JSON (1)

- JSON is a text based file format used to send information over the internet (i.e. between a web server and a client)
- derived from JavaScript but is now completely independant of it
    - can use JSON with **many** different programming languages
- supports numbers, booleans, strings, null, arrays (ordered sequences of vales), and objects
- Does **not support** functions, regex etc
- JSON **cannot** be called or constructed

JSON Basics

Strings in JSON

- always encased in double quotes

```
{"name":"Tom"}
```

Numbers in JSON

- No quotation marks

```
{"age":20}
```

JSON Objects

- Starts and ends with curly brackets, it contains key: value pairs.
- A key should contain a string e.g. “age”, whilst a value can be of the 6 data types: Strings, Integers, Arrays, Objects, boolean, null

-

```
{"student":{"name":"Tom", "age":30} }
```

- You can use the `.` notation to access a value
- JSON cannot contain functions, however JS Objects can contain functions - this is a key difference between JSON and JavaScript

Example:

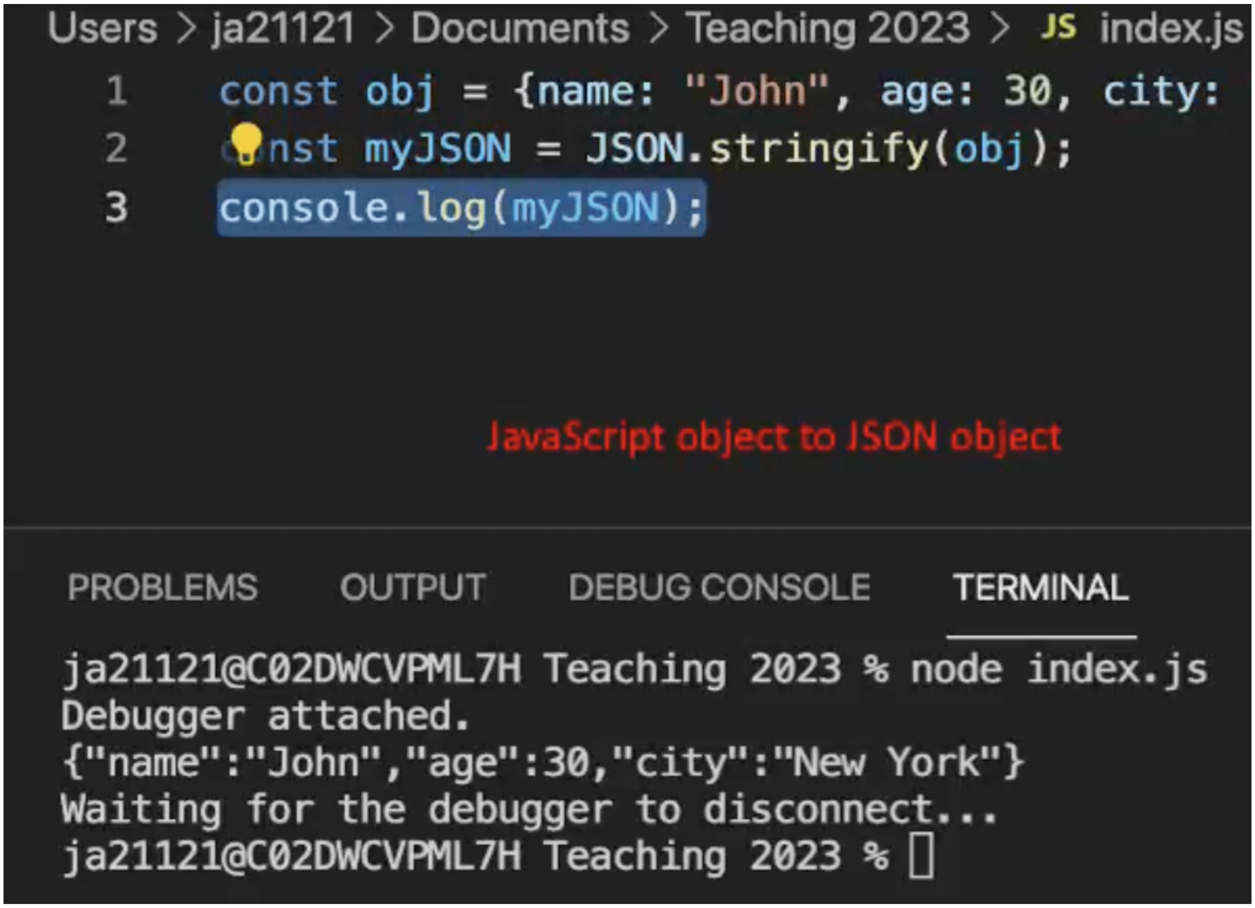
```
const data = {
"name": "CyberJoe",
"hobby": "piano",
"Language": ["Urdu", "English", "Punjabi"],
}

// accessing JSON objects:
console.log(data.name); // output = CyberJoe
console.log(data.hobby); // output = piano
console.log(data.Language[0]); // outout = Urdu
```

