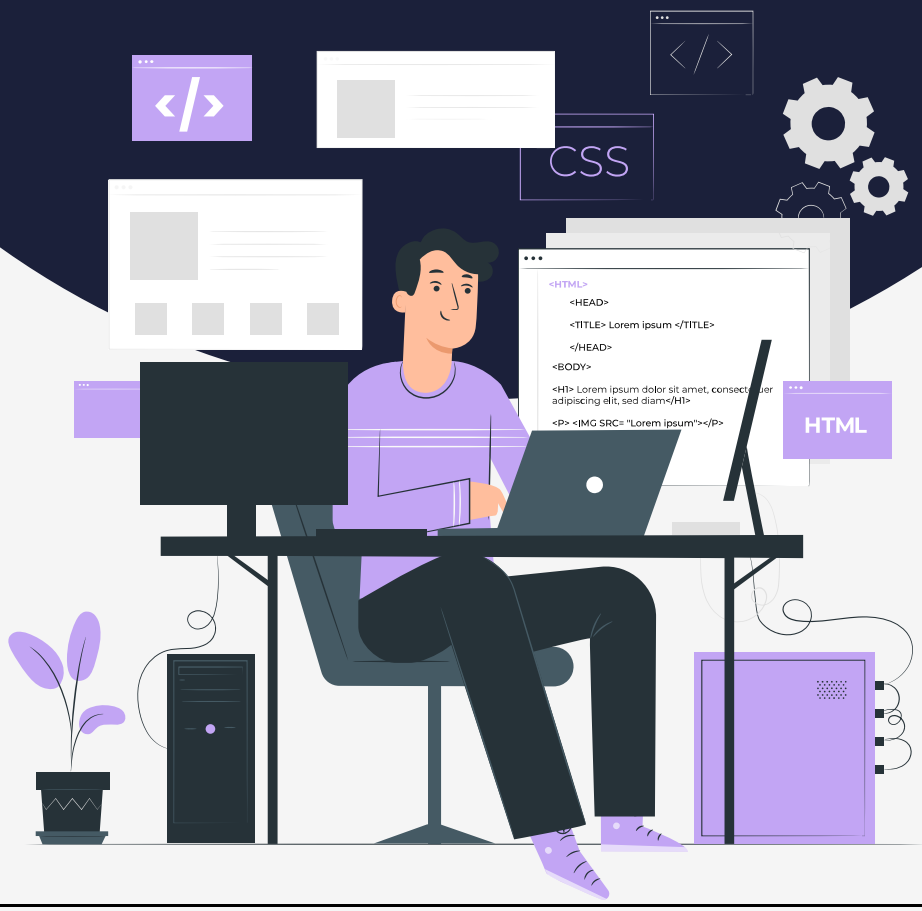
Lesson:

typeof and ternary operator



PW SKILLS

Topics Covered

1. Introduction to typeof Operator
2. typeOf Operator and type safety
3. Introduction to ternary operator.
4. Chaining using the Ternary operator

Introduction to typeof Operator

The typeof operator is a JavaScript operator that allows checking the data type of a given variable. It can be used with any data type, including objects, arrays, and even null values.

Example

```javascript
var name = "PW Skills";
var students = 12345678;
var enrolledToFSWD = true;
var couponCode = null;
var endDate;
var studentsEnrolled = NaN;

console.log(typeof name); // string
console.log(typeof students); // number
console.log(typeof enrolledToFSWD); // boolean
console.log(typeof couponCode); // object
console.log(typeof endDate); // undefined
console.log(typeof studentsEnrolled); // number
```

```javascript
var mentorDetails = {
  name: "Anurag",
  yearsOfExperience: 4,
};
var techStack = ["HTML", "CSS", "Javascript", "Node", "React",
"Express"];

console.log(typeof mentorDetails); // object
console.log(typeof techStack); // object
```

There are a few benefits to using the **typeof** operator in JavaScript.

It is a convenient way to check if a variable is of a certain data type without having to check for conditions.

Note: typeof array is “object”, because array derived from object data type, and typeof returns all values other than primitive data type as “object”.

typeOf Operator and type safety

Type safety means to refrain from doing the wrong operation on the wrong datatype.

We can implement some level of type safety, using the type of operator.

