Contents

1   Bounded Numbers

(BNumbers)

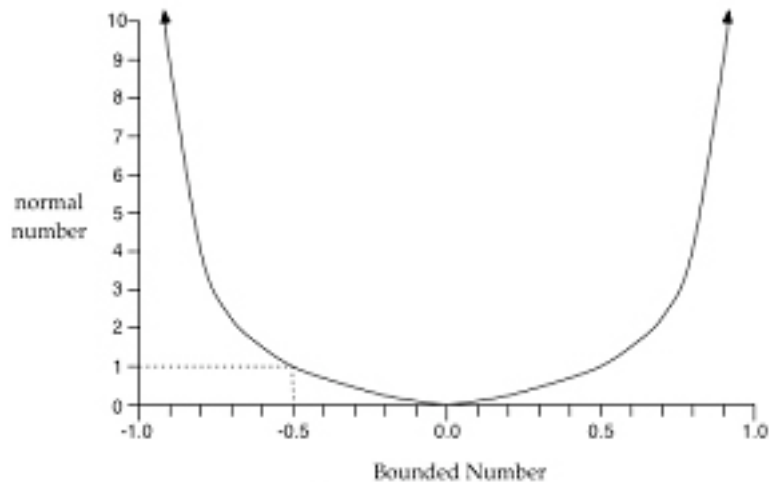BNumbers are a class of numbers invented for Storytronic representation of Attributes and other values, and are constrained within the theoretical range -1 (-∞) to +1 (+∞).
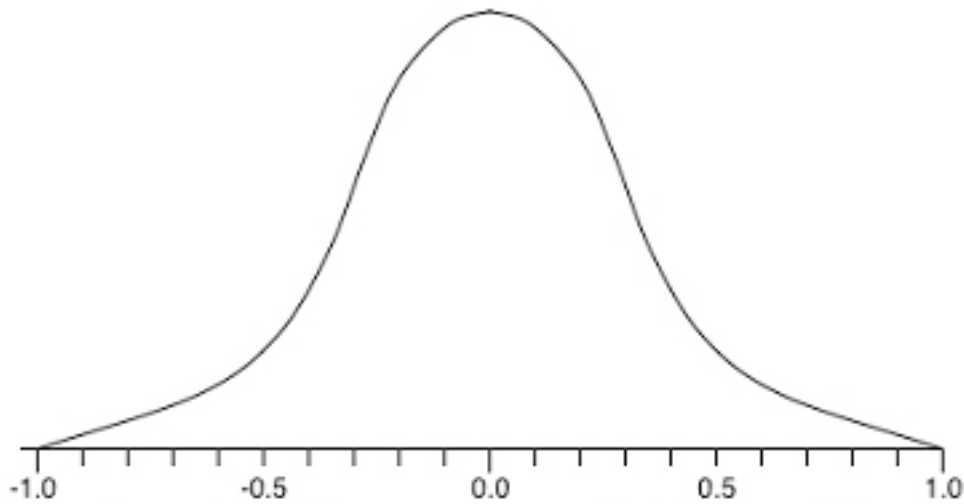
Maximum permitted BNumber value (Maxi) =   +0.9999.

Minimum permitted BNumber value (Mini) =   -0.9999.

The graph of the BNumber to Number transform looks like this:

$$y = 1 - \frac{1}{1 + x} \qquad\qquad y = \frac{1}{1 - x} - 1$$

2 Convert a Standard Number to a Bounded Number

(Number2BNumber)

2.1 *Number2BNumber(N1) for Numbers greater than or equal to zero:*

If (Number > 9999) THEN Number = 9999

(this limits the range and resolution of Numbers)

BNumber = 1 - (1 / (1 + Number))

2.2 *Number2BNumber(N1) for Numbers less than zero:*

If (Number < -9999) THEN Number = -9999

(this limits the range and resolution of Numbers)

BNumber = (1 / (1-Number)) - 1

3 Convert a Bounded Number to a Standard Number

(BNumber2Number)

