JavaScript Notes on Logical Operators

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◆ What are Logical Operators?

Logical operators are used to **combine** or **manipulate** multiple true/false (boolean) values in JavaScript. They return a boolean result — `true` or `false`.

They are essential when checking multiple conditions or controlling logic in your code (we'll use them with `if` later on).

◆ The Three Logical Operators

1. **&&** (Logical AND)

- Combines two expressions.

- **Returns `true` only when both sides are true**.

- Otherwise, it returns `false`.

✅ **Example:**

```
console.log(true && true);   // true
console.log(true && false);  // false
console.log(false && true);  // false
console.log(false && false); // false
```

2. **||** (Logical OR)

- Combines two expressions.

- **Returns `true`** when **at least one side is true**.

- Returns `false` only if **both are false**.

✅ **Example:**

```
console.log(true || true);     // true
console.log(true || false);    // true
console.log(false || true);    // true
console.log(false || false);   // false
```

3. `!` (Logical NOT)

- Reverses the value.

- If it's `true`, it becomes `false`, and vice versa.

✅ **Example:**

```
console.log(!true);    // false
console.log(!false);   // true
```

Practical Use with Console

Let's try some real-world expressions — just using logical operators and `console.log`.

🎓 Example 1: Are both students present?

```
let pramodPresent = true;
let anjaliPresent = true;

console.log("Are both present?", pramodPresent && anjaliPresent);
// Output: true
```

🎓 Example 2: Is anyone present?

```
let amitPresent = false;
let riaPresent = true;

console.log("Is anyone present?", amitPresent || riaPresent);
// Output: true
```

🎓 **Example 3: Not attending?**

```
let studentOnline = false;

console.log("Is student not online?", !studentOnline);
// Output: true
```

Truth Table for Quick Reference

A	B	A && B	A ||B	!A
true	true	true	true	false
true	false	false	true	false
false	true	false	true	true
false	false	false	false	true

💡 Pro Tips by Pramod Sir

- Logical operators don't need `if` to work. You can test conditions directly with `console.log`.

- Practice combining `true` and `false` with `&&`, `||`, and `!` to build strong fundamentals.

- These operators will help control **flow of logic** in real-world programs.