

Lesson 3: Operators

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1 Lesson 3: Operators

In this lesson, we will learn about...

- Arithmetic operators
- Assignment operators
- Comparison operators
- Logical operators
- Membership operators

2 Arithmetic Operators

These are used with numbers to perform mathematical operations.

```
[1]: x = 5
      y = 3

      print( x + y )
      print( x - y )
      print( x * y )
      print( x / y )
      print( x % y )
      print( x ** y )
      print( x // y )
```

```
8
2
15
1.6666666666666667
2
125
1
```

Operator	Name	Notes
+	Addition	
-	Subtraction	

Operator	Name	Notes
*	Multiplication	
/	Division	Will return <code>float</code>
%	Modulus	Remainder of $x \div y$
**	Exponentiation	x^y
//	Integer Division	Truncates decimal

3 Assignment Operators

These work like the arithmetic operators, but variable being assigned is part of the equation.

```
[2]: x = 5
      x += 3
      print(x)

      x = 5
      x -= 3
      print(x)

      x = 5
      x *= 3
      print(x)
```

8
2
15

```
[3]: x = 5
      x /= 3
      print(x)

      x = 5
      x %= 3
      print(x)

      x = 5
      x **= 3
      print(x)

      x = 5
      x // = 3
      print(x)
```

1.6666666666666667
2

Operator	Name	Same As
+=	Addition	x=x+3
-=	Subtraction	x=x-3
*=	Multiplication	x=x*3
/=	Division	x=x/3
%=	Modulus	x=x%3
=	Exponentiation	x=x3
//=	Integer Division	x=x//3

4 Comparison Operators

These are used to compare two values, and always return a `bool`. They become more useful when we talk about `if...else` and loops later on.

```
[4]: print( 3 == 5 )  
      print( 3 != 5 )  
      print( 3 > 5 )  
      print( 3 < 5 )  
      print( 3 >= 5 )  
      print( 3 <= 5 )
```

```
False  
True  
False  
True  
False  
True
```

5 Logical Operators

These are primarily used in `if...else` and loops to combine multiple expressions.

```
[5]: print( True and False )  
      print( True or False )  
      print( not True )
```

```
False  
True  
False
```

5.1 and Truth Table

x	y	x and y
True	True	True
True	False	False
False	True	False
False	False	False

5.2 or Truth Table

x	y	x or y
True	True	True
True	False	True
False	True	True
False	False	False

6 Membership Operators

These are used to test if a sequence is present in an object. Recall that we saw this with strings, and will again with more complex data structures.

```
[6]: print( "e" in "Hello" )  
     print( "e" not in "Hello" )
```

```
True  
False
```

7 Order of Operations

1. Parenthesis
2. Exponents
3. Multiplication, Division, Modulus
4. Addition, Subtraction
5. Comparisons, Membership, Identity
6. not
7. and
8. or