

$1 \quad 1 \quad 0 \quad 0$
 $\uparrow \qquad \qquad \uparrow$
 MSB \qquad \qquad \qquad \text{LSB}

$$\frac{12}{2} = 6, \text{ remainder} \rightarrow 0$$

\uparrow
quotient

\leftarrow LSB

$$\frac{6}{2} = 3, \quad 0$$

$$\frac{3}{2} = 1, \quad 1$$

$$\frac{1}{2} = 0, \quad 1$$

\leftarrow MSD

$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 $1 \quad 1 \quad 0 \quad 0$

0 whole number
quotient

Convert decimal 19 to binary

$$19 / 2 = 9 \text{ R } 1$$

$$9 / 2 = 4 \text{ R } 1$$

$$4 / 2 = 2 \text{ R } 0$$

$$2 / 2 = 1 \text{ R } 0$$

$$1 / 2 = 0 \text{ R } 1$$

1 0 0 1 1

$$(19)_{10} = (10011)_2$$

0.625

$$2^{-1} = 0.5$$

$$2^{-2} = 0.25$$

$$2^{-3} = 0.125$$

0.5

0.25

0.125

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1

0

1

$$(0.625)_{10} = (0.101)_2$$