

## Understanding Modulus

Modulus is an arithmetic operation just like addition, subtraction, multiplication and division. On the computer the modulus symbol is "%." The word sounds scary but the truth is that the modulus operation is the first type of division you ever learned as a kid. Does this look familiar?

$$\begin{array}{r} 5 \text{ R}2 \\ 3 \overline{)17} \\ \underline{-15} \\ 2 \end{array}$$

$$\begin{array}{r} 3 \text{ R}3 \\ 8 \overline{)27} \\ \underline{-24} \\ 3 \end{array}$$

In elementary school we were taught to put the number we wanted to divide inside the house and the number we wanted to divide it by outside the house. We found the closest number it could divide by and then subtracted the difference. That difference we call the remainder. In the example above R2 and R3. In adult terms the remainder is called the modulus. It's that simple!

So why is knowing the modulus useful? The answer is that a modulus always creates a repeating pattern. If you use a %2 the result will always be either 0 or 1. A %3 will always give a result of either 0, 1, or 2. A %8 will always give an answer of 0,1,2,3,4,5,6, or 7. So in short the %n will always give a repeating result of 0..n-1.

Example  $n\%3$

n =	0	1	2	3	4	5	6	7	8	9
whole number	0	0	0	1	1	1	2	2	2	3
modulus	0	1	2	0	1	2	0	1	2	0