TypeScript Basics for Automation Testers – Day 5

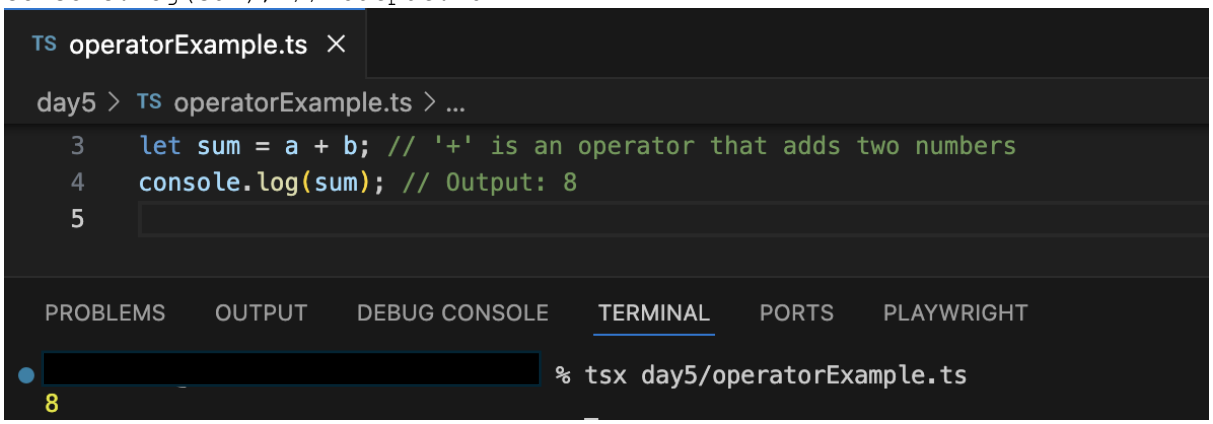
Topic: *Operators in TypeScript (Part 1 – Arithmetic, Assignment, and Relational Operators)*

What is an Operator?

The word **operator** means *someone or something that performs an operation or action*.
In programming, **operators** are **symbols used to perform operations on variables and values**.

Example:

```
let a: number = 5;
let b: number = 3;
let sum = a + b; // '+' is an operator that adds two numbers
console.log(sum); // Output: 8
```



Types of Operators in TypeScript

There are six main types of operators:

1. Arithmetic Operators
2. Assignment Operators
3. Relational (Comparison) Operators
4. Logical Operators
5. Increment and Decrement Operators
6. Ternary (Conditional) Operator

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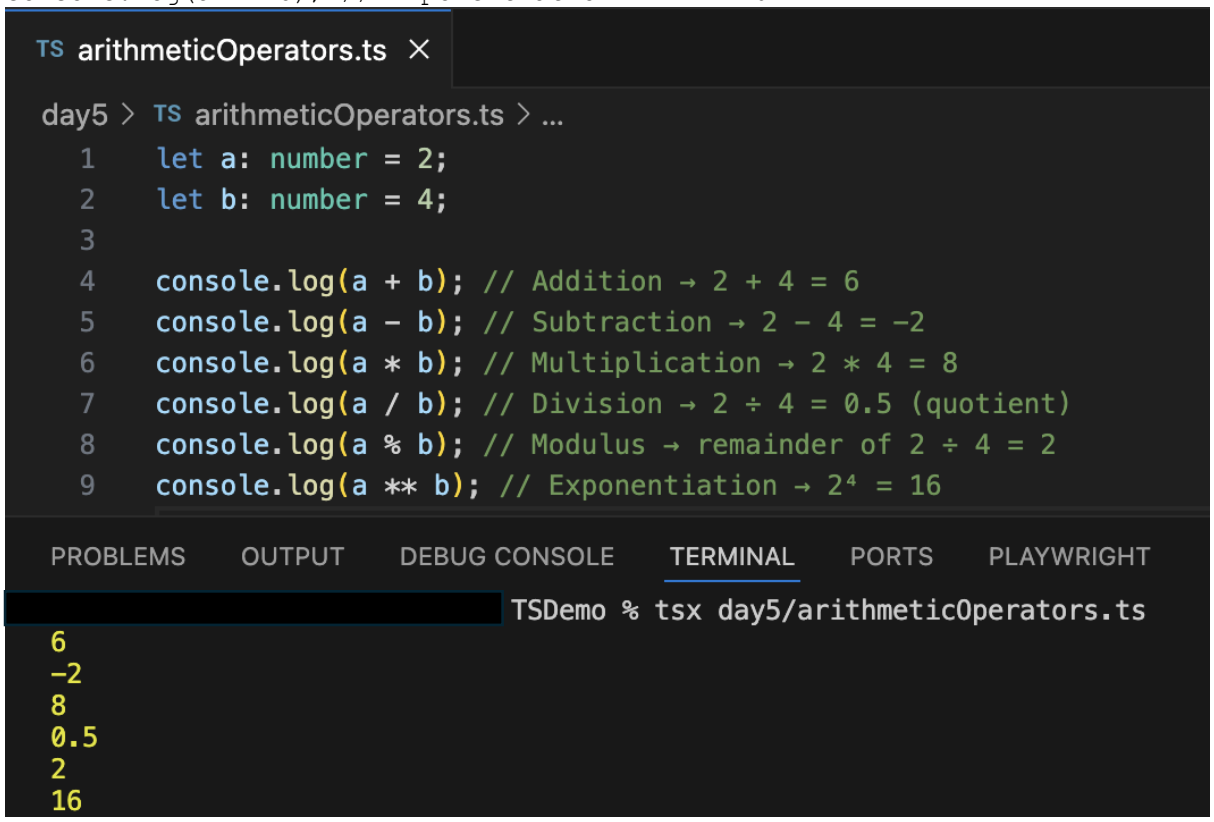
1. Arithmetic Operators

