

JSON - JavaScript Object Notation

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Outline

- JSON syntax
- Reading JSON from a server
- JSON parsing
- JSON Objects and arrays

JSON - Introduction

- JSON is a syntax for storing and exchanging data
 - A lightweight data-interchange format
- Text is written with JavaScript object notation
- Can convert any JavaScript object into JSON, and thus send JSON to the server
- Similarly, JSON received from the server can be converted to JavaScript objects

JSON Syntax

- JSON syntax is derived from JavaScript object notation syntax
 - A subset of the JavaScript syntax
- Data is in key/value pairs
- Data is separated by commas
- {} – hold objects
- [] – hold arrays
 - E.g. { "name": "nks" }
 - Notice that in JavaScript, keys can be strings, numbers, or identifier names
 - Pure JavaScript object would be { **name**: "nks" }

JSON Values

Demo 1

- In JSON, values must be one of the following data types:
 - a string - { "name": "nks" }
 - an object (JSON object)
 - an array
 - a Boolean - { "sale": true }
 - null
- To access a object value use - book.title or book["title"]
- The file type for JSON files is ".json"
- The MIME type for JSON text is "application/json"
- JSON does not support comments

```
book = {  
  "title": "Core Servlets and JavaServer Pages",  
  "author": ["Marty Hall", "Larry Brown"],  
  "year": "2015",  
  "price": "50.25"  
};
```

JSON vs XML

Demo 2

- Both JSON and XML can be used to receive data from a web server
 - Both are self-describing and hierarchical
 - Both can be parsed and used by lots of programming languages
 - Both can be fetched with an “XMLHttpRequest”
- JSON is shorter and quicker to read and write
- XML is much more difficult to parse than JSON
- JSON is parsed into a ready-to-use JavaScript object

JSON – Reading from a server and parsing Demo 3

- JSON from the server can be requested by using an “AJAX” request
- JSON.parse() can be used to parse the JSON obtained from server to JavaScript object
 - If JSON is derived from an array, the method will return a JavaScript array

Reading JSON and parsing - continued

- There are some exceptions
- Date objects are not allowed in JSON
 - Write it as a string
 - `JSON.stringify()` function will convert any dates into strings
- Functions are also not allowed in JSON
 - `JSON.stringify()` function will remove any functions from a JavaScript object

JSON Objects

- To access a object value use - `book.title` or `book["title"]`
 - To modify - `book.year = "2016"`
 - To delete - `delete book.year`
- Loop through object properties and values by using the for-in loop

JSON Arrays

Demo 4

- We can access the array values by using the index number
 - E.g. `book.author[0]`
- You can access array values by using a **for-in** loop

```
var authors = "Authors of the book " + book["title"] + " are<br>";

for (i in book.author) {
    authors += book.author[i] + "<br>";
}
document.getElementById("demo").innerHTML = authors;
```

- You can modify and delete array values as well

References

- JSON Introduction
https://www.w3schools.com/js/js_json_intro.asp