

Aufgabe 1 - Die Kunst der Fuge

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Chapter 1

Namespace Index

1.1 Namespace List

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

| | |
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|--|---|

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

| | |
|---|----|
| Comparable | |
| Aufgabe1_DieKunstDerFuge.Row | 11 |
| Aufgabe1_DieKunstDerFuge.NextPossibleRowSum | 9 |
| Aufgabe1_DieKunstDerFuge.Program | 10 |
| Aufgabe1_DieKunstDerFuge.Wall | 14 |
| Aufgabe1_DieKunstDerFuge.WallBuilder | 15 |

Chapter 3

Class Index

3.1 Class List

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

| | |
|---|----|
| Aufgabe1_DieKunstDerFuge.NextPossibleRowSum | |
| Represents a NextPossibleRowSum type. | 9 |
| Aufgabe1_DieKunstDerFuge.Program | |
| Execution class of the program. | 10 |
| Aufgabe1_DieKunstDerFuge.Row | |
| Represents a row. | 11 |
| Aufgabe1_DieKunstDerFuge.Wall | |
| Represents a wall. | 14 |
| Aufgabe1_DieKunstDerFuge.WallBuilder | |
| Builds the Wall | 15 |

Chapter 4

Namespace Documentation

4.1 Aufgabe1_DieKunstDerFuge Namespace Reference

Classes

- struct [NextPossibleRowSum](#)
Represents a [NextPossibleRowSum](#) type.
- class [Program](#)
Execution class of the program.
- class [Row](#)
Represents a row.
- class **Utilities**
Helper methods.
- class [Wall](#)
Represents a wall.
- class [WallBuilder](#)
Builds the [Wall](#).

Chapter 5

Class Documentation

5.1 Aufgabe1_DieKunstDerFuge.NextPossibleRowSum Struct Reference

Represents a [NextPossibleRowSum](#) type.

Public Member Functions

- [NextPossibleRowSum](#) (int possibleRowSum, int usedBrickIndex)
Constructor.

Properties

- int [PossibleRowSum](#) [get, set]
The next possible row sum.
- int [UsedBrickIndex](#) [get, set]
The block that needs to be placed next for this [PossibleRowSum](#).

5.1.1 Detailed Description

Represents a [NextPossibleRowSum](#) type.

5.1.2 Constructor & Destructor Documentation

5.1.2.1 NextPossibleRowSum()

```
Aufgabe1_DieKunstDerFuge.NextPossibleRowSum.NextPossibleRowSum (
    int possibleRowSum,
    int usedBrickIndex ) [inline]
```

Constructor.

Parameters

| | |
|-----------------------|---|
| <i>possibleRowSum</i> | RowSum. |
| <i>usedBrickIndex</i> | Index of the brick used to get the PossibleRowSum |

5.1.3 Property Documentation

5.1.3.1 PossibleRowSum

```
int Aufgabe1_DieKunstDerFuge.NextPossibleRowSum.PossibleRowSum [get], [set]
```

The next possible row sum.

5.1.3.2 UsedBrickIndex

```
int Aufgabe1_DieKunstDerFuge.NextPossibleRowSum.UsedBrickIndex [get], [set]
```

The block that needs to be placed next for this [PossibleRowSum](#).

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

- NextPossibleRowSum.cs

5.2 Aufgabe1_DieKunstDerFuge.Program Class Reference

Execution class of the program.

5.2.1 Detailed Description

Execution class of the program.

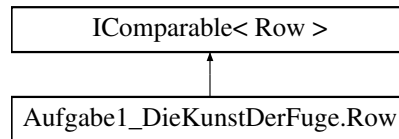
The documentation for this class was generated from the following file:

- Program.cs

5.3 Aufgabe1_DieKunstDerFuge.Row Class Reference

Represents a row.