3.1 *BNumber2Number (BN1) for BNumbers greater than or equal to zero:*

If (BNumber > 0.9999) THEN BNumber = 0.9999

(this limits the range and resolution of BNumbers)

Number = (1 / (1-BNumber)) - 1

3.2 *BNumber2Number (BN1) for BNumbers less than zero:*

If (BNumber < -0.9999) THEN BNumber = -0.9999

(this limits the range and resolution of BNumbers)

Number = 1 - (1 / (1 + BNumber))

4   Addition and Subtraction of Bounded Numbers

(BSum, BDifference)

4.1   BSum(BN1, BN2) for all BNumbers:

BSum = Number2BNumber(BNumber2Number(BN1) +
        BNumber2Number(BN2))

4.2   BDifference(BN1, BN2) for all BNumbers:

BDifference = Number2BNumber(BNumber2Number(BN1) -
        BNumber2Number(BN2))

5   Unipolar Numbers

(UNumbers)

UNumbers are a class of numbers invented for Storytronic representation of certain
Attributes and other values. UNumbers are BNumbers that are squeezed into the
positive end of the scale, and are constrained within the theoretical range 0 to $+1$ ($+\infty$).
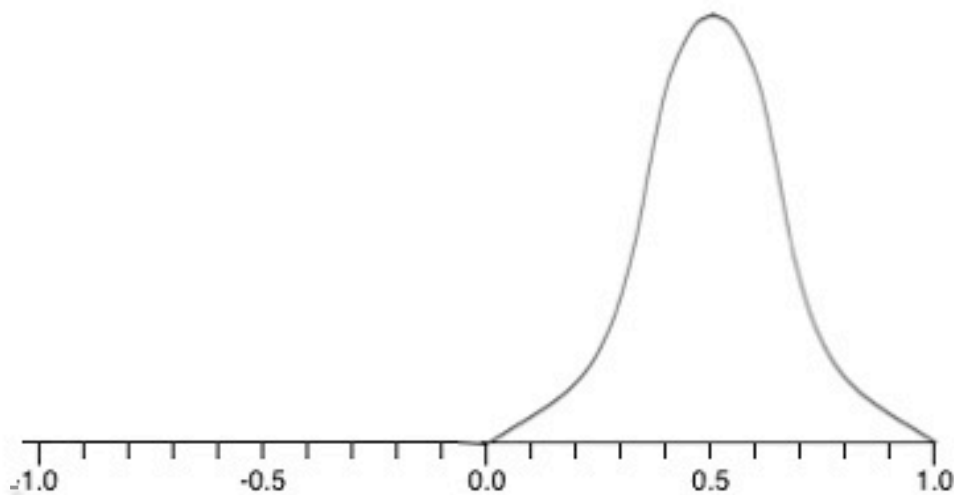
Maximum permitted BNumber value (Maxi) =   +0.9999.

Minimum permitted BNumber value   =   0.0.

The graph of the BNumber to UNumber transform looks like this:
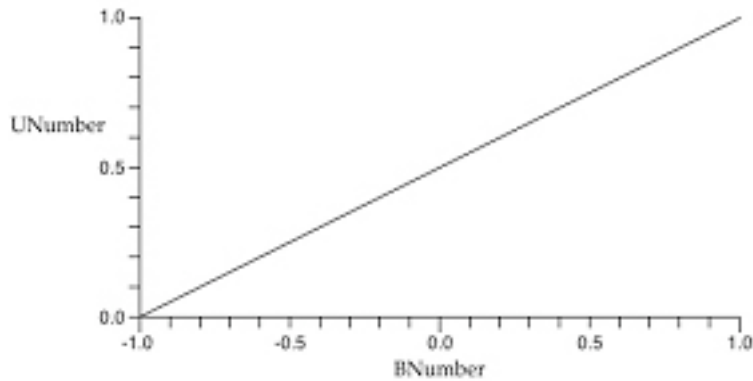
BDifference and BSum, and all other BNumber Operators, may be used with UNumbers.

