

Konwersja $()_{10} \Rightarrow ()_2$

$$a_n \cdot 2^n + a_{n-1} \cdot 2^{n-2} + \dots + a_1 \cdot 2^1 + a_0 \cdot 2^0 = x$$

$$? (a_n a_{n-1} \dots a_0)_2 = (x)_{10}$$

iloraz

Aby znaleźć a_i podziel x na 2, wynik $\rightarrow x_1$, reszta a_0 , $x_1 : 2 \rightarrow x_2$ - wynik, a_1 - reszta, itd.

$$\begin{array}{r} 2 \mid 19 \\ 2 \mid 9 \\ 2 \mid 4 \\ 2 \mid 2 \\ 2 \mid 1 \\ 0 \end{array} \quad \begin{array}{l} = x \\ = x_1 \\ = x_2 \\ = x_3 \\ = x_4 \\ = x_5 \end{array} \quad \begin{array}{l} a_0 = 1 \\ a_1 = 1 \\ a_2 = 0 \\ a_3 = 0 \\ a_4 = 1 \\ a_5 = 1 \end{array}$$

wiec $(19)_{10} = (10011)_2$ ■

ułamki:

$$a_1 \cdot 2^{-1} + a_2 \cdot 2^{-2} + a_3 \cdot 2^{-3} + \dots = x$$

$$? (.a_1 a_2 a_3 \dots)_2 = (x)_{10}$$

Pomnóż $x = x_1$ przez dwa: $\text{Int}(2x_1) \triangleq a_1$ (część całkowita)

$\text{Frac}(2x_1) \triangleq x_2$ (część ułamkowa),

$x_3 \triangleq \text{Frac}(2x_2)$, $a_2 \triangleq \text{Int}(2x_2) \dots$ itd

Przykład: ① $x = (5.578125)_{10}$

$$(5)_{10} = (101)_2, \quad x_1 = 0.578125$$

$2x_1 = 1.15625$	$x_2 = 0.15625$	$a_1 = 1$
$2x_2 = 0.3125$	$x_3 = 0.3125$	$a_2 = 0$
$2x_3 = 0.625$	$x_4 = 0.625$	$a_3 = 0$
$2x_4 = 1.25$	$x_5 = 0.25$	$a_4 = 1$
$2x_5 = 0.5$	$x_6 = 0.5$	$a_5 = 0$
$2x_6 = 1.0$	$x_0 = 0$	$a_6 = 1$

$$\rightarrow (5.578125)_{10} = (101.100101)_2 \quad \blacksquare$$

② $(0.1)_{10} = (0.00011001100110\dots)_2$

(skończony) $_{10} \rightarrow$ (cykliczny) $_2$