

Binary

0 or 1 (Bits)

0 - false

1 - True

AND Operator (&&)

Truth Table

x	y	output
0	0	0
0	1	0
1	0	0
1	1	1

Insertion sort

True AND

while(j > 0 &&)

cond 2)

{

True

}

100 (4)

101 (5)

AND

100 (output) → 4 answer

OR operator (||)

x	y	output
0	0	0
0	1	1
1	0	1
1	1	1

100 (4)

101 (5) OR

101 (output)

5 answer

NOT OPERATORS

$$!1 = 0$$

$$!0 = 1$$

XOR Operators =

Truth
Table

x	y	output (A XOR B)
0	0	0
0	1	1
1	0	1
1	1	0

$$x = 101 (5)$$

$$y = 111 (7) \quad \boxed{\text{XOR}}$$

$$\underline{\quad 010 \quad (2) \quad}$$

Left Shift operator

←←

$$\underline{1100110010} = 818$$

$$\underline{11001100100} = 1636$$

$$(818 * 2)$$

$$\begin{aligned}
 100 &= 4 \\
 100\textcircled{0} &= 8 \quad (4 \times 2^1) \quad \text{--- left} \\
 100\textcircled{0}\textcircled{0} &= 16 \quad (4 \times 2^2) \quad \text{Shift by 1}
 \end{aligned}$$

Meaning of using
Left Shift
Operator

Left shift by 2

$$x \ll y = x \times 2^y$$

$$4 \ll 3 = 4 \times 2^3$$

Right shift Operator

\gg

$$1100110010 = 818$$

$$\begin{aligned}
 \textcircled{0}110011001 &= 409 \\
 \text{---} & \quad \begin{array}{l} 409 \\ (818) \\ \hline \cancel{x} \end{array} \quad (818 \times 2^{(-1)})
 \end{aligned}$$

$$1000 = 8$$

$$0100 = 4 \quad (8 \times 2^{(-1)})$$

$$0010 = 2 \quad (8 \times 2^{(-2)})$$

$$x \gg y = \underline{x * (2^{(-y)})}$$

$$\frac{x}{2^y}$$

$$40 \gg 3 = \frac{40}{2^3} = \frac{40}{8} = 5$$