TypeScript Basics for Automation Testers – Day 5

Topic: Operators in TypeScript (Part 2 – Logical, Increment & Decrement, Ternary / Conditional Operators)

Difference Between Operators and Operands

Operator:
An **operator** is a symbol that tells the compiler or interpreter to perform a specific operation (like addition, subtraction, comparison, etc.).
It defines **what action** needs to be done.

Operand:
An **operand** is the **value or variable** on which the operator acts.
It defines **what is being operated on**.

Example:

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

- Here, `+` is the **operator** (it performs addition).
- `a` and `b` are **operands** (the values being added).
- The result `c` stores the outcome of the operation.

If `operator` is the **action**, then `operand` is the **object** of that action.
Like in "2 + 3",
`+` → operator
`2` and `3` → operands

Logical Operators

What is "logical"?

logical means dealing with true/false reasoning or combining conditions to get a boolean result.

How it is related here: Logical operators combine boolean expressions and return a boolean (`true` / `false`). Common logical operators: `&&` (AND), `||` (OR), `!` (NOT).

Truth behaviour (short):

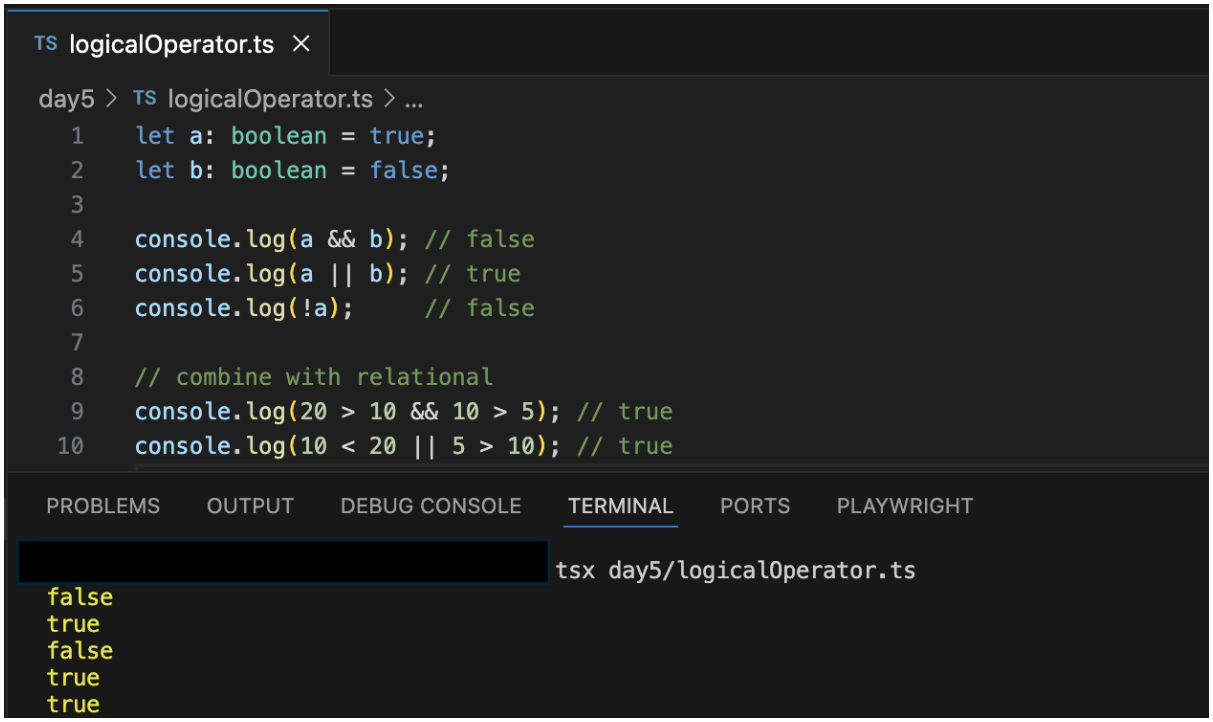
- `&&` → true only if both operands are true.
- `||` → true if any one operand is true.
- `!` → flips boolean value.

Example

```
let a: boolean = true;
let b: boolean = false;

console.log(a && b); // false
console.log(a || b); // true
console.log(!a);     // false

// combine with relational
console.log(20 > 10 && 10 > 5); // true
console.log(10 < 20 || 5 > 10); // true
```



Increment and Decrement Operators

What is it: Operators to increase (++) or decrease (--) a numeric value by one.

Post vs Pre behaviour:

- **Post-increment (`x++`)**: returns the old value, then increases the variable.
- **Pre-increment (`++x`)**: increases first, then returns the new value.
  Same for -- (decrement).

