Array

Array

Arrays store multiple values in a single variable.

```
let fruits = ["Apple", "Banana", "Orange"];
```

Array Methods

```
let numbers = [10, 20, 30, 40];


numbers.push(50);   // Adds 50 to the end
numbers.unshift(5); // Adds 5 to the beginning


numbers.pop();   // Removes last element
numbers.shift(); // Removes first element


console.log(numbers.indexOf(20)); // Finding elements - Output: 1


let subArray = numbers.slice(1, 3); // Slicing an array
console.log(subArray); // Output: [20, 30]


let filteredNumbers = numbers.filter(num => num > 20); // Filtering an array
console.log(filteredNumbers); // Output: [30, 40]
```

JSON

JSON
(JavaScript Object Notation)

JSON is a format used for data exchange between servers and clients.

```
{
    "name": "John Doe",
    "email": "john@example.com"
}
```

Benefits of the JSON:

- **Lightweight and Efficient**: Its minimal syntax reduces data size, which can speed up data transmission over networks.

- **Easy to Parse and Generate**: Most programming languages have built-in libraries or functions to work with JSON, simplifying data processing.

- **Language-Independent**: Although it originated from JavaScript, JSON's structure is widely supported across many programming environments.

- **Ideal for Web Applications**: Its compatibility with JavaScript makes it especially useful for asynchronous web requests (AJAX), facilitating smooth client-server interactions.

Converting **JSON to JavaScript Object**

Converts JSON string to JavaScript object.
`JSON.parse(jsonData)`

```
let jsonData = '{"name": "Alice", "age": 25}';
let user = JSON.parse(jsonData);
console.log(user.name); // Output: Alice
```

Converting **JavaScript Object to JSON**

Converts JavaScript object to JSON format.
`JSON.stringify(object)`

```
let person = { name: "Bob", age: 40 };
let jsonString = JSON.stringify(person);
console.log(jsonString);
```

jQuery

jQuery

jQuery is a lightweight JavaScript library that simplifies DOM manipulation, event handling, and animations.
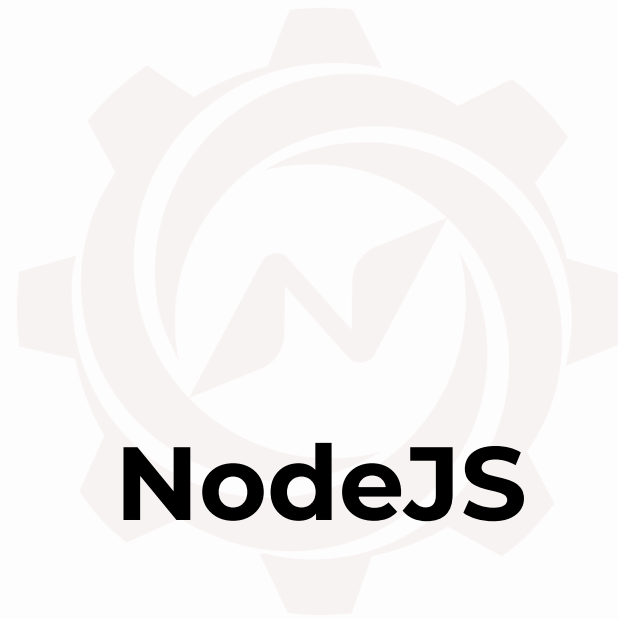
Why Use jQuery?

- Makes it easier to select and manipulate HTML elements.
- Simplifies AJAX calls and animations.
- Provides cross-browser compatibility.

Adding jQuery to a Project

```
<script src="https://code.jquery.com/jquery-3.6.0.min.js"></script>
```

Basic jQuery Syntax

```
$(document).ready(function() {
    $("#btn").click(function() {
        $("#text").hide();
    });
});
```

NodeJS

NodeJS

Node.js allows JavaScript to run outside the browser (server-side)

Download and install from nodejs.org

1. Create a file app.js:
```
console.log("Hello from Node.js");
```

2. Run it using:
```
node app.js
```

Creating a Simple HTTP Server

```
const http = require("http");

const server = http.createServer((req, res) => {
    res.writeHead(200, { "Content-Type": "text/plain" });
    res.end("Hello, World!");
});

server.listen(3000, () => console.log("Server running on port 3000"));
```

NPM

NPM

(Node Package Manager)

NPM is used to install JavaScript libraries and tools.

Checking NPM Version

```
npm –v
```

Initializing a Project - This creates a package.json file.

```
npm init –y
```

Installing Packages

Install Express (a web framework for Node.js)

```
npm install express
```

Using Installed Packages

```
const express = require("express");
const app = express();

app.get("/", (req, res) => {
    res.send("Hello from Express!");
});

app.listen(3000, () => console.log("Server running on port 3000"));
```

Run with:

```
node app.js
```

Referring Sources

- JavaScript: https://www.w3schools.com/js

- Arrays: https://www.w3schools.com/js/js_arrays.asp

- JSON: https://www.w3schools.com/whatis/whatis_json.asp

- jQuery: https://www.w3schools.com/jquery

- NodeJS: https://www.w3schools.com/nodejs

- NPM: https://www.w3schools.com/whatis/whatis_npm.asp