Example: Let's say we have a username variable called name.

```javascript
let name = "Subham";
```

Later on, we transformed the name to uppercase.

```javascript
name.toUpperCase() // "SUBHAM"
```

But suppose, if we mistakenly assigned a name as a number. It will throw an error, Uncaught TypeError

```javascript
let name = 23;
name.toUpperCase() // "VM40:2 Uncaught TypeError:
name.toUpperCase is not a function"
```

So, to tackle this problem, we can use the typeof operator in if condition, before performing the toUpperCase operation to check whether the name is a string or not. We will study more about conditional statements in later lessons.

```javascript
let name = 23;

if(typeof name === "string"){
  name.toUpperCase()
}else{
  console.log("Please provide a String")
}

// Output - Please provide a String
```

Type safety is a vast concept. We have a popular language called **typescript (JavaScript with Types)**, which handles type safety very wisely.

Introduction to Ternary Operator

So far we have seen operators are used to assign, compare, and evaluate one, two operands. Ternary operator is one of the special operators that have 3 operands and are often used as a shorthand for an if-else statement.

The majority of developers use the ternary operator because:

1. The ternary operator allows you to write simple if-else statements in a single line of code, **making your code more compact and readable.**
2. The ternary operator can make your code more expressive by allowing you to clearly express the intent of the code in a **single line.**
3. The ternary operator is simple to use and understand, making it a good choice for short and simple conditions.

The ternary operator is widely used in several libraries and frameworks such as React.js where it's **widely used**.

Syntax of Ternary Operator:
Let's look at the syntax compared with the if-else statement

```javascript
// if-else statement


if (condition) {
  expressionIfTrue;
} else {
  expressionIfFalse;
}
```

The if-else statement takes a condition that will be evaluated to be either true or false. The if-else statement above can be rewritten with ternary operators.

```javascript
// Ternary Operator

condition ? <expressionIfTrue> : <expressionIfFalse>
```

Example
Let's look at an example. Assume that you need to check if the person is logged in or not and provide the access to PW Skills lab

```javascript
var isTheUserLoggedIn = true;

// Using ternary operator

isTheUserLoggedIn
  ? console.log("PW Skills lab Access Granted !!")
  : console.log("PW Skills lab Access Denied !!");

OR

console.log(isTheUserLoggedIn


  ? "PW Skills lab Access Granted !!"
  : "PW Skills lab Access Denied !!");
```

Chaining Ternary operator
Like we have seen nested if-else statements in last lesson, we can do the same with ternary operator by chaining. **Chaining** refers to the practice of using multiple ternary operators in succession to create more complex conditional expressions.

Example
Let's assume in order to access the "Full Stack Web Developer Course", the user must be both logged in and should have purchased the course. Let's see how we can do this using the ternary operator.

Course purchase module: User can only purchase a course if he/she loggedIn

Case 1: User not loggedIn

```javascript
var isTheUserLoggedIn = false;

var isTheCoursePurchased = false;

isTheUserLoggedIn
  ? isTheCoursePurchased
    ? console.log("Access Granted")
    : console.log("Access Denied!! Please Buy The Course")
  : console.log("Access Denied!! Please Login");


// OUTPUT : Access Denied!! Please Login
```

Case 2: User loggedIn, but not purchased course

```javascript
var isTheUserLoggedIn = true;

var isTheCoursePurchased = false;

isTheUserLoggedIn
  ? isTheCoursePurchased
    ? console.log("Access Granted")
    : console.log("Access Denied!! Please Buy The Course")
  : console.log("Access Denied!! Please Login");

// OUTPUT : Access Denied!! Please Buy The Course
```

Case 3: User not loggedIn and purchased course

```javascript
var isTheUserLoggedIn = true;

var isTheCoursePurchased = true;

isTheUserLoggedIn
  ? isTheCoursePurchased
    ? console.log("Access Granted !!")
    : console.log("Access Denied!! Please Buy The Course")
  : console.log("Access Denied!! Please Login");

// OUTPUT : Access Granted !!
```

Using chaining in ternary operators is not advised because chaining multiple ternary operators can make the code more difficult to read and understand, especially if the expressions become complex. This can make it harder for other developers (including yourself in the future) to maintain and debug the code.