

# Int Range

```
//http://isotopescreencapture.codeplex.com/  
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using System.Collections.Generic;  
  
namespace Isotope.Collections.Ranges  
{  
    public struct IntRange  
    {  
        public readonly int _Lower;  
        public readonly int _Length;  
  
        public int Lower  
        {  
            get { return this._Lower; }  
        }  
  
        public int Upper  
        {  
            get { return this.Lower + this.Length - 1; }  
        }  
  
        public int Length  
        {  
            get { return this._Length; }  
        }  
  
        private IntRange(int lower, int length)  
        {  
            this._Lower = lower;  
            this._Length = length;  
  
            if (this.Lower > this.Upper)  
            {  
                throw new System.OverflowException();  
            }  
        }  
    }  
}
```

```

}

///

/// Creates a range from the lower and upper values
///
///
/// (0,0) -> [0]
/// (0,1) -> [0,1]
/// (0,5) -> [0,1,2,3,4,5]
/// (2,5) -> [2,3,4,5]
///
/// /// ///
public static IntRange FromEndpoints(int lower, int upper)
{
    return new IntRange(lower, upper - lower + 1);
}

///

/// Creates a range of a single number
///
///
/// ///
public static IntRange FromInteger(int value)
{
    return new IntRange(value, 1);
}

///

/// Creates a new range from a starting value and including
all the numbers following that
///
///
/// (2,0) -> []
/// (2,1) -> [2]
/// (2,2) -> [2,3]
/// (2,3) -> [2,3,4]

```

```

/// (2,4) -> [2,3,4,5]
///
/// ///
public static IntRange FromLower(int lower, int length)
{
    if (length < 0) { throw new
        System.ArgumentOutOfRangeException("length", "must be >= 0");
    }

    return new IntRange(lower, length);
}

public override string ToString()
{
    var invariant_culture =
        System.Globalization.CultureInfo.InvariantCulture;
    return string.Format(invariant_culture, "Range({0},{1})",
        this.Lower, this.Upper);
}

private static bool _intersects(IntRange range1, IntRange
range2)
{
    return ((range1.Lower <= range2.Lower) && (range1.Upper >=
range2.Lower));
}

///

/// Tests if this range interests with another
///
/// the other range /// true if they intersect
public bool Intersects(IntRange range)
{
    return (_intersects(this, range) || _intersects(range, this));
}

private static int Delta = 1;

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private static bool _touches(IntRange range1, IntRange range2)
{
var val = (range1.Upper + Delta) == range2.Lower;
return val;
}

///

/// Tests if this range touches another. For example (1-2)
touches (3,5) but (1,2) does not touch (4,5)
///
/// the other range /// true if they touch
public bool Touches(IntRange range)
{
var val = _touches(this, range) || _touches(range, this);
return val;
}

///

/// Tests if this range contains a specific integer
///
/// the integer /// true if the number is contained
public bool Contains(int n)
{
return ((this.Lower <= n) && (n <= this.Upper)); } ///
/// Join this range with another and return a single range
that contains them both. The ranges must either touch or
interest.
/// for example (0,2) and (3,7) will yield (0,7)
///

/// the other range /// the merged range
public IntRange JoinWith(IntRange range)
{
if (this.Intersects(range) || this.Touches(range))
{
int new_Upper = System.Math.Max(this.Upper, range.Upper);
int new_Lower = System.Math.Min(this.Lower, range.Lower);

```

```
return IntRange.FromEndpoints(new_Lower, new_Upper);
}
else
{
throw new System.ArgumentException();
}
}

///

/// Get each int in the range from the lower value to the
upper value
///
/// each int in the range
public IEnumerable Values
{
get
{
for (int i = this.Lower; i <= this.Upper; i++) { yield return
i; } } } } } [/csharp]
```