Day 8: JavaScript Notes.

Logical Operators in JavaScript

Logical OR (||)

The **logical OR** operator returns true if **one or more** of its operands are true. If all operands are false, it returns false.

Examples:

```
console.log(4 > 7 || 6 == "6");  // true (because 6 == "6" is true)
console.log(4 > 7 || 6 == 7);    // false (both conditions are false)
```

Additionally, the OR operator returns the **first truthy value** it encounters when used in expressions, or the **last value** if all are falsy.

```
console.log(0 || null || "Hello" || undefined);  // "Hello"
console.log(0 || null || "" || undefined);       // undefined
```

Logical AND (&&)

The **logical AND** operator returns true **only if all** its operands are true. If any operand is false, the entire expression is false.

Examples:

```
console.log(10 > 5 && 8 < 12);  // true (both true)
console.log(10 > 5 && 8 == 12); // false (second condition false)
```

When used in expressions, AND returns the **first falsy value** it encounters or the **last value** if all are truthy:

```
console.log(5 && "Hi" && 0 && true);  // 0 (first falsy)
console.log(5 && "Hi" && 1 && true);  // true (all truthy)
```

Logical NOT (!)

The **logical NOT** operator converts a value to boolean and then **inverts** it:

```
console.log(!true);  // false
console.log(!0);     // true (because 0 is falsy)
```

Loops in JavaScript

Loops allow you to **repeat a block of code** multiple times as long as a given condition is true. They help automate repetitive tasks, saving you from writing duplicate code.

JavaScript offers several types of loops:

- **while loop**
- **do...while loop**
- **for loop**

While Loop

The while loop executes its block repeatedly **while the condition remains true**.

Example:

```
let i = 3;
while (i > 0) {
  console.log(i);
  i--;
}
```

// Output: 3, 2, 1

Do...while Loop

The do...while loop executes its block **at least once** before checking the condition.

Example:

```
let num = 0;
do {
  console.log(num);
  num++;
} while (num < 3);
```

// Output: 0, 1, 2

For Loop

The for loop combines **initialization**, **condition**, and **increment/decrement** in one line, making it concise for looping a known number of times.

Example:

```
for (let i = 0; i <= 3; i++) {
  console.log(i);
}
```

// Output: 0, 1, 2, 3
