

12.1.20 Editors - Geometry Nodes Editor - Header - Add Menu - Utilities

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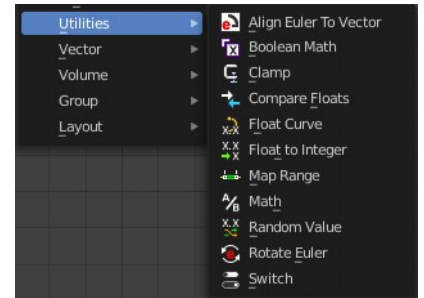
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Add menu - Utilities

Utility nodes are mainly for mathematical operations.



Align Euler to Vector

Aligns a euler value to a vector.

Inputs

Rotation

The input euler rotation vector.

Factor

The factor to align the euler value to the vector.

Vector

The vector to align to.

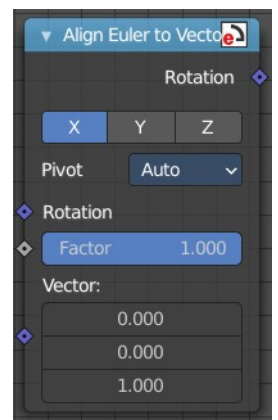
Properties

Align Axis

To which axis to align the vector.

Pivot

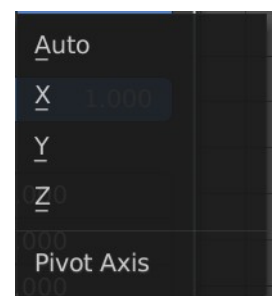
The pivot axis.



Output

Rotation

The output rotation euler angle.



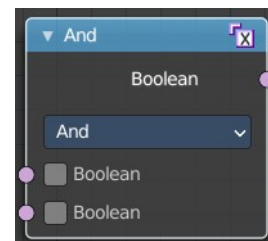
Boolean Math

The Boolean Math node performs a basic logical operation between its inputs.

Inputs

Boolean

Two standard Boolean inputs.



Properties

Operation

And

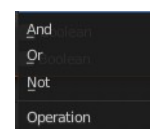
True if both inputs are true.

Or

True if either or both inputs are true.

Not

True if both inputs are false.



Output

Boolean

Standard Boolean output.

Clamp

Clamps a value between a minimum and a maximum.

Inputs

Value

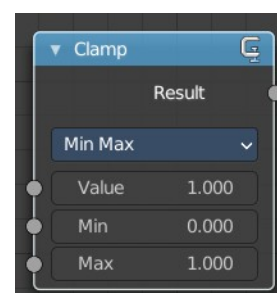
The input value to be clamped.

Min

The minimum value.

Max

The maximum value.



Properties

Clamp Type

Min Max

Clamp values using Min and Max values.



Range

Clamp values between Min and Max range.

Outputs

Result

The input value after clamping.

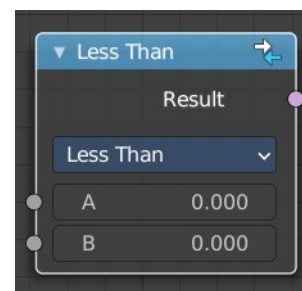
Compare Floats

The Float Compare node takes two inputs and does a math comparison between them.

Inputs

A, B

Standard float value input.



Properties

Operation

A is less than B

True if A is smaller than B.

A is lesser than or equal B

True if A is smaller or equal than B.

A is greater than B

True if A is bigger than B.

A is greater than or equal B

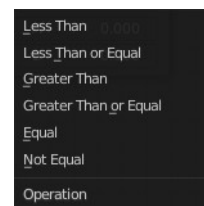
True if A is bigger or equal than B.

A is equal B

True if A and B are the same.

A is not equal B

True if A and B are different.



Output

Result

Standard Boolean output.

Float Curve

The Float Curve node maps an input float to a curve and outputs a float value. This curve can then be used for profiles for example.

Inputs

Factor

How strong the input influences the output value.

Attribute

The input value.



Properties

Curve Widget

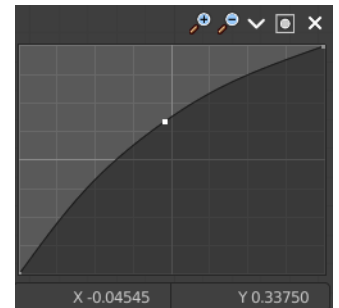
Navigation elements

The navigation elements at the top are described from left to right.



Zoom in and out

The two buttons with the magnifying glass at it zooms in and out in the curve window.



Tools

Tools is a menu where you can find some curve related tools.

