



_nology

TALENT IN **TECH**NICOLOUR

Looping over Complex Data

Learning Objectives

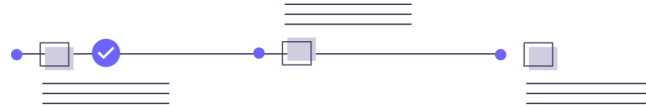
- Recap Arrays/Objects
- Complex/Primitive data types ?
- Object specific methods
- Looping over Arrays of Objects
- Nested Objects, Objects with Arrays
- Shallow vs Deep Copying and JSON

Overview

JSON

Deep/Shallow

Keys/Values



Primitive/Complex



Arrays of Arrays

Recap - What is an Array?

- Again... A way of storing/grouping data
- They are made up of values
 - Values can be..
 - Primitive
 - Complex (incl. Another Array)
 - Functions
- Zero indexed
- We access data in array by using the index... e.g. `coaches[0]`; `arrayName[index]`



Array Methods

- Arrays also have specific functions available in JS that we can use to perform common operations
- These include
 - `<Method>`
 - Adds item(s) onto the end of the array
 - `<Method>`
 - Removes item from end of array
 - `<Method>`
 - Removes first item from array
 - `<Method>`
 - Adds item(s) to start of the array

Recap - What is an Object?

- A way of storing/grouping data
- Key: value pairs
- Accessed via **"dot notation"**
- Objects Structure (right)
 - The Object is defined by the curly brackets ({})
 - name and age are "keys"
 - Andy and 30 are "values"
 - **person.name** will give us the string **Andy**
- A value can be...
 - A property
 - primitive data type
 - complex data type
 - A method
 - a function

```
const person = {  
  name: "Andy",  
  age: 30  
}  
  
// "Andy"  
person.name;  
  
// 30  
person.age;
```

Looping - Object Methods

Objects have specific functions available in JS that we can use to perform common operations

Object.keys

- returns an array of keys.

Object.values

- returns an array of values.

Object.entries

- returns an array of [key, value] pairs



Complex Data Types

- Arrays of Objects
- Nested Objects
- Two Dimensional Arrays
- Objects containing an array

```
{  
  fileName: "Inside",  
  rating: 6  
}
```

```
{  
  fileName: "Wall-e",  
  rating: 7.5  
}
```

```
{  
  fileName: "Up",  
  rating: 9  
}
```

Let's try this out

JSON

- JSON stands for **J**ava**S**cript **O**bject **N**otation
- JSON is a lightweight format for storing and transporting data
- JSON is often used when data is sent from a server to a web page
- JSON is "self-describing" and easy to understand



Code Along

Let's go shopping! We can explore **complex** data types

- Object Methods & Looping
- Objects containing Objects and Arrays
- Arrays of Objects
- Optional: Arrays of Arrays

Challenge #1

1. Using the Company Data (sent in slack).... Loop through the array and for each Object in the array create a div on the page with all the info.

Shallow vs Deep Copy

- Shallow
 - A new object is created that has an exact copy of the values in the original object.
 - If any of the fields of the object are references to other objects, just the reference addresses are copied i.e. only the memory address is copied.
- Deep
 - A deep copy copies all fields, and makes copies of dynamically allocated memory pointed to by the fields.
 - A deep copy occurs when an object is copied along with the objects to which it refers.



Final Point

- Primitive and Complex data types behave differently in relation to making shallow and /or deep copies...
 - So let's investigate that with some code....



Challenge #2

1. Navigate to the js-challenges repo
 - a. Complete js-8-complex-data-type
 - b. <https://github.com/nology-tech/js-challenges>