



# Objects & Data in JavaScript



# Some familiar pieces of the JavaScript language...

**Variable**    `var cheese = "yummy";`

**Array**       `var animals = ["chicken", "llama", "snake", "turtle"];`

Many languages, such as PHP, have associative arrays, but JavaScript does not. Instead it has objects.

`<?php`

`$person = [ "firstname" => "John", "lastname" => "Smith"];`

`?>`

# JavaScript Object Literal

```
var person = { firstname: "John", lastname: "Smith", age: 25 };  
  
console.log( person.firstname );
```

Objects are often formatted like this.

```
var person = {  
    firstname: "John",  
    lastname: "Smith",  
    age: 25  
};  
  
console.log( person.lastname );
```

# JavaScript Object - Key / Value Pairs

Notice the key : value pairs

```
var person = {  
  firstname: "John",  
  lastname: "Smith",  
  age: 25  
};
```

The keys don't go inside quotes. Neither does 25, as it is a number and JavaScript knows what that means.

# JavaScript Object Keyword

You can create an object like this too...

```
var person = new Object();  
  
person.firstname = "John";  
person.lastname = "Smith";  
person.age = 25;
```

There is really no advantage to creating an object this way, and you are more likely to see it the previous way.

# Objects can contain arrays and other objects

Notice the array and the object inside the object.

```
var person = {  
  firstname: "John",  
  lastname: "Smith",  
  pets: ["dog", "cat", "chicken", "llama"],  
  phonenumber: {  
    home: "916-123-4567",  
    work: "916-432-8765",  
    cell: "916-456-7890"  
  }  
};
```

```
console.log( person.pets[2] );  
console.log( person.phonenumber.home );
```

# Objects can contain functions

Because functions are first class in JavaScript, you can do this...

```
var person = {  
  firstname: "John",  
  lastname: "Smith",  
  greeting: function() { console.log("hello!"); }  
};  
  
person.greeting();
```

# Functions inside objects are called methods

Notice the use of the keyword **this**. **This** refers to this object.

```
var person = {  
  firstname: "John",  
  lastname: "Smith",  
  greeting: function() {  
    console.log(`hello ${this.firstname} ${this.lastname}` )  
  }  
};  
  
person.greeting();
```



# Object constructor

Constructor functions are useful for creating reusable object templates...

```
function Person(first, last, age, eye) {  
    this.firstName = first;  
    this.lastName = last;  
    this.age = age;  
    this.eyeColor = eye;  
}  
  
var myFather = new Person("John", "Doe", 50, "blue");  
var myMother = new Person("Sally", "Rally", 48, "green");
```

Note the use of the **new** keyword.

# Putting Objects and Functions Together...

```
function printableMessage() {  
  var message = 'hello';  
  
  function printMessage() {  
    console.log(message); }  
  
  function setMessage(newMessage) {  
    message = newMessage; }  
  
  return {  
    printMessage: printMessage,  
    setMessage: setMessage  
  };  
}
```

## Pattern in use

```
var awesome1 = printableMessage();  
awesome1.printMessage();
```

```
var awesome2 = printableMessage();  
awesome2.setMessage('hi');  
awesome2.printMessage();
```

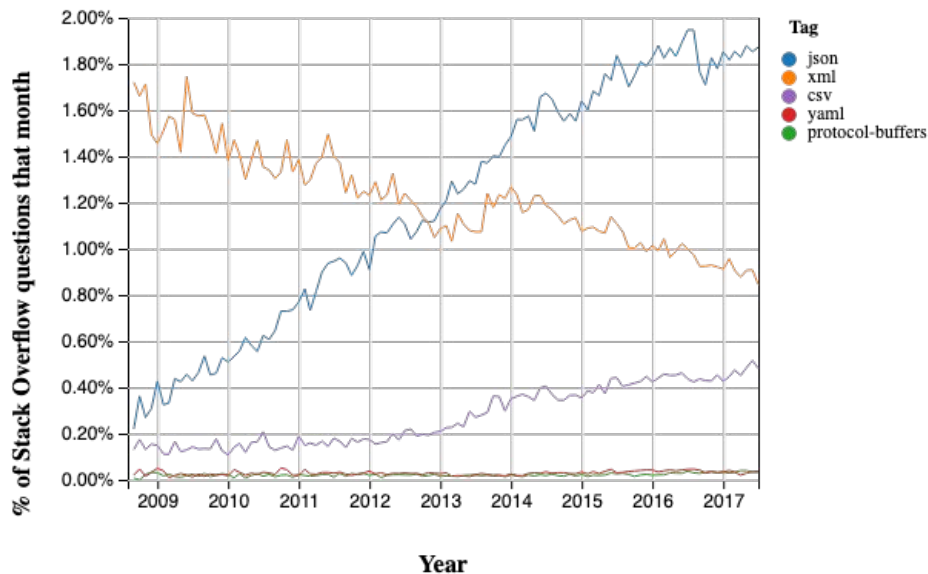
*Since a new object is created every time the function `printableMessage` is assigned to a new variable, `awesome1` is unaffected by `awesome2`...*

```
awesome1.printMessage();
```

