

Javascript

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# Introduction

# Javascript (aka Ecmascript)

- Scripting language (dynamically and weakly typed)
- Object-oriented (first prototype-based and now class-based)
- Functional (first-class functions)
- Reflexive (eval method) ... although it is not a good thing.

⦿ It has absolutely nothing to do with Java

“Java is to Javascript is what a car is to a carpet”

# The (from-the-past) alternatives to JavaScript

Third-party plugins were used to palliate to the lacks of Javascript:

- Java applets
- Flash
- Silverlight
- and so on

# Why Javascript is ahead in the game now?

- Open and standard (multi platforms)
- Come for free on many browsers/platforms
- Javascript engines are getting “incredibly” faster
- HTML 5
- Javascript is getting out of the browser (Node.js)



# Elements of Syntax

# Comments

```
// This is a comment
```

```
/* This is  
another one */
```

# Debug message on the console

```
console.log("Houston, there is a problem");
```



# Constants and Variables - var vs let

```
var name = "Alice";  
var age = 28;
```

old way  
(should not be used)

```
let name = "Alice";  
let age = 28;
```

new since es6

```
const name = "Alice";  
const age = 28;
```

# IF statement

```
if ( (age<20 && name="Alice") || (age>=20) ) {  
    age = age + 1;  
}  
else{  
    name = "Alice " + "Alicson";  
}
```

else statement is optional

Look at the operator switch as well

# Loops

```
let i = 0;  
while (i<100) {  
    console.log(i++);  
}
```

```
for (let i=0; i<100; i++) {  
    console.log(i);  
}
```

# First-class functions

```
function getAge() {  
    return 28;  
};
```

```
getAge();
```

or

```
const getAge = function() {  
    return 28;  
};
```

```
getAge();
```

or

```
const getAge = () => 28;  
getAge();
```

Anonymous functions will be very  
useful for object methods and  
callback methods

# Prototype-Based Object-Oriented

```
// defining a constructor
function Person(name) {
    this.name = name;
}

// adding a method
Person.prototype.getName = function() {
    return this.name;
};

// creating an object
const p = new Person('Mariam');
console.log(p.getName());
console.log(p.constructor.name);
console.log(p instanceof Person);
```



# Prototype-based Inheritance

```
// defining a constructor calling a super class
function Employee(name, title){
    this.title = title;
    Person.call(this, name);
}
```

```
// setting up the inheritance
Employee.prototype = new Person();
```

```
// fixing the constructor
Employee.prototype.constructor = Employee;
```

```
// creating an object
const e = new Employee('Mariam', 'CEO');
console.log(e.getName());
console.log(e.title);
console.log(e.constructor.name);
console.log(e instanceof Employee);
console.log(e instanceof Person);
```

# Class-based Object-Oriented

```
// Defining a class
class Person() {

    constructor(name) {
        this.name = name;
    }

    get name() {
        return this.name;
    }

}

// creating an object
const p = new Person('Mariam');
console.log(p.name());
```

# Class-based Inheritance

```
// Defining a class that inherits
class Employee extend Person{

  constructor() {
    Person.call(this, name);
    this.title = title;
  }

}

// creating an object
const e = new Employee('Mariam', 'CEO');
console.log(e.name());
console.log(e.title);
```

# Data Structures

# Arrays

```
const myArray = new Array();  
myArray[0] = "JavaScript";  
myArray[1] = "is";  
myArray[2] = "fun";
```

Or

```
const myArray = new Array ("Javascript","is","fun");
```

Or

```
const myArray = ["Javascript","is","fun"];
```



# Iterate through arrays

```
const myArray =  
["Javascript", "is", "fun"];
```

```
for (let i=0; i<myArray.length; i++) {  
    console.log(myArray[i]);  
}
```

```
for (let x of myArray) {  
    console.log(x);  
}
```

```
myArray.forEach(function(x) {  
    console.log(x);  
})
```

# Associative Arrays (aka Hashtables or Dictionaries)

```
const myDict = new Object();  
myDict["first"] = "JavaScript";  
myDict["second"] = "is";  
myDict["third"] = "fun";
```

Or

```
const myDict = {};  
myDict.first = "JavaScript";  
myDict.second = "is";  
myDict.third = "fun";
```

Or

```
const myDict = {first: "Javascript",  
                 second: "is",  
                 third: "fun"}
```

# Iterate through associative arrays

```
const person = {  
  fname: "Alice",  
  lname: "Alicson",  
  age: 30  
};
```

```
for (let k in person) {...}
```

```
for (let k of Object.keys(person)) {...}
```

```
for (let v of Object.values(person)) {...}
```

```
for (const [k, v] of Object.entries(person)) {...}
```