Report Day: 4.2

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Learning Outcomes:

Variables:

Variables in JavaScript are used to store data that can be referenced and manipulated throughout a program. The variable declaration keywords var, let, and const differ in scope, hoisting, and mutability.

Declaration in 4 ways:

- Automatically
- Using var
- Using let
- Using const

It is considered good programming practice to always declare variables before use.

The var keyword should only be used in code written for older browsers.

When to use:

- Always declare variables
- Always use const if the value should not be changed
- Always use const if the type should not be changed (Arrays and Objects)
- Only use let if you can't use const
- Only use var if you MUST support old browsers.

```html
<!DOCTYPE html>
<html>
<body>
<h1>JavaScript Variables</h1>

<p>In this example, x, y, and z are variables.</p>

<p id="demo"></p>

<script>
let x = 5;
let y = 6;
let z = x + y;
document.getElementById("demo").innerHTML =
"The value of z is: " + z;
</script>

</body>
</html>
```

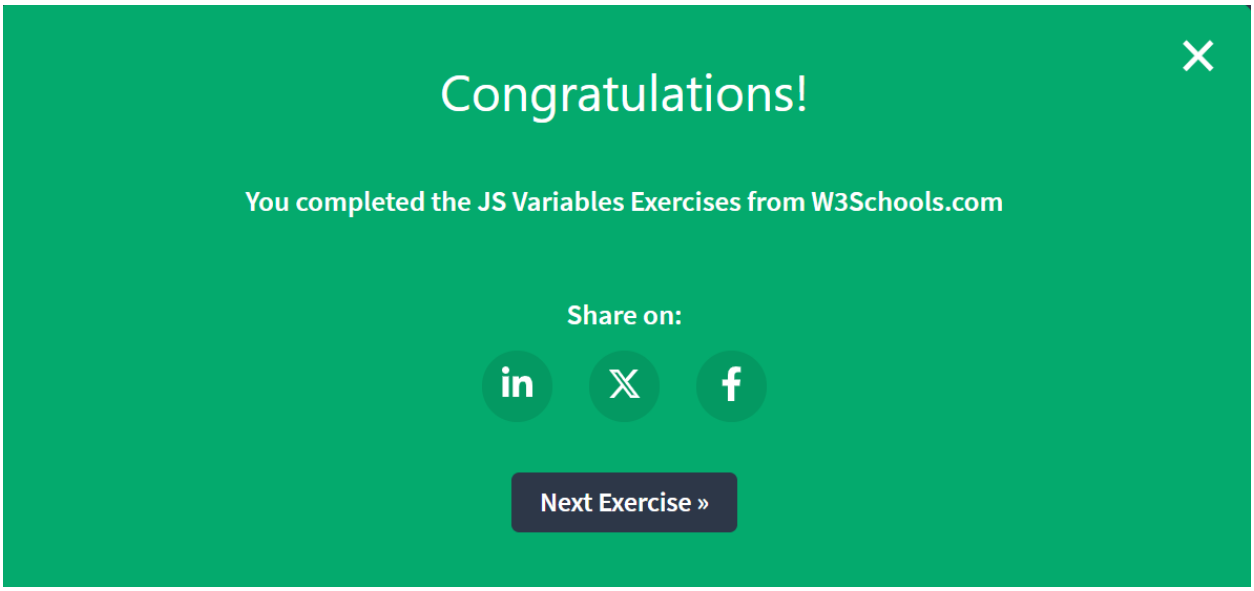
Identifiers:

All JavaScript **variables** must be **identified** with **unique names**.

These unique names are called **identifiers**.

A variable declared without a value will have the value undefined.

JavaScript treats underscore and $ as a letter.



Main Datatypes:

Number

- Represents both integer and floating-point numbers.
- Example: let x = 5;, let y = 3.14;

String

- Represents textual data.
- Defined using single quotes, double quotes, or backticks (for template literals).
- Example: let name = "Ayesha";

Boolean

- Logical values: true or false.
- Example: let isStudent = true;

Undefined

- A variable that has been declared but not assigned a value.
- Example: let a; console.log(a); // undefined

Null

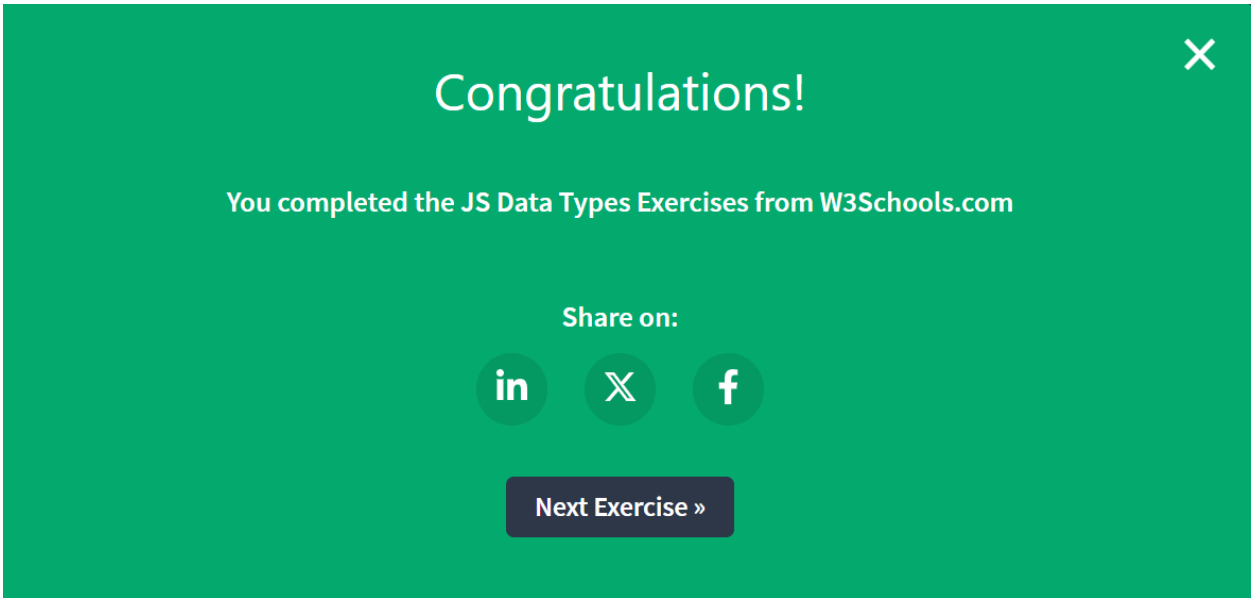
- Represents intentional absence of any object value.
- Example: let data = null;

Symbol (ES6)

- Represents unique and immutable values, primarily used as object keys.

BigInt (ES2020)

- Used to represent integers larger than the Number type can safely store.
- Example: let big = 1234567890123456789012345678901234567890n;



Conclusion:

JavaScript's variable declarations (var, let, and const) give developers different levels of scope control and mutability, making modern JS safer and more predictable than earlier versions. Alongside this, JavaScript's rich set of data types allows flexible and powerful data manipulation.