JavaScript

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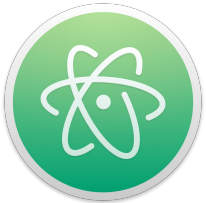
Introduction: What is JavaScript?

- Main scripting language of websites
- Allows for dynamic content
- Contains object oriented features
- Weakly typed

Setup

- Text Editor (Sublime Text, Atom, etc.)
- Browser (preferably Chrome or Firefox)
    - JavaScript Console

Using JavaScript

- Developer Console (Chrome, Firefox)
- Online Editor (https://repl.it/languages/javascript)
- Attach script to HTML webpage
  - by reference:

```
<script src="main.js"></script>
```

  - inline:

```
<script>
// code
</script>
```

Variables

```
var message = “Hello!”;
```

Type	Examples
Number	5, 3.14, NaN
String	“John Smith”
Boolean	true, false
Object	{}, {x: 0, y: 1}, [1, 2, 3], null
Function	Math.abs
Undefined	undefined

Arrays

- Dynamically sized
- Generic

```
var arr = [1, 2, “dog”, null];
arr[2];   // dog
arr.length;   // 4

var arr2d = [ [1, 2, 3], [4, 5, 6] ];
arr2d[1][1];   // 5
```

Truthiness

Type	Falsy	Truthy
Number	0, NaN	all other numbers
String	“”	all other strings
Boolean	false	true
Object	null	all other objects
Function	n/a	all functions
Undefined	undefined	n/a

Conditional Statements

```
if (x % 2 == 0) {
  console.log(“even”);
} else {
  console.log(“odd”);
}

if (val) {
  console.log(val);
}
```

Equality

- Abstract Equality (==)
  - Tries to resolve types before comparing
- Strict Equality (===)
  - Returns false if the types are different

Equality

```
5 == “5”
```
true

```
5 === “5”
```
false

```
0 == false
```
true

```
0 === false
```
false

```
“john” == “john”
```
true

```
“john” === “john”
```
true

Loops

```
for (var i = 1; i <= 10; i++) {
  console.log(i);
}

var i = 1;
while (i <= 10) {
  console.log(i);
  i++;
}
```

Functions

```
function add(x, y) {
  return x + y;
}

var multiply = function(x, y) {
  return x * y;
}

add(3, 4);
add(“John ”, “Smith”);
```

Miscellaneous Syntax

- Comments
  - Single-line: //
  - Multi-line: /* */
- Semicolons
  - Optional, but good practice
- Adding string and another value casts to string
  - “high ” + 5 becomes “high 5”

Practice

1. Write a function that when given a number n as input, prints the nth term of fibonacci. (ex: fib(0) = 1, fib(1) = 1, fib(2) = 2)
2. Write a function that calculates the average of an array of numbers. (Bonus: include values in the array that are not numbers and ignore them)
3. Print out the multiplication table for numbers up to 10.
4. Write a function that determines if a number is prime.

Objects

- Mappings between keys and values
- Defining objects

```
var coord = {
  x: 5,
  y: -3
};
```

- Accessing properties

```
coord.x
coord[“x”]
```

Objects

```
var myPerson = {
  name: “Joseph”,
  “age”: 19,
  eat: function (food) {
    console.log(this.name + “ ate ” + food);
  }
};

console.log(myObj[“bday”]);    // undefined
myObj[“bday”] = “3/8/1918”;
myObj.age = 100;
```

Constructors

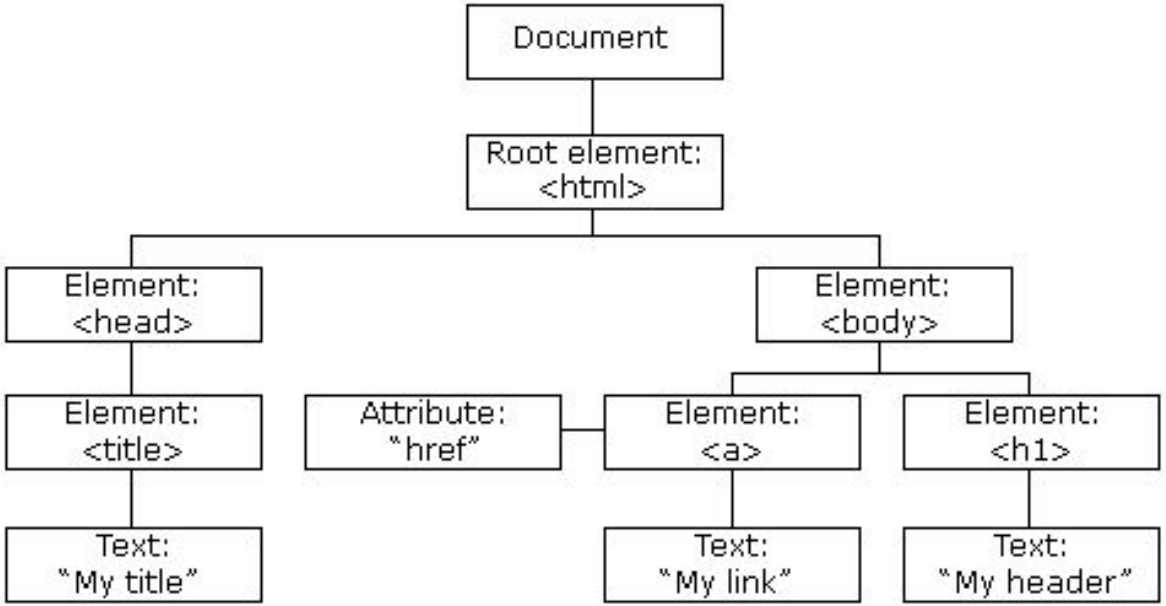
- Construct objects similarly to using a class

```
function Person(name, age) {
  this.name = name;
  this.age = age;
  this.eat = function (food) {
    console.log(“yummy!”);
  };
}

var myPerson = new Person(“Tom”, 18);
```

Interacting with the DOM

- The HTML DOM is the Document Object Model for a web page



Interacting with the DOM

- document.getElementById(id)
  - Makes a reference to the HTML element with an id of id
- element.innerHTML
  - Read or edit the contents of element's inner HTML
- element.onclick
  - Assign a function to be called when element is clicked

```
var nameTag = document.getElementById("name");
nameTag.innerHTML = "Nathan"
```

Lab

https://scottylabs.org/wdw/javascript/lab/