

Modulus

int Integer
Whole Numbers

$$\begin{array}{cc} + & - \\ * & \\ x / y = z \end{array}$$

$$\begin{array}{l} x + y = z \\ z - y = x \\ z - x = y \end{array}$$

$$\frac{4}{3} = 1$$

\$ 13

$$\frac{13}{5} = 2$$

$$13 \% 5 = 3^w$$

$$\begin{array}{ccc} 13 & / & 5 = 2 \\ x & y & z \end{array}$$

Remainder
Math

$$\begin{array}{ccc} z & w & x \\ z & w & y \end{array} \quad \begin{array}{l} = y \\ = x \end{array} \quad \begin{array}{l} \textcircled{1} \\ \textcircled{2} \end{array}$$

$$x / y = z$$

$$16 \quad 9$$

$$x \% y = w$$

$$5 = 3 + 2 \checkmark$$

$$(2 + 13) / 3 = 5 \checkmark$$

$$(13 - 3) / 2 = 5 \checkmark$$

~~$$y = z + x / w$$~~

$$y = \frac{(x - w)}{z}$$

$$X = (Z \cdot y) + w$$

~~$$1 + 7 = 9$$~~

$$\frac{16 - 7}{1} = 9$$

$$\begin{array}{cccccccccc}
 & 1 & 2 & 3 & 1 & 2 & 3 & 1 & 2 & 3 & 1 \\
 s_n \% 3 & 1 & 2 & 0 & 1 & 2 & 0 & 1 & 2 & 0 \\
 s_n & 1, & 2, & 3, & 4, & 5, & 6, & 7, & 8, & 9, & \dots
 \end{array}$$

$$g(s_n) \quad 1 \quad 2 \quad 3 \quad 1 \quad 2 \quad 3 \quad 1 \quad 2 \quad 3$$

$$X \% n = \quad \quad \quad X \% 3 = 0$$

$$g(s_n) = \begin{cases} 0 & \text{if } s_n \% 3 = 0 \\ 1 & \text{if } s_n \% 3 = 1 \\ 2 & \text{if } s_n \% 3 = 2 \\ 3 & \text{else} \end{cases}$$

Algorithm

$$g(S_n) = ((S_n - 1) \% 3) + 1$$

$$goal = \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array}$$

$$S_n = \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 4 & 5 & 6 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 7 & 8 & 9 \\ \hline \end{array}$$

$$S_{n-1} = \begin{array}{|c|c|c|} \hline 0 & 1 & 2 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 3 & 4 & 5 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 6 & 7 & 8 \\ \hline \end{array} (S_{n-1} \% 3)$$

$$(S_{n-1}) \% 3 = \begin{array}{|c|c|c|} \hline 0 & 1 & 2 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 0 & 1 & 2 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 0 & 1 & 2 \\ \hline \end{array} + 1$$

$$g(S_n) = \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array} \begin{array}{|c|c|c|} \hline 1 & 2 & 3 \\ \hline \end{array}$$

