JavaScript Tutorial: From Basics to Intermediate

## 1. Introduction to JavaScript

JavaScript is a lightweight, interpreted programming language used to make web pages interactive (e.g., dynamic content, animations, form validation).

- Works on the client-side (browser) or server-side (Node.js)

- Integrated with HTML & CSS to enhance functionality

Example Use Case:

<button onclick="alert('Hello, JavaScript!')">Click Me</button>

## 2. JavaScript Syntax & Basics

// Output

console.log("Hello, World!");

// Variables

let name = "John";

const age = 30;

var city = "New York";

## 3. Data Types

| Type | Example |

|------------|---------------------|

| String | "Hello" |

| Number | 123, 3.14 |

| Boolean | true, false |

| Null | null |

| Undefined | let x; |

| Object | {name: "John"} |

| Array | ["red", "green"] |

Example:

let person = {

name: "Alice",

age: 25

};

console.log(person.name);

## 4. Operators

- Arithmetic: +, -, \*, /, %

- Comparison: ==, !=, ===, >, <, >=, <=

- Logical: &&, ||, !

- Assignment: =, +=, -=

## 5. Conditional Statements

let age = 20;

if (age >= 18) {

console.log("Adult");

} else {

console.log("Minor");

}

// Ternary

let result = (age >= 18) ? "Adult" : "Minor";

## 6. Loops

// For loop

for (let i = 0; i < 5; i++) {

console.log(i);

}

// While loop

let i = 0;

while (i < 5) {

console.log(i);

i++;

}

## 7. Functions

function greet(name) {

return "Hello, " + name;

}

console.log(greet("John"));

// Arrow Function

const greet = (name) => "Hello, " + name;

## 8. Arrays

let colors = ["red", "green", "blue"];

console.log(colors[1]); // "green"

colors.push("yellow");

colors.pop();

## 9. Objects

let car = {

brand: "Toyota",

model: "Camry",

year: 2022

};

console.log(car.model);

## 10. DOM Manipulation

HTML:

<p id="demo">Original Text</p>

<button onclick="changeText()">Change Text</button>

JS:

function changeText() {

document.getElementById("demo").innerHTML = "Text Changed!";

}

## 11. Events

HTML:

<button onclick="alert('Clicked!')">Click Me</button>

JS:

document.getElementById("btn").addEventListener("click", () => {

alert("Button Clicked");

});

## 12. Form Validation

HTML:

<form onsubmit="return validateForm()">

<input type="text" id="name" />

<input type="submit" value="Submit" />

</form>

JS:

function validateForm() {

let x = document.getElementById("name").value;

if (x === "") {

alert("Name must be filled out");

return false;

}

}

## 13. Timers

setTimeout(() => {

alert("This shows after 2 seconds");

}, 2000);

let count = 0;

let timer = setInterval(() => {

console.log(count++);

if (count > 5) clearInterval(timer);

}, 1000);

## 14. JSON

let person = { name: "John", age: 30 };

let jsonStr = JSON.stringify(person); // Object to JSON

let jsonObj = JSON.parse(jsonStr); // JSON to Object

## 15. Modern ES6+ Features

- let/const

- Arrow functions

- Template literals: `Hello, ${name}`

- Destructuring: const { name, age } = person;

- Spread: let newArr = [...arr, 3, 4];

## Bonus: Project Ideas

| Project | Description |

|---------------|------------------------------|

| Calculator | Simple calculator UI |

| To-Do List | Add, mark, delete tasks |

| Form Validation | Check fields, email etc. |

| Image Slider | Rotate images automatically |

| Quiz App | Score tracking system |