Inheritance diagram for Aufgabe1_DieKunstDerFuge.Row:



Public Member Functions

- [Row](#) ()
Constructor.
- [Row](#) (int bricksPerRow)
Constructor.
- void [PlaceNextBrick](#) ()
Places the [NextBrickToPlace](#) brick in the row.
- void [RemoveLastBrick](#) ()
Removes the last brick of the row.
- [Row Clone](#) ()
Clones the [Row](#).
- int **CompareTo** ([Row](#) other)
- override string **ToString** ()

Properties

- bool[] [Bricks](#) [get, set]
All the Bricks in the row. Length of brick is determined by index + 1. True if the brick is still available.
- int[] [PlacedBricks](#) [get, set]
The placed bricks in this row (ordered).
- int [PlacedBricksIndex](#) [get]
The current index of [PlacedBricks](#).
- int [RowSum](#) [get, set]
The current length of this row.
- List< [NextPossibleRowSum](#) > [NextPossibleRowSums](#) [get, set]
Contains all the possible RowSums after placing another brick.
- int [NextBrickToPlace](#) [get, set]
The index of the next brick to place to fill the current searched gap.

5.3.1 Detailed Description

Represents a row.

5.3.2 Constructor & Destructor Documentation

5.3.2.1 Row() [1/2]

```
Aufgabe1_DieKunstDerFuge.Row.Row ( ) [inline]
```

Constructor.

5.3.2.2 Row() [2/2]

```
Aufgabe1_DieKunstDerFuge.Row.Row (
    int bricksPerRow ) [inline]
```

Constructor.

Parameters

| | |
|---------------------|---------------------------|
| <i>bricksPerRow</i> | Number of bricks per row. |
|---------------------|---------------------------|

5.3.3 Member Function Documentation

5.3.3.1 Clone()

```
Row Aufgabe1_DieKunstDerFuge.Row.Clone ( ) [inline]
```

Clones the [Row](#).

Returns

The cloned row instance.

5.3.3.2 PlaceNextBrick()

```
void Aufgabe1_DieKunstDerFuge.Row.PlaceNextBrick ( ) [inline]
```

Places the [NextBrickToPlace](#) brick in the row.

5.3.3.3 RemoveLastBrick()

```
void Aufgabel_DieKunstDerFuge.Row.RemoveLastBrick ( ) [inline]
```

Removes the last brick of the row.

5.3.4 Property Documentation

5.3.4.1 Bricks

```
bool [ ] Aufgabel_DieKunstDerFuge.Row.Bricks [get], [set]
```

All the Bricks in the row. Length of brick is determined by index + 1. True if the brick is still available.

5.3.4.2 NextBrickToPlace

```
int Aufgabel_DieKunstDerFuge.Row.NextBrickToPlace [get], [set]
```

The index of the next brick to place to fill the current searched gap.

5.3.4.3 NextPossibleRowSums

```
List<NextPossibleRowSum> Aufgabel_DieKunstDerFuge.Row.NextPossibleRowSums [get], [set]
```

Contains all the possible RowSums after placing another brick.

5.3.4.4 PlacedBricks

```
int [ ] Aufgabel_DieKunstDerFuge.Row.PlacedBricks [get], [set]
```

The placed bricks in this row (ordered).

5.3.4.5 PlacedBricksIndex

```
int Aufgabel_DieKunstDerFuge.Row.PlacedBricksIndex [get]
```

The current index of [PlacedBricks](#).

5.3.4.6 RowSum

```
int Aufgabe1_DieKunstDerFuge.Row.RowSum [get], [set]
```

The current length of this row.

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

- Row.cs

5.4 Aufgabe1_DieKunstDerFuge.Wall Class Reference

Represents a wall.

Public Member Functions

- [Wall](#) (int height, int bricksPerRow)
Creates a new wall.
- [Wall Clone](#) ()
Clones the [Wall](#).

Properties

- [Row](#) [] [Rows](#) [get, set]
The rows of the wall.

5.4.1 Detailed Description

Represents a wall.

5.4.2 Constructor & Destructor Documentation

5.4.2.1 Wall()

```
Aufgabe1_DieKunstDerFuge.Wall.Wall (  
    int height,  
    int bricksPerRow ) [inline]
```

Creates a new wall.