Reset View

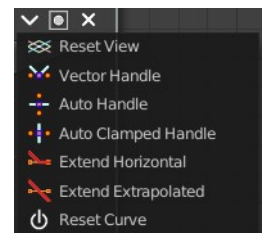
Resets the curve windows zoom.

Vector Handle

Set handle type to Vector.

Auto Handle

Set handle type to Auto.



Auto Clamped Handle

Set handle type to Auto Clamped.

Extend Horizontal

Extends the curve before the last point and after the last point horizontally.

Extend Extrapolation

Extends the curve before the last point and after the last point extrapolated.

Reset Curve

Resets the curve to the initial shape.

Float to Integer

Converts a floating point value into an integer value.

Inputs

Float

The input float value.

Properties

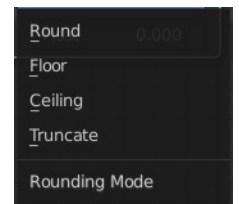
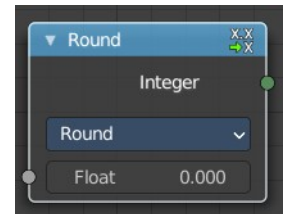
Rounding Mode

How the float value should be converted.

Outputs

Integer

The output integer value



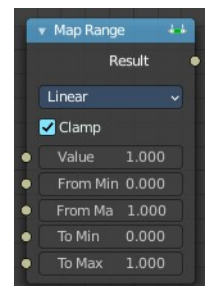
Map Range

This node converts (maps) an input value range into a destination range. By default, values outside the specified input range will be proportionally mapped as well. This node is similar to Map Value node but provides a more intuitive way to specify the desired output range.

Inputs

Value

Standard value input.



From Min

Start of the input value range.

From Max

End of the input value range.

To Min

Start of the destination range.

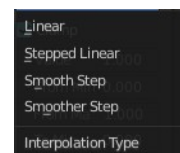
To Max

End of the destination range.

Properties

Interpolation Type

how to interpolate the values between min and max.



Clamp

Clamps values to Min/Max of the destination range.

Outputs

Value

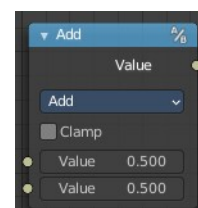
Standard value output.

Math

The Math Node performs math operations.

Inputs

The inputs of the node are dynamic. Some inputs are only available with certain operations. For example, the Addend input is only available in the Multiply Add operator.



Value

Input Value. Trigonometric functions read this value as radians.

Addend

Input Addend.

Base

Input Base.

Exponent

Input Exponent.

Epsilon

Input Epsilon.

Distance

Input Distance.

Min

Input Minimum.

Max

Input Maximum.

Increment

Input Increment.

Scale

Input Scale.

Degrees

Input Degrees.

Radians

Input Radians.

Properties

Operation

The mathematical operator to be applied to the input values:

Functions	Comparison	Rounding	Trigonometric	Conversion
Add	Minimum	Round	Sine	To Radians
Subtract	Maximum	Floor	Cosine	To Degrees
Multiply	Less Than	Ceil	Tangent	
Divide	Greater Than	Truncate	Arcsine	
Multiply Add	Sign	Fraction	Arccosine	
Power	Compare	Modulo	Arctangent	
Logarithm	Smooth Minimum	Wrap	Arctan2	
Square Root	Smooth Maximum	Snap	Hyperbolic Sine	
Inverse Square Root		Ping-pong	Hyperbolic Cosine	
Absolute			Hyperbolic Tangent	
Exponent				

Functions

Add

The sum of the two values.

Subtract

The difference between the two values.

Multiply

The product of the two values.

Divide

The division of the first value by the second value.

Multiply Add

The sum of the product of the two values with Addend.

Power

The Base raised to the power of Exponent.

Logarithm

The log of the value with a Base as its base.

Square Root

The square root of the value.

Inverse Square Root

One divided by the square root of the value.

Absolute

The input value is read with without regard to its sign. This turns negative values into positive values.

Exponent

Raises Euler's number to the power of the value.

Comparison

Minimum

Outputs the smallest of the input values.

Maximum

Outputs the largest of two input values.

Less Than

Outputs 1.0 if the first value is smaller than the second value. Otherwise the output is 0.0.

Greater Than

Outputs 1.0 if the first value is larger than the second value. Otherwise the output is 0.0.

Sign

Extracts the sign of the input value. All positive numbers will output 1.0. All negative numbers will output -1.0. And 0.0 will output 0.0.

Compare

Outputs 1.0 if the difference between the two input values is less than or equal to Epsilon.

Smooth Minimum

Smooth Minimum.

Smooth Maximum

Smooth Maximum.