Example

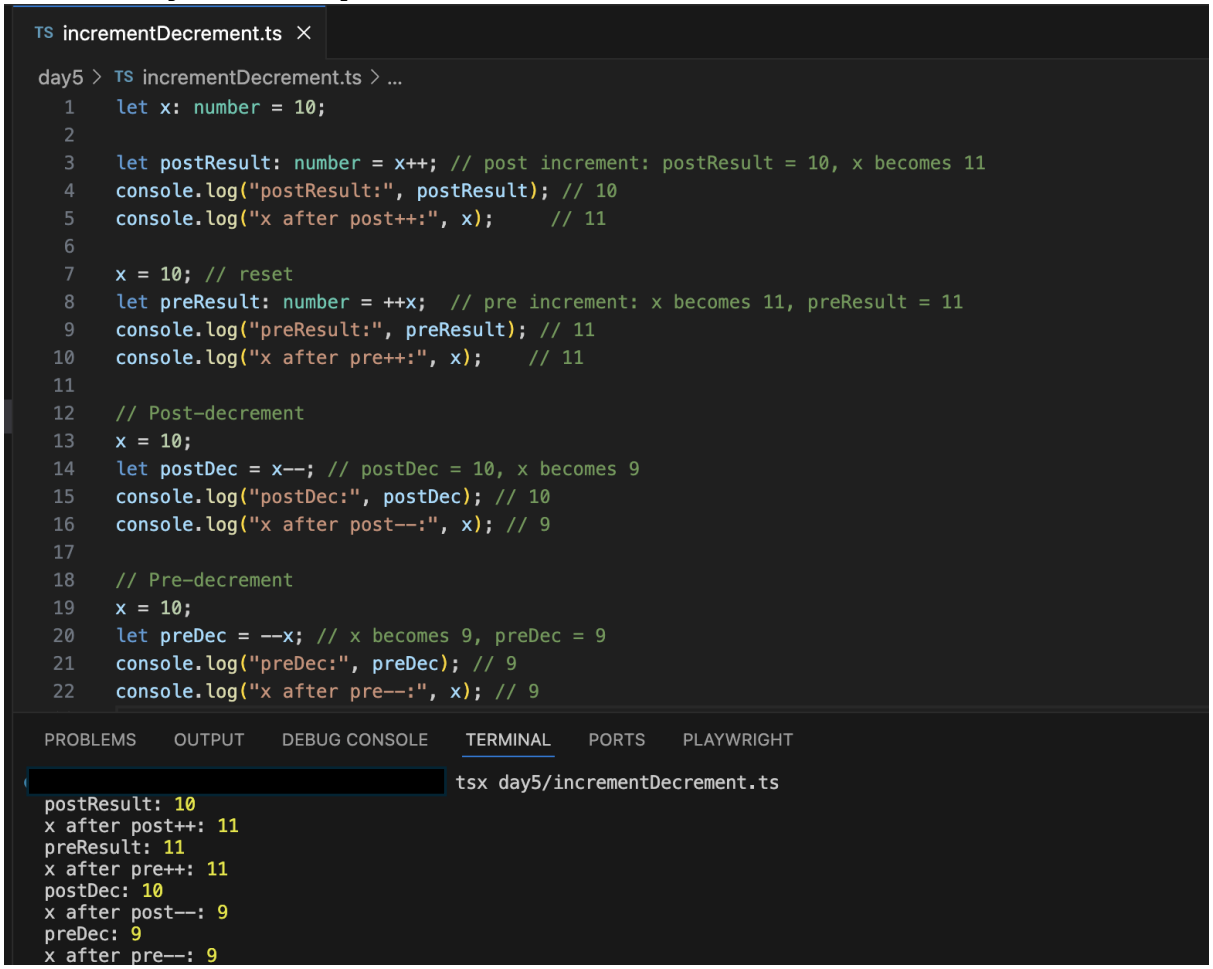
```
let x: number = 10;

let postResult: number = x++; // post increment: postResult = 10, x becomes
11
console.log("postResult:", postResult); // 10
console.log("x after post++:", x);      // 11

x = 10; // reset
let preResult: number = ++x;  // pre increment: x becomes 11, preResult =
11
console.log("preResult:", preResult); // 11
console.log("x after pre++:", x);     // 11

// Post-decrement
x = 10;
let postDec = x--; // postDec = 10, x becomes 9
console.log("postDec:", postDec); // 10
console.log("x after post--:", x); // 9

// Pre-decrement
x = 10;
let preDec = --x; // x becomes 9, preDec = 9
console.log("preDec:", preDec); // 9
console.log("x after pre--:", x); // 9
```



Ternary / Conditional Operator

What is it: A compact conditional expression that returns one of two values based on a boolean condition. It's the inline form of `if-else`.

