



Topic 9: JavaScript

Arithmetic and Assignment Operators

Lecture Contents



- Operator Types
- Arithmetic Operators
- Modulus
- Operator Precedence
- Increment / Decrement

Operator Types

- *Arithmetic*
- *Assignment*
- *Comparison*
- *Logical*
- *Bitwise*

JavaScript Arithmetic Operators

- We should know the word “***operator***” from mathematics
- JavaScript ***arithmetic operators***:
 - Add: $x + y$
 - Subtract: $x - y$
 - Multiply: $x * y$
 - Divide: x / y
 - Modulus: $x \% y$
 - Exponent: $x ** y$ // ES2016; not in Java or C

Modulus

- Modulus (%) gives the remainder:
 - $17 \% 3 == ?$

Modulus

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 - $17 \% 3 == 2$

Modulus

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- How to determine if a number is even or odd?

Modulus

- Modulus (%) gives the remainder:
 - $17 \% 3 == 2$
- How to determine if a number is even or odd?
 - $n \% 2 \rightarrow 0$ if *even*, 1 if *odd*

JavaScript Operator Precedence

Level	Description	Operators
18	parentheses	()
13	exponentiation	**
12	multiplicative	* / %
11	additive	+ -

Assignment Operators

- An ***assignment operator*** is used to set the value of a variable.
- We first ***declare*** a variable:

```
var name;
```

- The first time we set a value, we ***initialize*** the variable

```
name = "Chris";
```

or: var name = "Chris";

- Any time we set a value, we ***assign*** a value
(initialization is a subset of assignment)

```
var name = "Chris";  
name = name.toUpperCase();
```

← declaration and initialization

← assignment

Arithmetic Assignment Operators



- Type the following in a console:

```
> num = 5;  
> num += 3;
```

Arithmetic Assignment Operators



- Type the following in a console:

```
> num = 5;  
> num += 3;
```

- The result should be 8.
 - These show equivalent statements using the basic ***assignment*** operator, **=**, and the ***addition assignment*** operator, **`+=`**, is

`num = num + 3;` `num += 3;`

Assignment Operators

- The basic assignment operator is the equal sign, `=`
- All other arithmetic, logical, and bitwise operators have an assignment equivalent.

Arithmetic	Logical	Bitwise
<code>+=</code>	<code>&&=</code>	<code>&=</code>
<code>-=</code>	<code> =</code>	<code> =</code>
<code>*=</code>	<code>??=</code>	<code>^=</code>
<code>/=</code>		<code><<=</code>
<code>%=</code>		<code>>>=</code>
<code>**=</code>		<code>>>>=</code>

Increment / Decrement Operators

- Increment: `++` Decrement: `--`
- These are equivalent statements:

Increment	Decrement
<code>x = x + 1;</code>	<code>x = x - 1;</code>
<code>x += 1;</code>	<code>x -= 1;</code>
<code>x++;</code>	<code>x--;</code>



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Variables