

# LinksPlatform's Platform.Ranges Class Library

./EnsureExtensions.cs

```

1  using System;
2  using System.Collections.Generic;
3  using System.Diagnostics;
4  using System.Runtime.CompilerServices;
5  using Platform.Exceptions;
6  using Platform.Exceptions.ExtensionRoots;
7
8  #pragma warning disable IDE0060 // Remove unused parameter
9
10 namespace Platform.Ranges
11 {
12     public static class EnsureExtensions
13     {
14         private const string DefaultMaximumShouldBeGreaterOrEqualToMinimumMessage = "Maximum
            ↳ should be greater or equal to minimum.";
15
16         #region Always
17
18         [MethodImpl(MethodImplOptions.AggressiveInlining)]
19         public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
            ↳ EnsureAlwaysExtensionRoot root, T minimum, T maximum) =>
            ↳ MaximumArgumentIsGreaterOrEqualToMinimum(root, minimum, maximum, nameof(maximum));
20
21         [MethodImpl(MethodImplOptions.AggressiveInlining)]
22         public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
            ↳ EnsureAlwaysExtensionRoot root, T minimum, T maximum, string argumentName) =>
            ↳ MaximumArgumentIsGreaterOrEqualToMinimum(root, minimum, maximum, nameof(maximum),
            ↳ DefaultMaximumShouldBeGreaterOrEqualToMinimumMessage);
23
24         [MethodImpl(MethodImplOptions.AggressiveInlining)]
25         public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
            ↳ EnsureAlwaysExtensionRoot root, T minimum, T maximum, string argumentName, string
            ↳ message)
26         {
27             string messageBuilder() => message;
28             MaximumArgumentIsGreaterOrEqualToMinimum(root, minimum, maximum, argumentName,
            ↳ messageBuilder());
29         }
30
31         [MethodImpl(MethodImplOptions.AggressiveInlining)]
32         public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
            ↳ EnsureAlwaysExtensionRoot root, T minimum, T maximum, string argumentName,
            ↳ Func<string> messageBuilder)
33         {
34             if (Comparer<T>.Default.Compare(maximum, minimum) < 0)
35             {
36                 throw new ArgumentException(messageBuilder(), argumentName);
37             }
38         }
39
40         [MethodImpl(MethodImplOptions.AggressiveInlining)]
41         public static void ArgumentInRange<T>(this EnsureAlwaysExtensionRoot root, T
            ↳ argumentValue, T minimum, T maximum) => ArgumentInRange(root, argumentValue, new
            ↳ Range<T>(minimum, maximum), null);
42
43         [MethodImpl(MethodImplOptions.AggressiveInlining)]
44         public static void ArgumentInRange<T>(this EnsureAlwaysExtensionRoot root, T
            ↳ argumentValue, T minimum, T maximum, string argumentName) => ArgumentInRange(root,
            ↳ argumentValue, new Range<T>(minimum, maximum), argumentName);
45
46         [MethodImpl(MethodImplOptions.AggressiveInlining)]
47         public static void ArgumentInRange<T>(this EnsureAlwaysExtensionRoot root, T
            ↳ argumentValue, Range<T> range) => ArgumentInRange(root, argumentValue, range, null);
48
49         [MethodImpl(MethodImplOptions.AggressiveInlining)]
50         public static void ArgumentInRange<T>(this EnsureAlwaysExtensionRoot root, T
            ↳ argumentValue, Range<T> range, string argumentName)
51         {
52             string messageBuilder() => $"Argument value [{argumentValue}] is out of range
            ↳ {range}.";
53             ArgumentInRange(root, argumentValue, range, argumentName, messageBuilder());
54         }
55
56         [MethodImpl(MethodImplOptions.AggressiveInlining)]
57         public static void ArgumentInRange<T>(this EnsureAlwaysExtensionRoot root, T
            ↳ argumentValue, Range<T> range, string argumentName, string message)

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58     {
59         string messageBuilder() => message;
60         ArgumentInRange(root, argumentValue, range, argumentName, messageBuilder);
61     }
62
63     [MethodImpl(MethodImplOptions.AggressiveInlining)]
