System.Statistics.docs

Documentation for System.Statistics library

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System.Statistics official documentation

What is the System.Statistics?

System.Statistics is .NET C#/VB.NET Library for using statistical functions more comfortable.

System.Statistics is an open-source project originally written by Seokhyeon Cho(shcho, shcho4271). You can use public, private, commercial, and distribute, modify, contribute freely under the GNU LGPL 2.1 License.

How to use:

System.Statistics can use easily by Visual Studio or JetBrains Rider.

Download Directly

Download Latest Version of System.Statistics:

`https://github.com/shcho4271/System.Statistics/releases/tag/1.0`

Download older version here:

`https://github.com/shcho4271/System.Statistics/releases`

Download via NuGet

Package Manager

```
PM>Install-Package Statistics.NET -Version 1.0.0
```

.NET CLI

```
>dotnet add package Statistics.NET --version 1.0.0
```

Package Reference

```
<PackageReference Include="Statistics.NET" Version="1.0.0">
```

Download via curl

```
# Download as .zip
curl -sSL https://github.com/shcho4271/System.Statistics/archive/1.0
.0.zip -o System.Statistics.zip

# Download as .tar.gz
curl -sSL https://github.com/shcho4271/System.Statistics/archive/1.0
.0.tar.gz -o System.Statistics.tar.gz
```

Using Visual Studio + Download directly

1. Open your solution
2. Right-click **Dependencies** in Solution Explorer → Click **Add Reference...**.
3. Click **Browse..** in Browse → Select downloaded **System.Statistics.dll**.
4. Click **Add** → Click **OK**.

Using Visual Studio + NuGet Package Manager

1. Open your solution
2. Right-click **Dependencies** in Solution Explorer → Click **Manage NuGet Packages...**.
3. Search **Statistics.NET** → Select
4. Click **Install**.

Using JetBrains Rider + Download directly

1. Open your solution
2. Right-click **Dependencies** in YOUR_PROJECT → Click **Add Reference**.
3. Click **Add From...** → Selected downloaded **System.Statistics.dll**.
4. Click **Open** → Click **OK**.

Using JetBrains Rider + NuGet Package Manager

1. Open your solution
2. Right-click **Dependencies** in Solution Explorer → Click **Manage NuGet Packages...**.
3. Search **Statistics.NET** → Select
4. Click **+**(Install).

Official Documentation

Documentation for System.Statistics is available as English, 한국어, and 日本語 officially.

Please contribute localization for System.Statistics.docs!
For more information, Read the Contributing manual.

Documentation for offline

System.Statistics.docs provides an offline-available documentation such as .chm, .epub, .html(compressed to .zip or .tar.gz), and .pdf format. You can use downloading them here.

Contribution for System.Statistics

Library repository : https://github.com/shcho4271/System.Statistics

Documentation repository : https://github.com/shcho4271/System.Statistics.docs

THANKS FOR SPENDING YOUR TIME TO CONTRIBUTE!

You can contribute this project to **Report an issue**, **Contribute the code**, and **Localize the documentation**.
If you're first time to contribute to GitHub, we recommend reading GitHub Guides first.

Contribution for report an issue

Go to:

- Issue about Library
- Issue about Documentation

Contribution for the code

1. **Fork** and Clone the repository.
2. Modify the codes.
3. **Commit** the changed results.
4. **Push** the cloned repository.
5. **Send me the Pull request**.

Rules

- Keep encoding of all files as **UTF-8 with BOM**.
- Line breaking must be `CR LF`.
- **Do not** modify these files directly: `.gitignore`, `System.Statistics.sln`, `System.Statistics.csproj`.
- **Do not** rename `Statistics.cs` file.

We recommend:

- Using **IDE** tools like **Visual Studio** or **JetBrains Rider** when editing the codes.
- keeping commit messages format as `(Create|Update|Rename|Delete) ITEMS [& ...]`. (No extension with `ITEMS`)

Contribution for localize the documentation

1. **Fork** and Clone the repository.

2. Make the folder under `./markdown` folder. The folder name can be only the one of Language code
3. Copy the markdown files from `./markdown/en` or other (already translated) language folder.
4. Modify and **Commit** the files as **translated version**.
5. **Push** the cloned repository.
6. **Send me the Pull request**.

Rules

- All result files must be kept the UTF-8 Markdown format.
- When hyperlinking, please change to same language page as possible. If can't, please hyperlink to English webpages.
- **Do not** modify other files except in the `./markdown`.
- **Do not** rename the files.
- **Do not** upload the CAT project file if you use the CAT tools.

We recommend:

- keeping commit messages format as `(Create|Update|Delete) LANGUAGE/ITEMS [& ...]`. (No extension with `ITEMS`)
- If you don't know about Markdown, Visit Here first.

For more information or needs the correction in the result, please send an issue to me.

Report an issue

To report a bug or enhancement in the library, go to here.
To report a correction of documentation, go to here.

Release Note

Version 1.0.0: 2019-08-16

INITIAL RELEASES

What's New:

- **Added statistics functions**:
  Average, Count, Geometric mean, Harmonic mean, Large, Max, Median, Min, Population standard deviation,
  Population variance, Rank, Small, Sample standard deviation, Sum, Sample variance

Credits

System.Statistics is an open-source project than can be supported by everyone.