Parameters

| | |
|---------------------|---------------------------------|
| <i>height</i> | The number of rows in the wall. |
| <i>bricksPerRow</i> | The number of bricks per row. |

5.4.3 Member Function Documentation

5.4.3.1 Clone()

```
Wall Aufgabe1_DieKunstDerFuge.Wall.Clone ( ) [inline]
```

Clones the [Wall](#).

Returns

The cloned wall instance.

5.4.4 Property Documentation

5.4.4.1 Rows

```
Row [ ] Aufgabe1_DieKunstDerFuge.Wall.Rows [get], [set]
```

The rows of the wall.

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

- Wall.cs

5.5 Aufgabe1_DieKunstDerFuge.WallBuilder Class Reference

Builds the [Wall](#).

Public Member Functions

- void [BuildWall](#) (int n)
Tries to build a wall.
- [Wall FillNextGap](#) (int nextGap, [Wall](#) curWall, int freeGaps)
Tries to fill a gap inside the wall.
- void [CalculateWallProperties](#) ()
Calculates the properties of the wall.

Properties

- int [WallHeight](#) [get, set]
The maximum count of rows in the [Wall](#).
- int [BricksPerRow](#) [get, set]
The User input N.
- int [WallLength](#) [get, set]
The maximum length of the [Wall](#).
- int [GapCount](#) [get, set]
The number of gaps inside the wall.
- int [UsedGapCount](#) [get, set]
The number of gaps that will be used.
- int [FreeGaps](#) [get, set]
The number of gaps that won't be used.
- Stopwatch [AlgorithmStopwatch](#) [get, set]
Stopwatch for measuring the algorithm execution time.

5.5.1 Detailed Description

Builds the [Wall](#).

5.5.2 Member Function Documentation

5.5.2.1 BuildWall()

```
void Aufgabe1_DieKunstDerFuge.WallBuilder.BuildWall (
    int n ) [inline]
```

Tries to build a wall.

Parameters

| | |
|----------|------------------------------------|
| <i>n</i> | The BricksPerRow . |
|----------|------------------------------------|

5.5.2.2 CalculateWallProperties()

```
void Aufgabe1_DieKunstDerFuge.WallBuilder.CalculateWallProperties ( ) [inline]
```

Calculates the properties of the wall.

5.5.2.3 FillNextGap()

```
Wall Aufgabe1_DieKunstDerFuge.WallBuilder.FillNextGap (
    int nextGap,
    Wall curWall,
    int freeGaps ) [inline]
```

Tries to fill a gap inside the wall.

Parameters

| | |
|-----------------|--|
| <i>nextGap</i> | The Gap position to fill starting at 0. |
| <i>curWall</i> | The Wall to fill the gap in. |
| <i>freeGaps</i> | The amount of gap positions that can still be left free inside the wall. |

Returns

5.5.3 Property Documentation

5.5.3.1 AlgorithmStopwatch

```
Stopwatch Aufgabe1_DieKunstDerFuge.WallBuilder.AlgorithmStopwatch [get], [set]
```

Stopwatch for measuring the algorithm execution time.

5.5.3.2 BricksPerRow

```
int Aufgabe1_DieKunstDerFuge.WallBuilder.BricksPerRow [get], [set]
```

The User input N.

5.5.3.3 FreeGaps

```
int Aufgabe1_DieKunstDerFuge.WallBuilder.FreeGaps [get], [set]
```

The number of gaps that won't be used.

5.5.3.4 GapCount

```
int Aufgabel_DieKunstDerFuge.WallBuilder.GapCount [get], [set]
```

The number of gaps inside the wall.

5.5.3.5 UsedGapCount

```
int Aufgabel_DieKunstDerFuge.WallBuilder.UsedGapCount [get], [set]
```

The number of gaps that will be used.

5.5.3.6 WallHeight

```
int Aufgabel_DieKunstDerFuge.WallBuilder.WallHeight [get], [set]
```

The maximum count of rows in the [Wall](#).

5.5.3.7 WallLength

```
int Aufgabel_DieKunstDerFuge.WallBuilder.WallLength [get], [set]
```

The maximum length of the [Wall](#).

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

- WallBuilder.cs

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