64     public static void ArgumentInRange<T>(this EnsureAlwaysExtensionRoot root, T
65     ↪ argumentValue, Range<T> range, string argumentName, Func<string> messageBuilder)
66     {
67         if (!range.ContainsValue(argumentValue))
68         {
69             throw new ArgumentOutOfRangeException(argumentName, argumentValue,
70             ↪ messageBuilder());
71         }
72     }
73
74     #endregion
75
76     #region OnDebug
77
78     [Conditional("DEBUG")]
79     public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
80     ↪ EnsureOnDebugExtensionRoot root, T minimum, T maximum) =>
81     ↪ Ensure.Always.MaximumArgumentIsGreaterOrEqualToMinimum(minimum, maximum, null);
82
83     [Conditional("DEBUG")]
84     public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
85     ↪ EnsureOnDebugExtensionRoot root, T minimum, T maximum, string argumentName) =>
86     ↪ Ensure.Always.MaximumArgumentIsGreaterOrEqualToMinimum(minimum, maximum,
87     ↪ argumentName);
88
89     [Conditional("DEBUG")]
90     public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
91     ↪ EnsureOnDebugExtensionRoot root, T minimum, T maximum, string argumentName, string
92     ↪ message) => Ensure.Always.MaximumArgumentIsGreaterOrEqualToMinimum(minimum, maximum,
93     ↪ argumentName, message);
94
95     [Conditional("DEBUG")]
96     public static void MaximumArgumentIsGreaterOrEqualToMinimum<T>(this
97     ↪ EnsureOnDebugExtensionRoot root, T minimum, T maximum, string argumentName,
98     ↪ Func<string> messageBuilder) =>
99     ↪ Ensure.Always.MaximumArgumentIsGreaterOrEqualToMinimum(minimum, maximum,
100     ↪ argumentName, messageBuilder);
101
102     [Conditional("DEBUG")]
103     public static void ArgumentInRange<T>(this EnsureOnDebugExtensionRoot root, T
104     ↪ argumentValue, T minimum, T maximum) => Ensure.Always.ArgumentInRange(argumentValue,
105     ↪ new Range<T>(minimum, maximum), null);
106
107     [Conditional("DEBUG")]
108     public static void ArgumentInRange<T>(this EnsureOnDebugExtensionRoot root, T
109     ↪ argumentValue, T minimum, T maximum, string argumentName) =>
110     ↪ Ensure.Always.ArgumentInRange(argumentValue, new Range<T>(minimum, maximum),
111     ↪ argumentName);
112
113     [Conditional("DEBUG")]
114     public static void ArgumentInRange<T>(this EnsureOnDebugExtensionRoot root, T argument,
115     ↪ Range<T> range) => Ensure.Always.ArgumentInRange(argument, range, null);
116
117     [Conditional("DEBUG")]
118     public static void ArgumentInRange<T>(this EnsureOnDebugExtensionRoot root, T argument,
119     ↪ Range<T> range, string argumentName) => Ensure.Always.ArgumentInRange(argument,
120     ↪ range, argumentName);
121
122     [Conditional("DEBUG")]
123     public static void ArgumentInRange<T>(this EnsureOnDebugExtensionRoot root, T argument,
124     ↪ Range<T> range, string argumentName, string message) =>
125     ↪ Ensure.Always.ArgumentInRange(argument, range, argumentName, message);
126
127     [Conditional("DEBUG")]
128     public static void ArgumentInRange<T>(this EnsureOnDebugExtensionRoot root, T argument,
129     ↪ Range<T> range, string argumentName, Func<string> messageBuilder) =>
130     ↪ Ensure.Always.ArgumentInRange(argument, range, argumentName, messageBuilder);
131
132     #endregion
133 }
134 }

```

./Range.cs

```
1 using System;
2 using System.Collections.Generic;
3 using Platform.Exceptions;
4
5 namespace Platform.Ranges
6 {
7     /// <summary>
8     /// Represents a range between mininum and maximum values.
9     /// Представляет диапазон между минимальным и максимальным значениями.
10    /// </summary>
11    /// <remarks>
12    /// Based on http://stackoverflow.com/questions/5343006/is-there-a-c-sharp-type-for-represen
13    /// ↪ ting-an-integer-range
14    /// </remarks>
15    public struct Range<T> : IEquatable<Range<T>>
16    {
17        private static readonly Comparer<T> _comparer = Comparer<T>.Default;
18        private static readonly EqualityComparer<T> _equalityComparer =
19            ↪ EqualityComparer<T>.Default;
20
21        /// <summary>
22        /// Returns minimum value of the range.
