. See `Thermodynamics.p3_salt_correction_type`

If `salt_corrections==schildkraut`, then formula for salt correction in the paper [Schildkraut, C, and Lifson, S (1965) "Dependence of the melting temperature of DNA on salt concentration", Biopolymers 3:195-208 (not available online)] is used. This is the formula that primer3 used up to and including version 1.0.1.

If `salt_corrections==santalucia`, then formula for salt correction suggested by the paper [SantaLucia JR (1998) "A unified view of polymer, dumbbell and oligonucleotide DNA nearest-neighbor thermodynamics", Proc Natl Acad Sci 95:1460-65 <http://dx.doi.org/10.1073/pnas.95.4.1460>] is used.

*THIS IS THE RECOMMENDED VALUE.*

If `salt_corrections==owczarzy`, then formula for salt correction in the paper [Owczarzy, R., Moreira, B.G., You, Y., Behlke, M.A., and Walder, J.A. (2008) "Predicting stability of DNA duplexes in solutions containing magnesium and monovalent cations", Biochemistry 47:5336-53 <http://dx.doi.org/10.1021/bi702363u>] is used.

#### 5.34.2.8 `Thermodynamics.p3_thal_args Mufasa.BackEnd.TmThal.TmThalSettings.ThalHairpinSettings` `[get]`

`TmThal.p3_thal` settings for duplex calculation

#### 5.34.2.9 `Thermodynamics.p3_thal_args Mufasa.BackEnd.TmThal.TmThalSettings.ThalSettings` `[get]`

`TmThal.p3_thal` settings for duplex calculation

#### 5.34.2.10 `Thermodynamics.p3_tm_method Mufasa.BackEnd.TmThal.TmThalSettings.TmMethod` `[get]`, `[set]`

Melting temperature computation method. See `Thermodynamics.p3_tm_method_type`

If `tm_method==santalucia_auto`, then the table of nearest-neighbor thermodynamic parameters and method for `Tm` calculation in the paper [SantaLucia JR (1998) "A unified view of polymer, dumbbell and oligonucleotide DNA nearest-neighbor thermodynamics", Proc Natl Acad Sci 95:1460-65 <http://dx.doi.org/10.1073/pnas.95.4.1460>] is used. *THIS IS THE RECOMMENDED VALUE.* If `tm_method==breslauer_auto`, then method for `Tm` calculations in the paper [Rychlik W, Spencer WJ and Rhoads RE (1990) "Optimization



of the annealing temperature for DNA amplification in vitro", Nucleic Acids Res 18:6409-12 <http://www.pubmedcentral.nih.gov/articlerender.fcgi?tool=pubmed&pubmedid=2243783>]. and the thermodynamic parameters in the paper [Breslauer KJ, Frank R, Blöcker H and Marky LA (1986) "Predicting DNA duplex stability from the base sequence" Proc Natl Acad Sci 83:4746-50 <http://dx.doi.org/10.1073/pnas.83.11.3746>], are is used. This is the method and the table that primer3 used up to and including version 1.0.1

5.34.2.11 **Thermodynamics.p3\_tm\_args** Mufasa.BackEnd.TmThal.TmThalSettings.TmSettings [get]

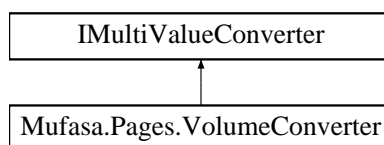
TmThal.p3\_thal settings for duplex calculation

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/BackEnd/TmThal/TmThalSettings.cs

## 5.35 Mufasa.Pages.VolumeConverter Class Reference

Inheritance diagram for Mufasa.Pages.VolumeConverter:



### Public Member Functions

- object [Convert](#) (object[] values, Type targetType, object parameter, CultureInfo culture)  
*Valume conversion.*
- object[] [ConvertBack](#) (object value, Type[] targetTypes, object parameter, System.Globalization.CultureInfo culture)  
*Not implemented.*

### 5.35.1 Detailed Description

Volume converter class. Computes [Reaction](#) volumes from fragment lengths and concentrations.

### 5.35.2 Member Function Documentation

5.35.2.1 object Mufasa.Pages.VolumeConverter.Convert ( object[] values, Type targetType, object parameter, CultureInfo culture )

Valume conversion.

Parameters

<i>values</i>	Values produced by the <a href="#">FragmentViewModel</a> .
<i>targetType</i>	Target type.

<i>parameter</i>	Parameter.
<i>culture</i>	Culture info.

#### Returns

5.35.2.2 `object [] Mufasa.Pages.VolumeConverter.ConvertBack ( object value, Type[] targetTypes, object parameter, System.Globalization.CultureInfo culture )`

Not implemented.

#### Parameters

<i>value</i>	Not implemented.
<i>targetTypes</i>	Not implemented.
<i>parameter</i>	Not implemented.
<i>culture</i>	Not implemented.

#### Returns

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

- C:/Users/Kuba/Documents/GitHub/MUFASA/Mufasa/Mufasa/Pages/VolumeConverter.cs