

Comp 125 - Visual Information Processing

Spring Semester 2018 - week 2 - wednesday

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JS Basics - type conversion

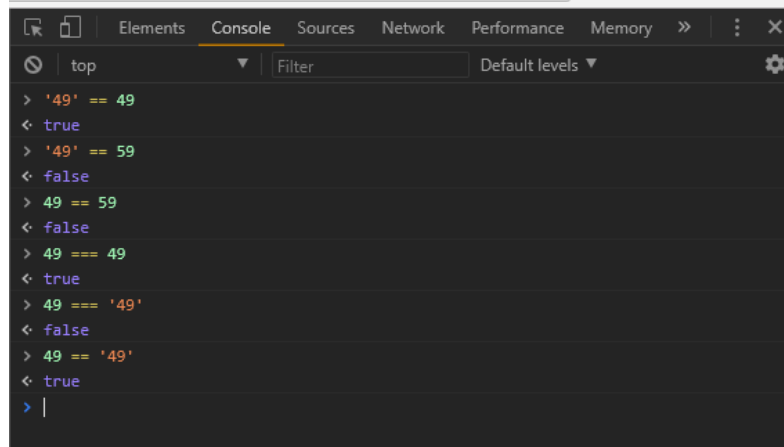
- option and ability to convert types in JS
 - in effect, **coerce** our values and types from one type to another
- convert a number, or coerce it, to a string
- built-in JS function, `Number ()`, is an explicit coercion
 - explicit coercion, convert any type to a number type
- implicit coercion, JS will often perform as part of a comparison

```
"49" == 49
```

- JS implicitly coerces left string to a matching number
 - then performs the comparison
- often considered bad practice
 - convert first, and then compare
- implicit coercion still follows rules
 - can be very useful

JS Basics - examples of coercion - part I

Coerce strings and numbers...

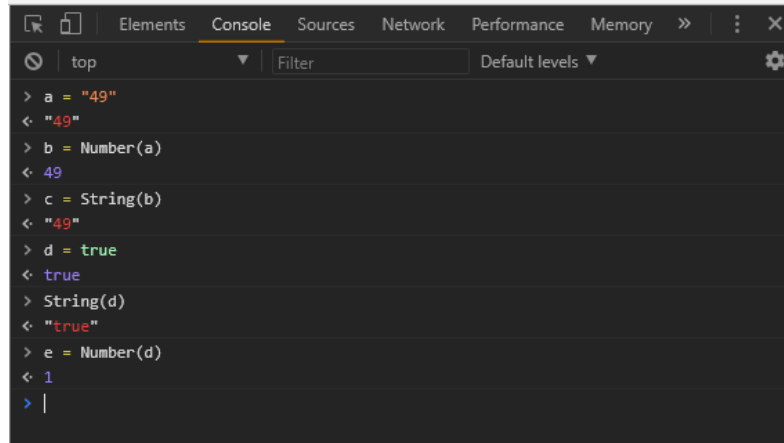
A screenshot of a web browser's developer console, specifically the 'Console' tab. The console shows a series of JavaScript commands and their results, demonstrating type coercion. The commands and results are: '> '49' == 49' returns 'true'; '> '49' == 59' returns 'false'; '> 49 == 59' returns 'false'; '> 49 === 49' returns 'true'; '> 49 === '49'' returns 'false'; and '> 49 == '49'' returns 'true'. The console interface includes a search bar at the top with 'top' and 'Filter' options, and a 'Default levels' dropdown on the right. The background of the console is dark with light-colored text.

```
> '49' == 49
< true
> '49' == 59
< false
> 49 == 59
< false
> 49 === 49
< true
> 49 === '49'
< false
> 49 == '49'
< true
> |
```

JavaScript - examples of type coercion

JS Basics - examples of coercion - part 2

Coerce strings, numbers, booleans...

A screenshot of a web browser's developer console, specifically the 'Console' tab. The console shows a series of JavaScript commands and their outputs, demonstrating type coercion. The commands and outputs are: 1. Command: > a = "49"; Output: < "49" (a string). 2. Command: > b = Number(a); Output: < 49 (a number). 3. Command: > c = String(b); Output: < "49" (a string). 4. Command: > d = true; Output: < true (a boolean). 5. Command: > String(d); Output: < "true" (a string). 6. Command: > e = Number(d); Output: < 1 (a number). The console interface includes a search bar at the top with 'top' and 'Filter' options, and a 'Default levels' dropdown menu. The background of the console is dark with light-colored text.

```
> a = "49"
< "49"
> b = Number(a)
< 49
> c = String(b)
< "49"
> d = true
< true
> String(d)
< "true"
> e = Number(d)
< 1
> |
```

JavaScript - examples of type coercion

JS Basics - variables - part I

- **symbolic** container for values and data
- applications use containers to keep track and update values
- use a **variable** as a container for such values and data
 - *allow values to vary over time*
- JS can emphasize types for values, does not enforce on the variable
 - **weak typing** or **dynamic typing**
 - *JS permits a variable to hold a value of any type*
- often a benefit of the language
- a quick way to maintain flexibility in design and development