# Data Formats - XML

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
  <age>25</age>
  <first_name>Joe</first_name>
  <last_name>Jones</last_name>
  <social_media>
    <network>facebook</network>
    <network>Twitter</network>
    <network>Instagram</network>
  </social_media>
  <online>true</online>
  <phone_numbers>
    <home>916-123-4567</home>
    <mobile>530-212-1111</mobile>
    <work>916-321-9876</work>
  </phone_numbers>
  <status>active</status>
</root>
```

XML remains a popular format for data, but has largely been surpassed by [JSON](#).



# JSON & Objects

```
var user = '{  
  "first_name": "Joe",  
  "last_name": "Jones",  
  "age": 25,  
  "social_media": [  
    "facebook",  
    "Twitter",  
    "Instagram"  
  ],  
  "online": true,  
  "phone_numbers": {  
    "home": "916-123-4567",  
    "work": "916-321-9876",  
    "mobile": "530-212-1111"  
  },  
  "status": "active"  
}';
```

```
var user = {  
  first_name: "Joe",  
  last_name: "Jones",  
  age: 25,  
  social_media: [  
    "facebook",  
    "Twitter",  
    "Instagram"  
  ],  
  online: true,  
  phone_numbers: {  
    home: "916-123-4567",  
    work: "916-321-9876",  
    mobile: "530-212-1111"  
  },  
  status: "active"  
};
```

# Example File

Open the example file and experiment with the data.

The first thing to do, is to convert the JSON string into an object:

```
var user = JSON.parse(json);
```

Then let's see what each of these variables have in them.

```
console.log(json);  
console.log(user);
```

```
<!doctype html>  
<html>  
<head>  
<meta charset="UTF-8">  
<title>JSON Data</title>  
</head>  
  
<body>  
  
  <h1>Working with JSON Data</h1>  
  
  <p>Usually JSON data will come from an external  
  source, such as a database, or an API  
  (Application Programming Interface), such as  
  Google Maps or from Twitter. In this file, we are  
  simply including the JSON directly.</p>  
  
  <script>  
  
    var json = '{ "first_name": "Joe",  
    "last_name": "Jones", "age": 25,  
    "social_media": [ "facebook", "Twitter",  
    "Instagram" ], "online": true,  
    "phone_numbers": { "home": "916-123-4567",  
    "work": "916-321-9876", "mobile": "530-212-  
    1111" }, "status": "active" }';  
  
  </script>  
  
</body>  
</html>
```

# Accessing Values

You can see that the `console.log` calls on the previous slide showed you the JSON string and the user object, respectively.

Now that you have an object, you can easily access values:

```
console.log(user.last_name);  
console.log(user.social_media[0]);  
console.log(user.phone_numbers.mobile);
```

You can change the values in the object:

```
user.first_name = "Bob";  
console.log(user);
```

You can delete values in the object

```
delete user.phone_numbers.home;  
console.log(user);
```

You can add values to the object

```
user.social_media[3]= "WordPress.com";  
console.log(user);
```

# Converting back to JSON

Once you have made all the changes to the user object, you can convert it back to a JSON string, if you want to send it out to some other service, or maybe a database.

```
var data = JSON.stringify(user);  
console.log(data);
```

This is just the beginning of working with objects and JSON. There is tons more to do, and to learn, but this gives you a solid foundation that you can build upon.