6 Convert a Bounded Number to a Unipolar Number and Vice Versa

(BNumber2UNumber, UNumber2BNumber)

### 6.1 BNumber2UNumber (BN1) for all UNumbers:

UNumber = 1 - ((1-BNumber) / 2)

6.2 UNumber2BNumber (UN1) for all BNumbers:

BNumber = 1 - 2 * (1-UNumber)

7   Quantifiers

(Quantifiers)

Quantifiers are a class of numbers that allows numerical script results to be displayed to the player. In Deikto (what the player sees), they exist as words (e.g., tiny, medium small, very large). In Sappho (the scripting language), the words represent specific values on the BNumber scale:
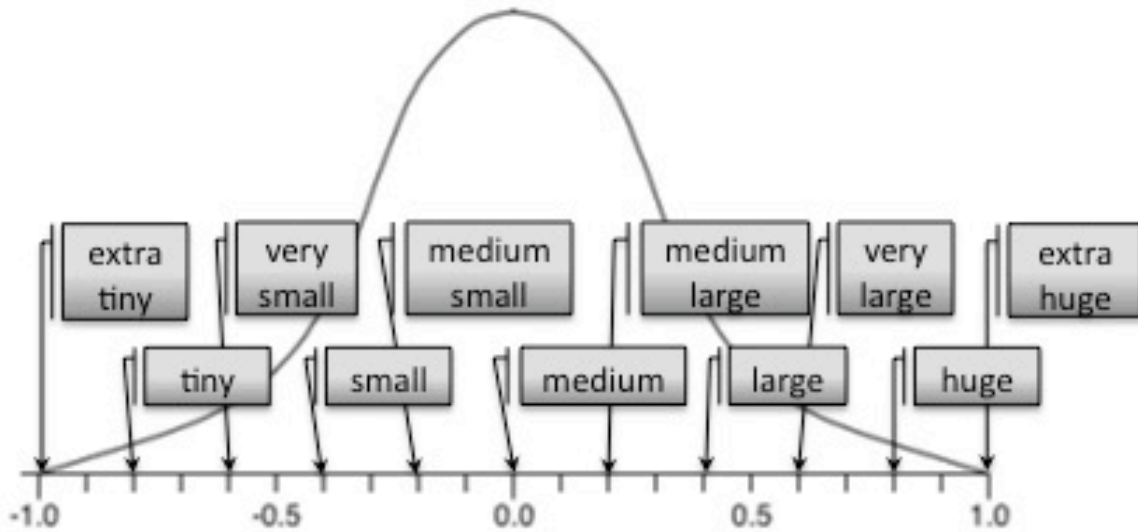
(They can also be used on a UNumber scale, which squeezes the Quantifiers into the positive side of the scale. To do this, see instructions below.)

Quantifiers are calculated using an index number, 0-10:

Quantifier	Quantifier Index	Corresponding BNumber
extra tiny	0	-0.99
tiny	1	-0.8
very small	2	-0.6
small	3	-0.4
medium small	4	-0.2
medium	5	0.0
medium large	6	+0.2
large	7	+0.4
very large	8	+0.6
huge	9	+0.8
extra huge	10	+0.99

8   Convert Bounded and Unipolar Numbers to a Quantifier and Vice Versa

(BNumber2Quantifier, Quantifier2BNumber)

8.1   BNumber2Quantifier (BN1) for all BNumbers:

x = (BNumber * 5) + 5

Quantifier Index = integer(x)

(This rounds off the floating-point value of x to an integer)

8.2   Quantifier2BNumber (Q1) for all Quantifiers:

BNumber = (Quantifier Index - 5) / 5

8.3   UNumber2Quantifier (UN1) for all UNumbers:

To calculate UNumber2Quantifier, use the following:

Quantifier (UN) =BNumber2Quantifier (UNumber2BNumber (UN1))

8.4   Quantifier2UNumber (Q1) for all Quantifiers:

To calculate Quantifier2UNumber, use the following:

UNumber (Q1) =BNumber2UNumber (Quantifier2BNumber (Q1))