BAB 4: JAVASCRIPT DASAR

4.1 Pengenalan JavaScript

A. Cara Menambahkan JavaScript

JavaScript dapat ditambahkan ke HTML dengan dua cara:

1. **Internal JavaScript**

```
<script>
    console.log("Hello World!");
</script>
```

2. **External JavaScript** Buat file `script.js`:

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

Hubungkan ke HTML:

```
<script src="script.js"></script>
```

B. Variables dan Data Types

```
// Variables
let nama = "John";          // String
const umur = 25;           // Number
var aktif = true;          // Boolean

// Modern way (ES6+)
let angka = 42;
const PI = 3.14;

// Data Types
let text = "Hello";                    // String
let count = 42;                        // Number
let isActive = true;                   // Boolean
let items = ["apel", "jeruk", "mangga"]; // Array
let person = {                         // Object
    name: "John",
    age: 25
};
let kosong = null;                     // Null
let tidakDiisi;                        // Undefined
```

C. Operators

```
// Arithmetic Operators
let a = 10;
let b = 5;
console.log(a + b);  // Addition: 15
console.log(a - b);  // Subtraction: 5
console.log(a * b);  // Multiplication: 50
console.log(a / b);  // Division: 2
console.log(a % b);  // Modulus: 0

// Comparison Operators
console.log(a > b);   // true
console.log(a < b);   // false
console.log(a >= b);  // true
console.log(a <= b);  // false
console.log(a === b); // false
console.log(a !== b); // true
```

Latihan 1: Dasar JavaScript

1. Buat file HTML baru
2. Tambahkan internal dan external JavaScript
3. Praktikkan penggunaan variables dan operators

4.2 Control Structures

A. Conditional Statements

```
// If Statement
let nilai = 75;

if (nilai >= 80) {
    console.log("Nilai A");
} else if (nilai >= 70) {
    console.log("Nilai B");
} else {
    console.log("Nilai C");
}

// Switch Statement
let hari = "Senin";

switch(hari) {
    case "Senin":
        console.log("Hari kerja");
        break;
```

```
    case "Sabtu":
    case "Minggu":
        console.log("Hari libur");
        break;
    default:
        console.log("Hari tidak valid");
}
```

B. Loops

```
// For Loop
for (let i = 0; i < 5; i++) {
    console.log(`Iterasi ke-${i}`);
}

// While Loop
let count = 0;
while (count < 5) {
    console.log(count);
    count++;
}

// For...of Loop (Arrays)
let fruits = ["apel", "jeruk", "mangga"];
for (let fruit of fruits) {
    console.log(fruit);
}

// For...in Loop (Objects)
let person = {
    name: "John",
    age: 25,
    city: "Jakarta"
};
for (let key in person) {
    console.log(`${key}: ${person[key]}`);
}
```

Latihan 2: Control Structures

Buat program sederhana:

1. Cek kategori nilai siswa
2. Hitung rata-rata array
3. Loop through object properties

4.3 Functions

A. Function Declaration

```
// Basic Function
function sayHello(name) {
    return `Hello, ${name}!`;
}

// Function with Default Parameters
function greet(name = "Guest") {
    return `Welcome, ${name}!`;
}

// Arrow Function (ES6)
const add = (a, b) => a + b;

// Function Expression
const multiply = function(a, b) {
    return a * b;
};
```

B. Array Methods

```
let numbers = [1, 2, 3, 4, 5];

// forEach
numbers.forEach(num => console.log(num));

// map
let doubled = numbers.map(num => num * 2);

// filter
let evenNumbers = numbers.filter(num => num % 2 === 0);

// reduce
let sum = numbers.reduce((acc, curr) => acc + curr, 0);

// find
let firstEven = numbers.find(num => num % 2 === 0);
```

Latihan 3: Functions

Buat functions untuk:

1. Menghitung luas dan keliling
2. Filter array berdasarkan kriteria
3. Transform data array

4.4 DOM Manipulation

A. DOM Selectors

```
// By ID
const element = document.getElementById("myId");

// By Class
const elements = document.getElementsByClassName("myClass");

// By Tag
const paragraphs = document.getElementsByTagName("p");

// Query Selector
const firstElement = document.querySelector(".myClass");
const allElements = document.querySelectorAll(".myClass");
```

B. DOM Events

```
// Click Event
button.addEventListener("click", function() {
    console.log("Button clicked!");
});

// Form Submit
form.addEventListener("submit", function(event) {
    event.preventDefault();
    console.log("Form submitted!");
});

// Input Change
input.addEventListener("input", function(event) {
    console.log(event.target.value);
});
```

C. Modifying DOM

```
// Creating Elements
const newDiv = document.createElement("div");
newDiv.textContent = "New Content";
document.body.appendChild(newDiv);

// Modifying Elements
element.textContent = "New Text";
element.innerHTML = "<span>HTML Content</span>";
element.setAttribute("class", "newClass");
element.style.color = "red";

// Removing Elements
element.remove();
```

Latihan 4: DOM Practice

Buat aplikasi sederhana dengan:

1. Form input dengan validasi
2. Dynamic list dengan add/remove items
3. Toggle visibility elements

Tugas Akhir BAB 4

Buat aplikasi To-Do List dengan fitur:

1. Add new tasks
2. Mark tasks as complete
3. Delete tasks
4. Filter tasks (all/active/completed)
5. Save to localStorage

Tips JavaScript

1. Gunakan strict mode
2. Hindari global variables
3. Handle errors dengan try-catch
4. Gunakan modern ES6+ features
5. Perhatikan browser compatibility

Debug Tools

1. console.log()
2. debugger statement
3. Chrome DevTools
4. VS Code debugger

Referensi

- MDN JavaScript: https://developer.mozilla.org/en-US/docs/Web/JavaScript
- JavaScript.info: https://javascript.info/
- ES6 Features: https://es6-features.org/