JS Basics - variables - part 2

- declare a variable using the keyword `var`
- declaration does not include **type** information

```
var a = 49;  
//double var a value  
var a = a * 2;  
//coerce var a to string  
var a = String(a);  
//output string value to console  
console.log(a);
```

- `var` `a` maintains a running total of the value of `a`
- keeps record of changes, effectively **state** of the value
- **state** is keeping track of changes to any values in the application

JS Basics - variables - part 3

- use variables in JS to enable central, common references to our values and data
- better known in most languages simply as **constants**
- JS is similar
 - *creates a read-only reference to a value*
 - *value itself is not immutable, e.g. an object...*
 - *it's simply the identifier that cannot be reassigned*
 - *JS constants are also bound by scoping rules*
- allow us to define and declare a variable with a value
 - *not intended to change throughout the application*
- **constants** are often declared together
 - *uppercase is standard practice - although not a rule...*
- form a store for values abstracted for use throughout an app
- JS normally defines constants using uppercase letters,

```
var NAME = "Philae";
```

- ECMAScript 6, ES6, introduces additional variable keywords
 - e.g. *const*

```
const TEMPLE_NAME = "Philae";
```

- benefits of abstraction, ensuring value is not accidentally changed
 - *change rejected for a running app*
 - *in strict mode, app will fail with an error for any change*

JS Basics - comments

- JS permits comments in the code
- two different implementations

single line

```
//single line comment  
var a = 49;
```

multi-line

```
/* this comment has more to say...  
we'll need a second line */  
var b = "forty nine";
```

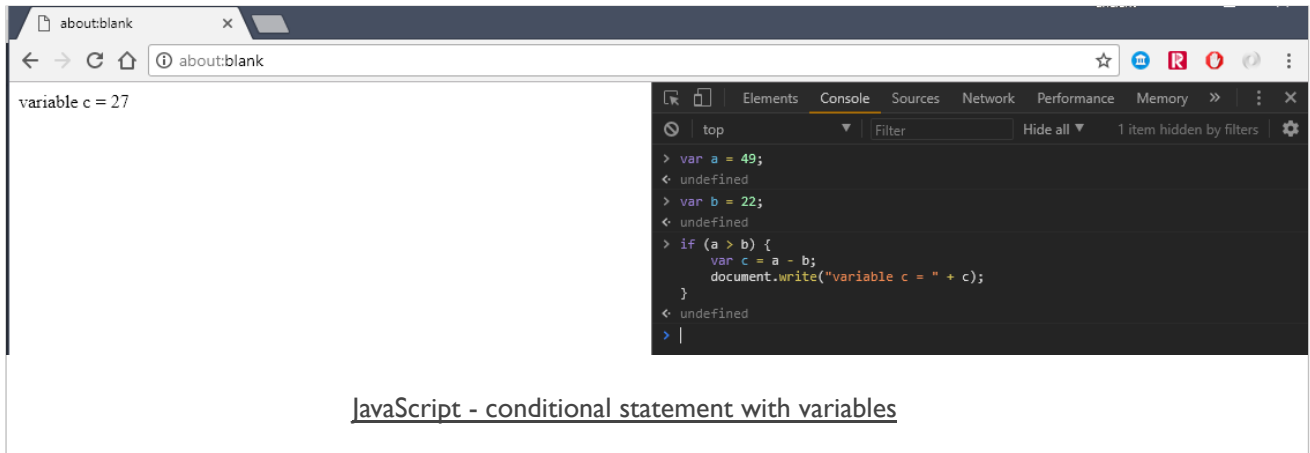

JS Basics - logic - blocks & conditionals - part I

- simple act of grouping contiguous and related code statements together
 - *known as **blocks***
- block defined by wrapping statements together
 - *within a pair of curly braces, { }*
- **blocks** commonly attached to other forms of control statement

```
if (a > b) {  
  ...do something useful...  
}
```

- conditional statements require a decision to be made
- JS includes many different ways we can express **conditionals**
- most common example is the `if` statement
 - *if this given condition is true, do the following...*
 - *if statement requires an expression between the parentheses*
 - *evaluates as either true or false*

JS Basics - logic - conditional statement



The screenshot shows a web browser window with a single tab titled 'about:blank'. The address bar also displays 'about:blank'. The main content area of the browser is empty, except for the text 'variable c = 27' which appears to be the output of the script. On the right side, the browser's developer tools are open, specifically the 'Console' tab. The console shows the following JavaScript code being executed:

```
> var a = 49;  
< undefined  
> var b = 22;  
< undefined  
> if (a > b) {  
    var c = a - b;  
    document.write("variable c = " + c);  
}  
< undefined  
> |
```

Below the browser window, the text JavaScript - conditional statement with variables is displayed.