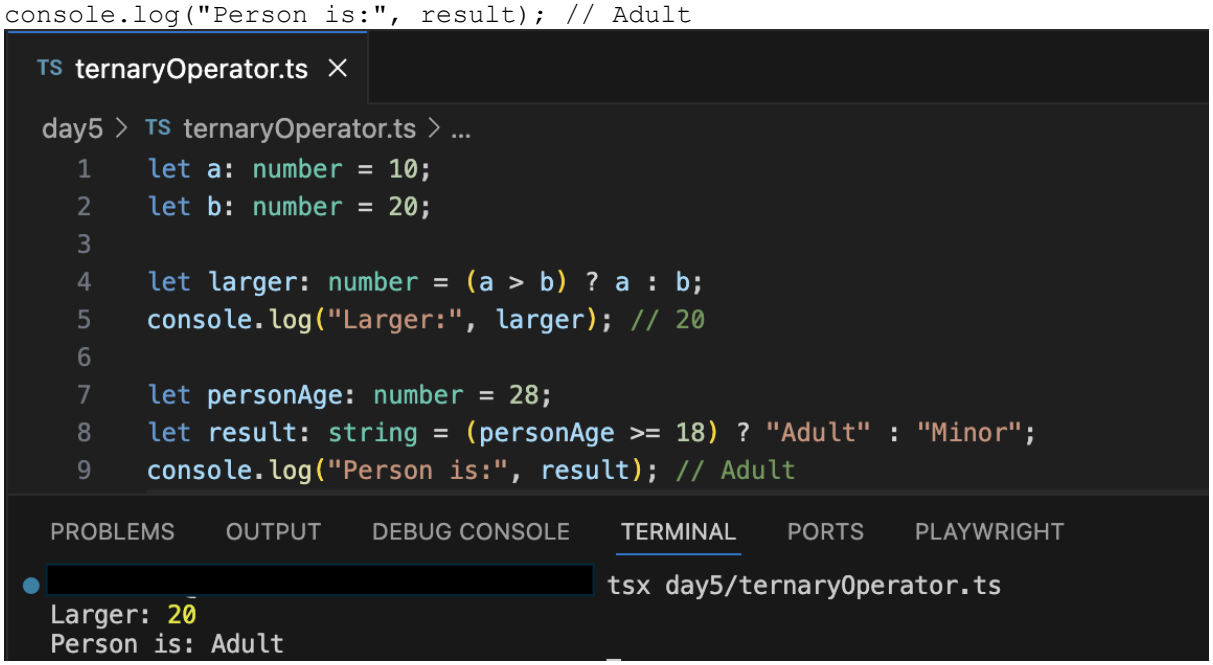
Syntax: `condition ? valueIfTrue : valueIfFalse`

Example

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

let larger: number = (a > b) ? a : b;
console.log("Larger:", larger); // 20

let personAge: number = 28;
let result: string = (personAge >= 18) ? "Adult" : "Minor";
console.log("Person is:", result); // Adult
```



Questions

1. What does a logical operator do?
2. Name the three logical operators and their basic behavior.
3. What value type do logical operators return?
4. What is the difference between post-increment (`x++`) and pre-increment (`++x`)?
5. What will `let r = x++ + ++x;` do conceptually?
6. What is the ternary operator and what is its basic syntax?
7. When would you prefer a ternary operator over `if-else`?
8. Which of the following returns true: `(true && false) || !false` ?

Answers

A1. A logical operator combines boolean expressions and returns a boolean result (`true` or `false`).

A2. `&&` (AND) — true if both operands are true.
`||` (OR) — true if at least one operand is true.
`!` (NOT) — inverts the boolean value.

A3. Logical operators return a **boolean** value (`true` or `false`).

A4. Post-increment (`x++`) returns the variable's current value then increments it. Pre-increment (`++x`) increments first, then returns the new value.

A5. `let r = x++ + ++x;` mixes post and pre increments: first `x++` yields old `x`, then `++x` increments and yields new `x`. The expression result depends on initial `x` and can be confusing — test it in code to see exact numeric result. (Practice to observe behavior.)

A6. The ternary operator is `condition ? valueIfTrue : valueIfFalse`.

A7. Use ternary for short simple conditional assignments when it improves readability; use `if-else` for multi-line or complex logic.

A8. Evaluate: `(true && false) || !false` → `(false) || true` → `true`. So the answer is **true**.