Meaning of "Arithmetic":
arithmetic means **the branch of mathematics dealing with numbers and basic operations like addition, subtraction, multiplication, and division.**

In TypeScript:
Arithmetic operators are used to perform basic mathematical operations.

```
let a: number = 2;
let b: number = 4;

console.log(a + b); // Addition → 2 + 4 = 6
console.log(a - b); // Subtraction → 2 - 4 = -2
console.log(a * b); // Multiplication → 2 * 4 = 8
console.log(a / b); // Division → 2 ÷ 4 = 0.5 (quotient)
console.log(a % b); // Modulus → remainder of 2 ÷ 4 = 2
console.log(a ** b); // Exponentiation → 2⁴ = 16
```



Note: Division vs Modulus

- **Division (/)** → gives **quotient** (how many times the number fits).
  Example: 10 / 3 = **3.33** → quotient = 3
- **Modulus (%)** → gives **remainder** after division.
  Example: 10 % 3 = **1** → remainder = 1

Tip:

Division = how many times it goes inside
Modulus = what's left over after division

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2. Assignment Operators

Meaning of "Assignment":
assign means **to give or allocate something to someone**.
In programming, **assignment operators** assign values to variables.

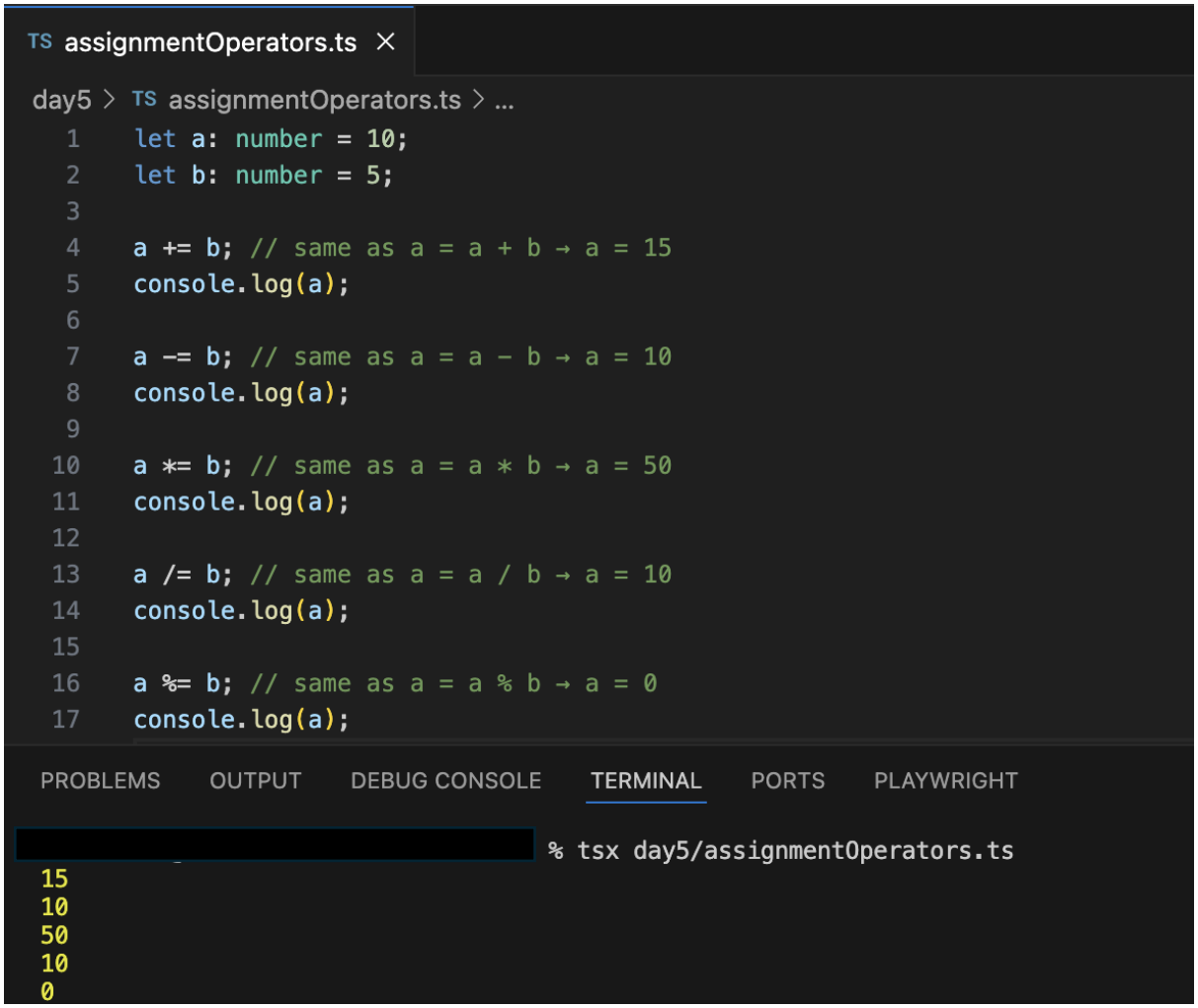
Basic assignment:

```
let a: number = 10;
let b: number = 5;
a = b; // assigns value of b to a
console.log(a); // Output: 5
```

Short-hand Assignment Operators

We can combine arithmetic and assignment together for simplicity. These are called **short-hand operators**.

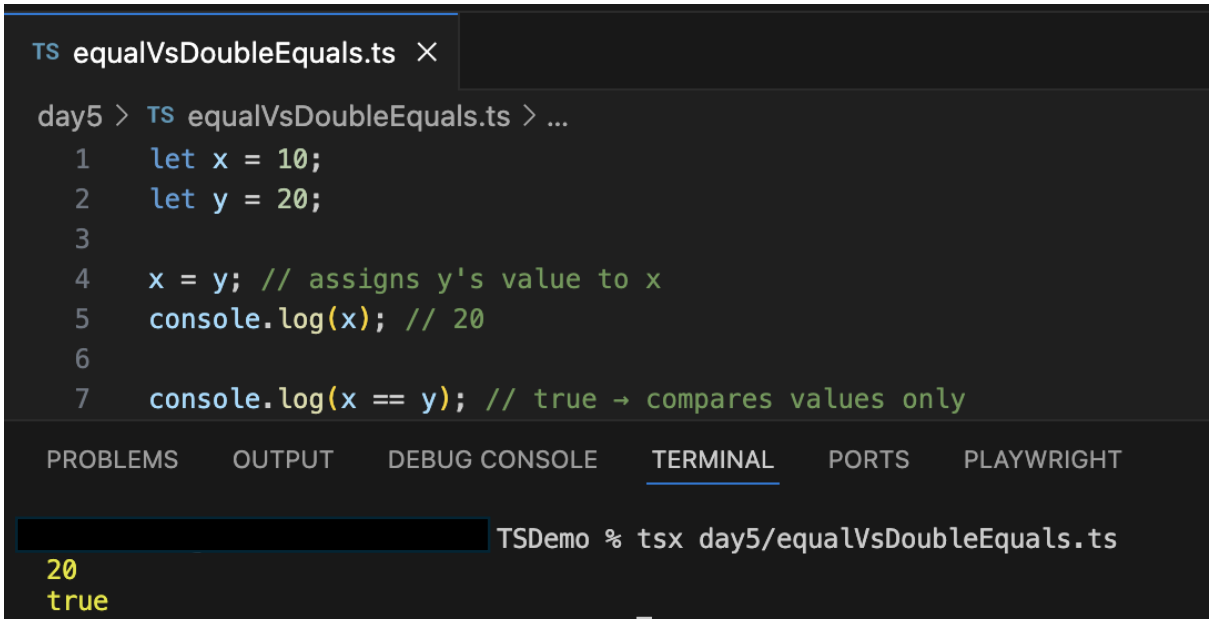
```
let a: number = 10;
let b: number = 5;

a += b; // same as a = a + b → a = 15
console.log(a);

a -= b; // same as a = a - b → a = 10
console.log(a);

a *= b; // same as a = a * b → a = 50
console.log(a);

a /= b; // same as a = a / b → a = 10
console.log(a);

a %= b; // same as a = a % b → a = 0
console.log(a);
```