Converting to and from JavaScript Objects

`JSON.stringify` - this will convert a JavaScript Object to a JSON Object

Example:

- The name, age and city are not in double quotes as is required by JSON, so to convert this to a JSON file we use .stringify();



```javascript
const obj = {name: "John", age: 30, city:
const myJSON = JSON.stringify(obj);
console.log(myJSON);
```

JavaScript object to JSON object

```
ja21121@C02DWCVPML7H Teaching 2023 % node index.js
Debugger attached.
{"name":"John","age":30,"city":"New York"}
Waiting for the debugger to disconnect...
ja21121@C02DWCVPML7H Teaching 2023 % 
```

- The opposite of this is :

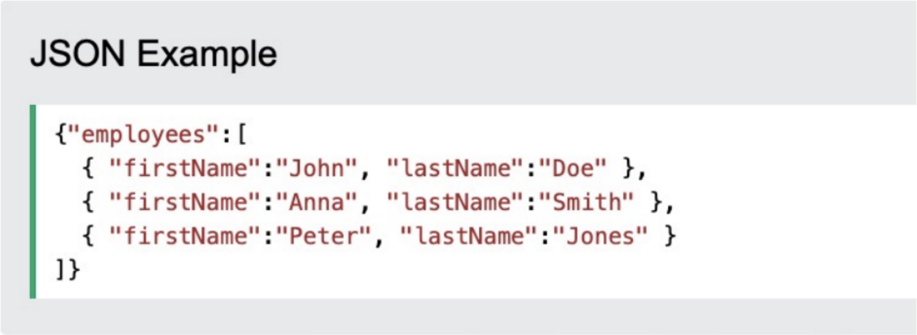
`JSON.parse` - this converts a JSON Object to a JavaScript Object

JSON v XML

why use JSON over XML?

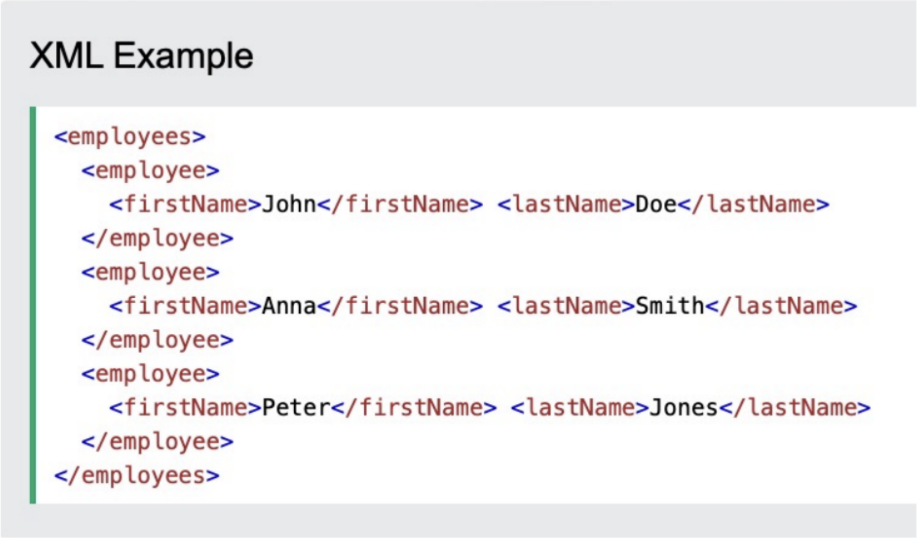
- JSON is easier to read and parse
- JSON can use arrays whereas XML **cannot**

Example:



JSON Example

```
{"employees":[
  { "firstName":"John", "lastName":"Doe" },
  { "firstName":"Anna", "lastName":"Smith" },
  { "firstName":"Peter", "lastName":"Jones" }
]}
```



XML Example

```
<employees>
  <employee>
    <firstName>John</firstName> <lastName>Doe</lastName>
  </employee>
  <employee>
    <firstName>Anna</firstName> <lastName>Smith</lastName>
  </employee>
  <employee>
    <firstName>Peter</firstName> <lastName>Jones</lastName>
  </employee>
</employees>
```