API Reference documentation

Orderby Enum

Specifies constant that define the sorting order at Rank Method.

```
public enum Orderby
```

Inheritance:
Object → ValueType → Enum → Orderby

Values

- `Orderby.Ascending`
  Sort by ascending
- `Orderby.Descending`
  Sort by descending

Statistics Class

Namespace: System

Provides static methods for statistical functions.

```
public static class Statistics
```

Inheritance: Object → Statistics

Example

```
using System;
using System.Collections.Generic;

namespace StatisticsCalculator
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Type the data here :");
            string[] input = Console.ReadLine().Split(',');
            List<double> list = new List<double>();
            foreach (string i in input) list.Add(Convert.ToDouble(i.Trim()));
            double[] a = list.ToArray();
            Console.WriteLine("======== CALCULATION RESULT =========");
            Console.WriteLine($"Average             :{Statistics.Average(a)}"
                );
            Console.WriteLine($"Count               :{Statistics.Count(a)}");
            Console.WriteLine($"Geometric mean      :{Statistics.GeometricMea
                n(a)}");
            Console.WriteLine($"Harmonic mean       :{Statistics.HarmonicMean
                (a)}");
            Console.WriteLine($"Maximum             :{Statistics.Max(a)}");
            Console.WriteLine($"Median              :{Statistics.Median(a)}")
                ;
            Console.WriteLine($"Minimum             :{Statistics.Min(a)}");
            Console.WriteLine($"Population stdev    :{Statistics.PStdev(a)}")
                ;
            Console.WriteLine($"Population variance :{Statistics.PVariance(a)
                }");
            Console.WriteLine($"Sample stdev        :{Statistics.Stdev(a)}");
            Console.WriteLine($"Sum                 :{Statistics.Sum(a)}");
            Console.WriteLine($"Sample variance     :{Statistics.Variance(a)}
                ");
        }
    }
}
/*
```

```
The example displays output to the following:
Type the data here : 5, 38, 19, 2, 54, 10  <- Input
======== CALCULATION RESULT =========
Average             :21.3333333333333
Count               :6
Geometric mean      :12.545514967211
Harmonic mean       :6.68549087749783
Maximum             :54
Median              :14.5
Minimum             :2
Population stdev    :18.7942071453473
Population variance :353.222222222222
Sample stdev        :20.5880224078629
Sum                 :128
Sample variance     :423.866666666667
*/
```

Methods

- Average
  Returns the average of parameters.
- Count
  Returns the quantity of parameters.
- GeometricMean
  Returns the geometric mean of parameters.
- HarmonicMean
  Returns the harmonic mean of parameters.
- Large
  Returns the k-th largest value from data array.
- Max
  Returns the maximum value of parameters.
- Median
  Returns the median value of parameters.
- Min
  Returns the minimum value of parameters.
- PStdev
  Returns the population standard deviation of parameters.
- PVariance
  Returns the population variance of parameters.

- Rank
  Returns the ranking of value from data array.
- Small
  Returns the k-th smallest value from data array.
- Stdev
  Returns the sample standard deviation of parameters.
- Sum
  Returns the sum of parameters.
- Variance
  Returns the sample variance of parameters.

See also

- Orderby enum

Statistics.Average Method

Returns the **average** of parameters.

```
public static double Average(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The average of *a*. If a is blanked array, it returns `NaN`.

Statistics.Count Method

Returns the **quantity** of the parameters.

```
public static int count(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Int32`
The quantity of *a*.

Statistics.GeometricMean Method

Returns the **geometric mean** of parameters.

```
public static void GeometricMean(params double[] a);
```

Parameters

- *a* `Double[]`
  The real numbers array.

Returns

`Double`
The geometric mean of *a*

Statistics.HarmonicMean Method

Returns the **harmonic mean** of the parameters.

```
public static double HarmonicMean(params double[] a);
```

Parameters

- *a* `Double[]`
  The real numbers array.

Returns

`Double`
The harmonic mean of *a*.

Statistics.Large Method

Returns the **k-th largest value** from data array.

```
public static double Large(int k, params double[] a);
```

Parameters

- *k* `Int32`
  The position from the largest in the *a*.

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The *k*-th largest value from the *a*.

Statistics.Max Method

Returns the **maximum value** of parameters.

```
public static double Max(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The maximum value from the *a*.

Statistics.Median Method

Returns the **median value** of parameters.

```
public static double Median(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The median value from the *a*.

Statistics.Min Method

Returns the **minimum value** of parameters.

```
public static double Min(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The minimum value of *a*.

Statistics.PStdev Method

Returns the **population standard deviation** of parameters.

```
public static double PStdev(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The population standard deviation of *a*.

Statistics.PVariance Method

Returns the **population variance** of parameters.

```
public static double PVariance(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The population variance of *a*

Statistics.Rank Method

Returns the **ranking of value** from data array.

```
public static int Rank(double value, params double[] a);
public static int Rank(double value, Orderby orderby, params double[] a);
```

Parameters

- *value* `Double`
  A value for which you want to find the rank

- *orderby* `Orderby`
  The sorting order of a

- *a* `Double[]`
  A real numbers array.

Returns

`Int32`
The rank of value about *a*.

Statistics.Small Method

Returns the **k-th smallest value** from data array.

```
public static double Small(params double[] a);
```

Parameters

- *k* `Int32`
  The position from the smallest in the a.
- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The *k*-th smallest value from the *a*.

Statistics.Stdev Method

Returns the **sample standard deviation** of parameters.

```
public static double Stdev(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The sample standard deviation of *a*.

Statistics.Sum Method

Returns the **sum** of parameters

```
public static double Sum(params double[] a);
```

Parameters

- *a* `Double[]`
  A real number array.

Returns

`Double`
The sum of *a*.

Statistics.Variance Method

Returns the **sample variance** of parameters.

```
public static double Variance(params double[] a);
```

Parameters

- *a* `Double[]`
  A real numbers array.

Returns

`Double`
The sample variance of *a*.

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Version 2.1, February 1999

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