

비트별 AND

$$\begin{array}{c} 5 \\ \downarrow \end{array} \& \begin{array}{c} 3 \\ \downarrow \end{array} \Rightarrow 1$$

$$\begin{array}{r} 2 \overline{) 5} \\ 2 \overline{) 2 \dots 1} \\ \hline 1 \dots 0 \end{array} \quad \begin{array}{r} 2 \overline{) 3} \\ \hline 1 \dots 1 \end{array}$$

$$\begin{array}{r} \text{AND} \quad \begin{array}{c} 101 \ (2) \\ 011 \ (2) \\ \hline 001 \ (2) \end{array} \Rightarrow 1 \ (10) \end{array}$$

x	y	AND
1	1	1
1	0	0
0	1	0
0	0	0

비트별 OR

$$\begin{array}{r} \text{OR} \quad \begin{array}{c} 101 \ (2) \\ 011 \ (2) \\ \hline 111 \ (2) \end{array} \Rightarrow 7 \ (10) \end{array}$$

$2^2 \quad 2^1 \quad 2^0$

x	y	OR
1	1	1
1	0	1
0	1	1
0	0	0

$$2^2 \times 1 + 2^1 \times 1 + 2^0 \times 1 = 4 + 2 + 1 = 7$$

$$3 \& 3 = 3 \quad \begin{array}{r} 2 \overline{) 3} \\ \hline 1 \dots 1 \end{array}$$

$$3 \mid 3 = 3$$

$$\begin{array}{r} \text{②} \quad \begin{array}{c} 11 \ (2) \\ 11 \ (2) \\ \hline 11 \ (2) \end{array} \rightarrow 3 \ (10) \end{array}$$

$$\begin{array}{r} \text{①} \quad \begin{array}{c} 11 \ (2) \\ 11 \ (2) \\ \hline 11 \ (2) \end{array} \rightarrow 3 \ (10) \end{array}$$

XOR (exclusive OR)

배타적합

X	Y	XOR
1	1	0
1	0	1
0	1	1
0	0	0

$$\begin{array}{r} 3^{\wedge} 5 = 6 \\ \sim \\ 11(2) \quad 101(2) \end{array}$$

$$\begin{array}{r} 011(2) \\ \wedge \\ 101(2) \\ \hline 110(2) \Rightarrow 6(10) \\ 2^2 \quad 2^1 \quad 2^0 \end{array}$$

NOT

$$\begin{array}{r} \sim 3 = 0 \\ \sim \\ 11(2) \end{array}$$

$$\begin{array}{r} \sim 11 \\ \hline 00 \end{array}$$

2
2²

~~← 0 0~~ 왼쪽 이동 Shift 연산자
~~→ 0 0~~ 오른쪽 이동 $\times 2$ $\div 2$

$\leftarrow \boxed{101} (2) \Rightarrow 5 (10)$
 $\underline{10} \underline{10} (2) \Rightarrow 10 (10)$
 $\underline{10} \underline{100} (2) \Rightarrow 20 (10)$
 $2^4 \quad 2^3 \quad 2^2 \quad 2^1 \quad 2^0$
 $16 + 4$

$\underline{10} \underline{100} \underline{100} (2) \Rightarrow 10 \underline{100} \underline{100} (2)$
 $\underline{5(10)} \times 2^2 \Rightarrow \underline{20(10)}$

\rightarrow
 $100 (2) \Rightarrow 4 (10)$
 $10 (2) \Rightarrow 2 (10)$
 $1 (2) \Rightarrow 1 (10)$

$\times \frac{1}{2}$
 $\times \frac{1}{4}$

$\text{int } a = 5 \rightarrow \boxed{\boxed{101(2)}} \rightarrow \boxed{5(10) \times 2}$

$\text{int } a = 4 \xrightarrow[\times \frac{1}{2}]{> 1} \boxed{\boxed{100(2)}}$