23        /// Возвращает минимальное значение диапазона.
24        /// </summary>
25        public readonly T Minimum;
26
27        /// <summary>
28        /// Returns maximum value of the range.
29        /// Возвращает максимальное значение диапазона.
30        /// </summary>
31        public readonly T Maximum;
32
33        /// <summary>
34        /// Initializes a new instance of the Range class.
35        /// Инициализирует новый экземпляр класса Range.
36        /// </summary>
37        /// <param name="minimumAndMaximum">Single value for both Minimum and Maximum fields.
38        /// ↪ Одно значение для полей Minimum и Maximum.</param>
39        public Range(T minimumAndMaximum)
40        {
41            Minimum = minimumAndMaximum;
42            Maximum = minimumAndMaximum;
43        }
44
45        /// <summary>
46        /// Initializes a new instance of the Range class.
47        /// Инициализирует новый экземпляр класса Range.
48        /// </summary>
49        /// <param name="minimum">The minimum value of the range. Минимальное значение
50        /// ↪ диапазона.</param>
51        /// <param name="maximum">The maximum value of the range. Максимальное значение
52        /// ↪ диапазона.</param>
53        /// <exception cref="ArgumentException">Thrown when maximum is less than
54        /// ↪ minimum.</exception>
55        public Range(T minimum, T maximum)
56        {
57            Ensure.Always.MaximumArgumentIsGreaterOrEqualToMinimum(minimum, maximum,
58                ↪ nameof(maximum));
59            Minimum = minimum;
60            Maximum = maximum;
61        }
62
63        /// <summary>
64        /// Presents the Range in readable format.
65        /// Представляет диапазон в удобном для чтения формате.
66        /// </summary>
67        /// <returns>String representation of the Range. Строковое представление
68        /// ↪ диапазона.</returns>
69        public override string ToString() => $"{Minimum}, {Maximum}";
70
71        /// <summary>
72        /// Determines if the provided value is inside the range.
73        /// Определяет, находится ли указанное значение внутри диапазона.
74        /// </summary>
75        /// <param name="value">The value to test. Значение для проверки.</param>
76        /// <returns>True if the value is inside Range, else false. True, если значение
77        /// ↪ находится внутри диапазона, иначе false.</returns>
```

```

69     public bool ContainsValue(T value) => _comparer.Compare(Minimum, value) <= 0 &&
    ↪     _comparer.Compare(Maximum, value) >= 0;
70
71     /// <summary>
72     /// Determines if this Range is inside the bounds of another range.
73     /// Определяет, находится ли этот диапазон в пределах другого диапазона.
74     /// </summary>
75     /// <param name="range">The parent range to test on. Родительский диапазон для
    ↪     проверки.</param>
76     /// <returns>True if range is inclusive, else false. True, если диапазон включен, иначе
    ↪     false.</returns>
77     public bool IsInsideRange(Range<T> range) => range.ContainsRange(this);
78
79     /// <summary>
80     /// Determines if another range is inside the bounds of this range.
81     /// Определяет, находится ли другой диапазон внутри границ этого диапазона.
82     /// </summary>
83     /// <param name="range">The child range to test. Дочерний диапазон для проверки.</param>
84     /// <returns>True if range is inside, else false. True, если диапазон находится внутри,
    ↪     иначе false.</returns>
85     public bool ContainsRange(Range<T> range) => ContainsValue(range.Minimum) &&
    ↪     ContainsValue(range.Maximum);
86
87     /// <summary>
88     /// Indicates whether the current range is equal to another range.
89     /// Определяет, равен ли текущий диапазон другому диапазону.
90     /// </summary>
91     /// <param name="other">A range to compare with this range. Диапазон для сравнения с
    ↪     этим диапазоном.</param>
92     /// <returns>True if the current range is equal to the other range; otherwise, false.
    ↪     True, если текущий диапазон равен другому диапазону; иначе false.</returns>
93     public bool Equals(Range<T> other) => _equalityComparer.Equals(Minimum, other.Minimum)
    ↪     && _equalityComparer.Equals(Maximum, other.Maximum);
94 }
95 }

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