

# Ch4: Basic Operators

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# Arithmetic Operators

Operator	Name	Example
+	Addition	$2 + 3$
-	Subtraction	$2 - 3$
*	Multiplication	$2 * 3$
/	Division	$2 / 3$
%	Modulus	$2 \% 3$
**	Exponentiation	$2^{**}3$
//	Floor Division	$10//3$

# Assignments Operators

Operator	Example	Same as
<code>x = 5</code>	<code>x = 5</code>	<code>x = 5</code>
<code>+=</code>	<code>x += 3</code>	<code>x = x + 3</code>
<code>-=</code>	<code>x -= 3</code>	<code>x = x - 3</code>
<code>*=</code>	<code>x *= 3</code>	<code>x = x * 3</code>
<code>/=</code>	<code>x /= 3</code>	<code>x = x / 3</code>
<code>%=</code>	<code>x %= 3</code>	<code>x = x % 3</code>
<code>//=</code>	<code>x //= 3</code>	<code>x = x // 3</code>
<code>**=</code>	<code>x **= 3</code>	<code>x = x ** 3</code>

# Bitwise Operators

Operator	Name	Description	Example
&	Bitwise AND	Each bit of the output is 1 if the corresponding bit of x AND of y is 1, otherwise it's 0.	$5 \& 3 = 1$
	Bitwise OR	Each bit of the output is 0 if the corresponding bit of x AND of y is 0, otherwise it's 1.	$5   3 = 7$
~	Bitwise NOT	Returns the complement of x - the number you get by switching each 1 for a 0 and each 0 for a 1. This is the same as $-x - 1$ .	$\sim 5 = -6$
^	Bitwise XOR	Each bit of the output is the same as the corresponding bit in x if that bit in y is 0, and it's the complement of the bit in x if that bit in y is 1.	$5 \wedge 3 = 6$
>>	Left shift	Returns x with the bits shifted to the left by y places (and new bits on the right-hand-side are zeros).	$5 \gg 3 = 0$
<<	Right shift	Returns x with the bits shifted to the right by y places. This is the same as multiplying x by $2^{**}y$ .	$5 \ll 3 = 40$

# Assignment Bitwise Operators

Operator	Example	Same as
<code>&amp;=</code>	<code>x &amp;= 3</code>	<code>x = x &amp; 3</code>
<code> =</code>	<code>x  = 3</code>	<code>x = x   3</code>
<code>^=</code>	<code>x ^= 3</code>	<code>x = x ^ 3</code>
<code>&gt;&gt;=</code>	<code>x &gt;&gt;= 3</code>	<code>x = x &gt;&gt; 3</code>
<code>&lt;&lt;=</code>	<code>x &lt;&lt;= 3</code>	<code>x = x &lt;&lt; 3</code>