

MAX/MSP By Example

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LESSON #5 BASIC MAX MATH

You can use MAX to perform basic mathematical operations. This can be handy in decision making, as we saw in the last lesson. MAX reads from right to left.

Note how the number that enters the right channel is stored until the left number is clicked. So this first patch (figure 5.1) results in -1, while reversing the numbers results in 1.

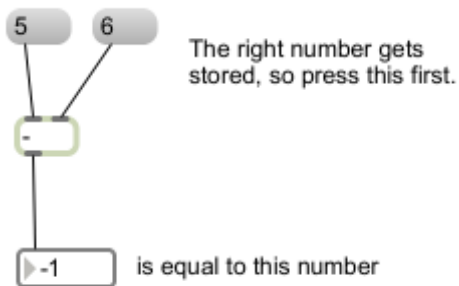


Figure 5.1 Showing right-to-left reading. The patch reads $5 - 6 = x$, even though we click on the 6 first.

We can also include the number as part of a mathematical object (Figure 5.2).

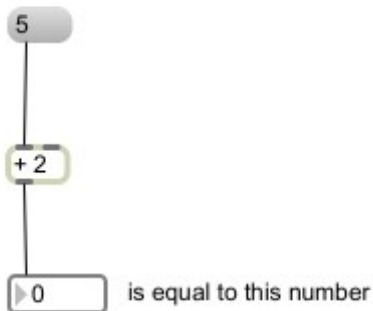


Figure 5.2 Using a number as part of a mathematical object, in this case, "2" is part of the "+" object.

Inserting a new number in the right over-rides the object's number. In Figure 5.3, $5 + 2$ is added to make 7, but if we press the "3" message box, the three over-rides the 2 and the answer becomes "8".



Figure 5.3 Over-riding an object's number by using the right inlet.

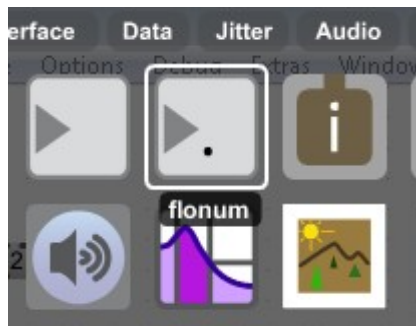
Assignment 1: Write a patch to figure out your age minus your shoe size.

Whole numbers are known as **integers**, while decimal numbers are called **floats**. Notice how, if we change our numbers to floats, when we output the operation, we get an integer. In Figure 5.4 for instance, the patch ignores the decimal place and just reads " $5 - 3 = x$ " and so outputs "2".



Figure 5.4: Float numbers get changed into integers if we use the basic operators.

If we want to get a float number as an output, we need to use a **flonum** number object.



And we need to change the “-” operator object to include floats, so I've input a dummy number (0.0) (figure 5.5).



Figure 5.5 Outputting a float by using a dummy float and the **flonum** object.

Assignment 2: Using Lesson 4, re-write the arpeggiator patch so that all C notes (which are all divisors by 12) get a major arpeggio. (Hint; use the **modulo** (%) operator and divide by twelve to calculate the remainder). Answer below.

ANSWER

