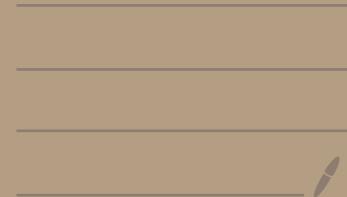


# DSA DAY 10 ~ OPERATORS

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Sunfire Senshi



$+ , - , \times , \div , \cdot , /$

{ BODMAS }  
Left to Right

Brackets   Order   Division   Multiplication  
Addition   Subtraction.

# Arithmetic Operator ?

**Unary**  
1 operand

**Binary**  
2 operand

- + ,
- - ,
- \* ,
- / ,
- $\cdot$   $\%$

$$\frac{13}{3} = \textcircled{4.3} \times$$

$$\frac{12}{3} = 4$$

$$\frac{13}{3} = 4\checkmark$$

$$\frac{12.3}{3} = \textcircled{4.1}\checkmark$$

int < float < double

$$12.6 \times 3 \\ - 37.8 \\ \hline 12 \times 3 \\ 86$$

$$2+2=4 \\ \textcircled{3}-\textcircled{2}=1 \\ 3 \times 2=6 \\ \textcircled{6} \times 1.4=\underline{3}$$

$$12 \times 3 + 6 - 3 \times 1.4 / 2$$

$\{ \underline{*}, \underline{/}, \underline{\cdot}, \underline{-}, \underline{+}, \underline{=} \}$

Associativity → left to right

$$\underline{4} \underline{2} \underline{+} \underline{3} \underline{\times} \underline{4} \underline{/} \underline{3} \underline{-} \underline{2} \underline{\cdot} \underline{8}$$

Unary      operator  
                  L operand

$\underline{++}, \underline{-}$

increment      decrement

increment

① Post inc

$x + f$   
inc  
 $+ f x$

② Pre inc

$$x = 10$$

$x++$   
 $++x$

$y = n++$

$$y = 10$$

$y = ++n$      $x = n + 1$   
 $y = 11$

Decrement

③ Post dec

$x--$

④ Pre dec

$--x$

$$x = 10$$

$x--$

$--x$

$$x = x - 1$$

$y = n--$

$y = 10$   
 $y = --n$   
 $y = 9$

## 2. Comparison Operator

$\{ =, >, <, \leq, \geq, != \}$

$\{ >, <, \leq, \geq \} > \{ =, != \}$

left to right

$3 == 4$   
0

$6 != 4$   
1

$3 < 3$   $| O \& L$   
~~imp~~ \*  $15 > 14 > 11$   
1  
0

$$\underbrace{15 > 13}_{1} < 4 = = 1$$

$$\underbrace{1 < 4}_{1} = = 1$$

$$1 = = 1$$

L

$$\overline{15 > 18} > \cancel{99} \neq 0$$

$$\overline{0 > 99} \neq 0$$

$$\overline{0 \neq 0}$$

D

# Logical Operator

And      OR      NOT  
 $\wedge$        $\vee$        $!$

not

1	0	0	0
0	1	1	1
1	0	1	1
1	1	0	1
1	1	1	0

$$\begin{array}{l} 0115 = 1 \\ 0110 = 0 \\ 1116 = 1 \end{array}$$

0	1
1	0

$$\begin{array}{l} 0\&0\&5 = 0 \\ 0\&0\&0 = 0 \\ 1\&0\&6 = 1 \end{array}$$

in	in	out
0	0	0
0	1	0
1	0	0
1	1	1

$$\begin{array}{l} !5 = 0 \\ !0 = 1 \end{array}$$

x  
y  
z

x>y  
x>z

```
if(x>y){  
    if(x>z){  
        cout << "x is greater"  
    }  
    else  
        cout << "not greater"  
}  
else {  
    cout << "not greater"  
}
```

# Bitwise Operator

{ & , | , ^ , ~ , << , >>  
And OR XOR Complement  
Left shift Right shift }



$$2 \& 3 = 2$$

$$\begin{array}{r} \text{And} \\ \begin{array}{r} 10 \\ 11 \\ \hline 10 \rightarrow 2 \end{array} \end{array}$$

$$2 \oplus 3 = 3$$

$$\begin{array}{r} \text{XOR} \\ \begin{array}{r} 10 \\ 11 \\ \hline 11 \rightarrow 3 \end{array} \end{array}$$

XOR

	0	1	0
	0	1	1
f	0	0	1
1	1	1	0

$$2 \wedge 3 = 1$$

$$\begin{array}{r}
 10 \\
 11 \\
 \hline
 01 \rightarrow 1
 \end{array}$$

$\ll$

$\boxed{\text{num} \times 2^x}$

$\overset{\text{num}}{\curvearrowright} \overset{x}{\curvearrowright}$   
6  $\lll$

6  $\lll$

6  $\lll$

0 - - - 0 0 0 | 1 1 0  $\rightarrow 6$

0 - - - 0 0 0 | 1 1 0  $\rightarrow 12$

0 - - - 0 1 1 0 0 0  $\rightarrow 24$

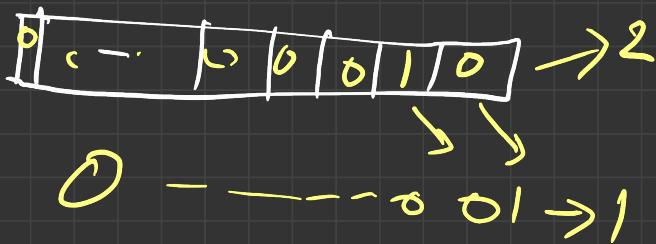
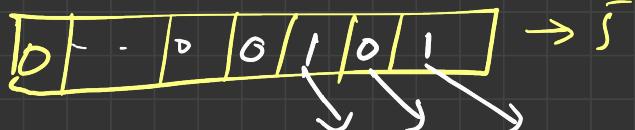
1 1 0 0 0 0  $\rightarrow 48$

Right shift >>

$s \gg 1$

$s \gg 2$

$\frac{\text{Num}}{2^x}$



$0 - \dots 0 \rightarrow 1$

complement

$\sim \boxed{\sim 5}$

$0 - \sim 00101$   
1  $\sim -11010$  - vc  
↓

L's  $\rightarrow 0 - \sim 000101$   
+1  
2's  $\rightarrow \underline{0} - \sim 00110$

$$\begin{aligned}\sim 5 &= -6 \\ \sim 6 &= -7 \\ \sim 99 &= -100 \\ \sim 10 &= -11 \\ \sim -11 &= 10\end{aligned}$$

{ <<, >> } { &, |, ^ }

Left ~ Right

# Assignment Operator

$a += 3$   
 $a = a + 3$

$a -= 8$   
 $a = a - 8$

$\overline{=}$   
=>

$a *= 4$   
 $a = a * 4$

$a /= 7$   
 $a = a / 7$

$x = 4$

$b = 6$   
 $y = b$

$a = 8$

$y = 6$

$a \% = 8$   
 $a = a \% 8$

{ $(0 \times 5 + 3) / 6 > 3 \wedge 4 \leq 3$  } 21/44 ~5}