Important Difference Between = and ==

- **= (Single Equal)** → *Assignment operator* (used to assign value)
- **== (Double Equal)** → *Comparison operator* (used to compare two values)

```
let x = 10;
let y = 20;

x = y; // assigns y's value to x
console.log(x); // 20

console.log(x == y); // true → compares values only
```



3.Relational or Comparison Operators

Meaning of "Relational":
The word *relational* means **showing or describing a connection or comparison between two things**.

In TypeScript:
These operators are used to **compare two values** and return a **Boolean result** (`true` or `false`).

Common Relational Operators

Operator	Description	Example	Result
>	Greater than	10 > 5	true
<	Less than	10 < 5	false
>=	Greater than or equal to	10 >= 10	true
<=	Less than or equal to	10 <= 5	false
==	Equality (compares only values)	10 == "10"	true
!=	Not equal to	10 != 5	true
===	Strict equality (compares value + type)	10 === "10"	false

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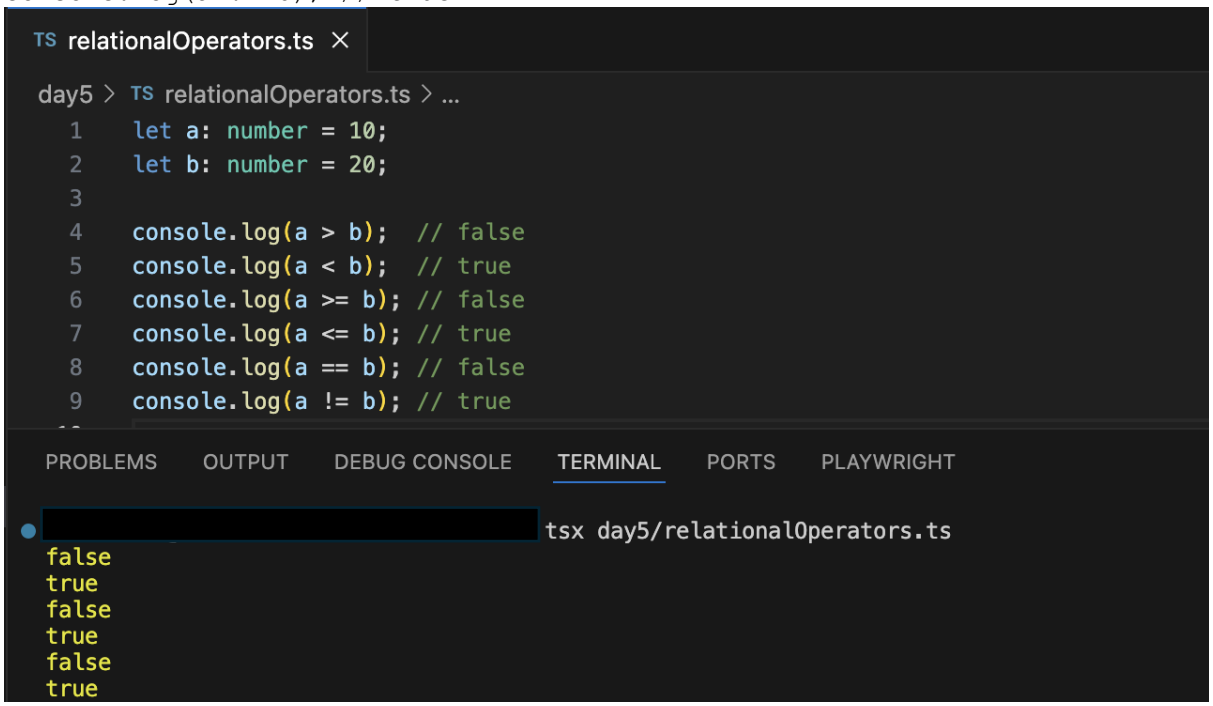
Example:

```
let a: number = 10;
let b: number = 20;

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



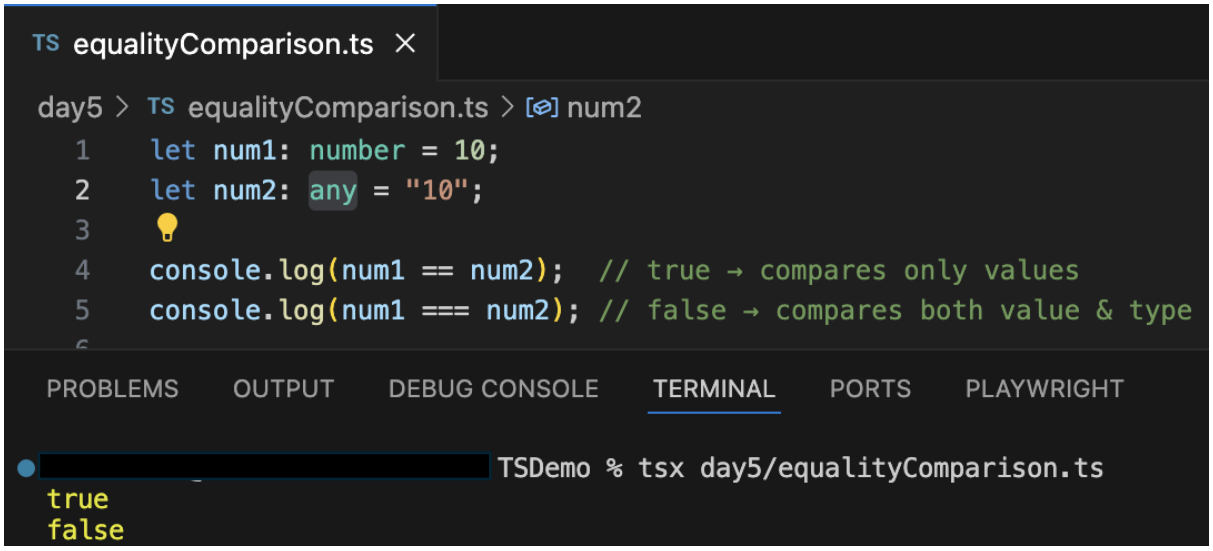
Double Equal (==) vs Triple Equal (===)

```
let num1: number = 10;
let num2: any = "10";

console.log(num1 == num2);  // true → compares only values
console.log(num1 === num2); // false → compares both value & type
```

Explanation:

- == checks only the **value**, not the **type**.
- === checks both **value and datatype** — hence safer and more reliable.



Questions

1. What is an operator in programming?
2. How many types of operators are there in TypeScript?
3. What is the difference between division (/) and modulus (%)?
4. Why are assignment operators called short-hand operators?
5. What is the main use of relational operators?
6. What is the difference between = and ==?
7. What is the difference between == and ===?
8. What kind of value do comparison operators return?

Answers

1. An operator is a symbol used to perform an operation (like +, -, =, >) on variables or values.
2. There are six types: Arithmetic, Assignment, Relational, Logical, Increment/Decrement, and Ternary.
3. Division (/) gives quotient; Modulus (%) gives remainder.
4. They are short-hand because they combine arithmetic and assignment in one step (e.g., `a += b`).
5. Relational operators compare two values and return `true` or `false`.
6. = assigns a value; == compares two values.
7. == checks only value; === checks both value and data type.
8. They always return a Boolean value — `true` or `false`.