Rounding

Round

Round the input value to the nearest integer.

Floor

Rounds the input value down to the nearest integer.

Ceil

Rounds the input value up to the nearest integer.

Truncate

Outputs the integer part of the value.

Fraction

Fraction.

Modulo

Outputs the remainder once the first value is divided by the second value.

Wrap

Outputs a value between Min and Max based on the absolute difference between the input value and the nearest integer multiple of Max less than the value.

Snap

Round the input value to down to the nearest integer multiple of Increment.

Ping-pong

The output value is moved between 0.0 and the Scale based on the input value.

Trigonometric

Sine

The Sine of the input value.

Cosine

The Cosine of the input value.

Tangent

The Tangent of the input value.

Arcsine

The Arcsine of the input value.

Arccosine

The Arccosine of the input value.

Arctangent

The Arctangent of the input value.

Arctan2

Outputs the Inverse Tangent of the first value divided by the second value measured in radians.

Hyperbolic Sine

The Hyperbolic Sine of the input value.

Hyperbolic Cosine

The Hyperbolic Cosine of the input value.

Hyperbolic Tangent

The Hyperbolic Tangent of the input value.

Conversion

To Radians

Converts the input from degrees to radians.

To Degrees

Converts the input from radians to degrees.

Clamp

Limits the output to the range (0.0 to 1.0). See Clamp.

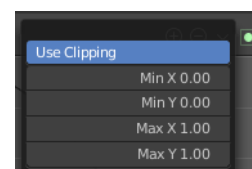
Outputs

Value

Numerical value output.

Use Clipping

Clipping options. Set up clipping for the stroke.



Delete Points

Deletes selected curve point.

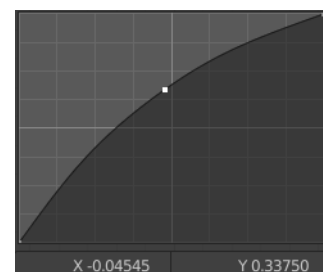
Curve window

Tweak and adjust the falloff curve by clicking at a curve point and dragging it around.

Double click adds a new point.

Holding down ctrl activates temporary snapping.

Holding down shift enables slower movement, which allows more accurate setting.



X / Y values

The x and y value of the currently selected point.

Random Value

Generates a random value.

Input

Min

The minimum value of the range. This input is only available for Float, Integer, and Vector types.

Max

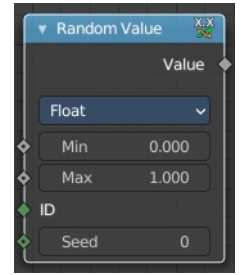
The maximum value of the range. This input is only available for Float, Integer, and Vector types.

ID

An ID to drive the random number generator seed. By default, this input uses the same value as if the ID Node, which is the id attribute of the context geometry if it exists, and otherwise the index.

Seed

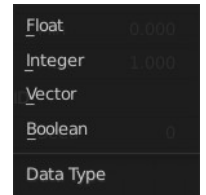
The random seed for the random number generation.



Properties

Data Type

What kind of random value to create. The items should be self explaining.



Output

Value

The output value.

Rotate Euler

Rotates an euler rotation.

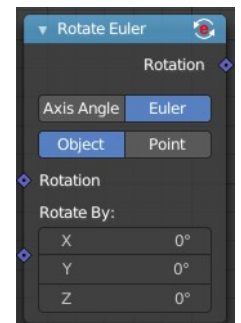
Inputs

Rotation

Use the rotation of an existing geometry.

Rotate By

The input rotation.



Properties

Rotate Type

Axis Angle

Rotate around an axis by an angle.

Euler

Rotate around the x, y and z axis.

Rotate Space

Object

Rotate points in the local space of the object.

Point

Rotate every point in its local space.

Outputs

Rotation

The euler angle output.

Switch

Switch between two inputs values based on a boolean.

Inputs

Switch

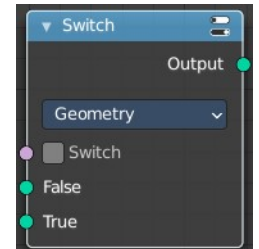
The boolean switch.

A

The input value A. Used when the switch is off.

B

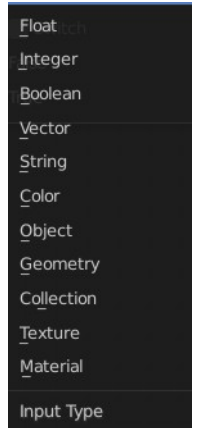
The input value B. Used when the switch is on.



Properties

Input Type

What input type the values are, which defines what type to output then.



Outputs

Output

Numerical value output.