Compare and contrast JavaScript syntax with Python syntax

By Eric Obasi

Variable Declaration:

Variables are Containers for Storing Data

JavaScript:

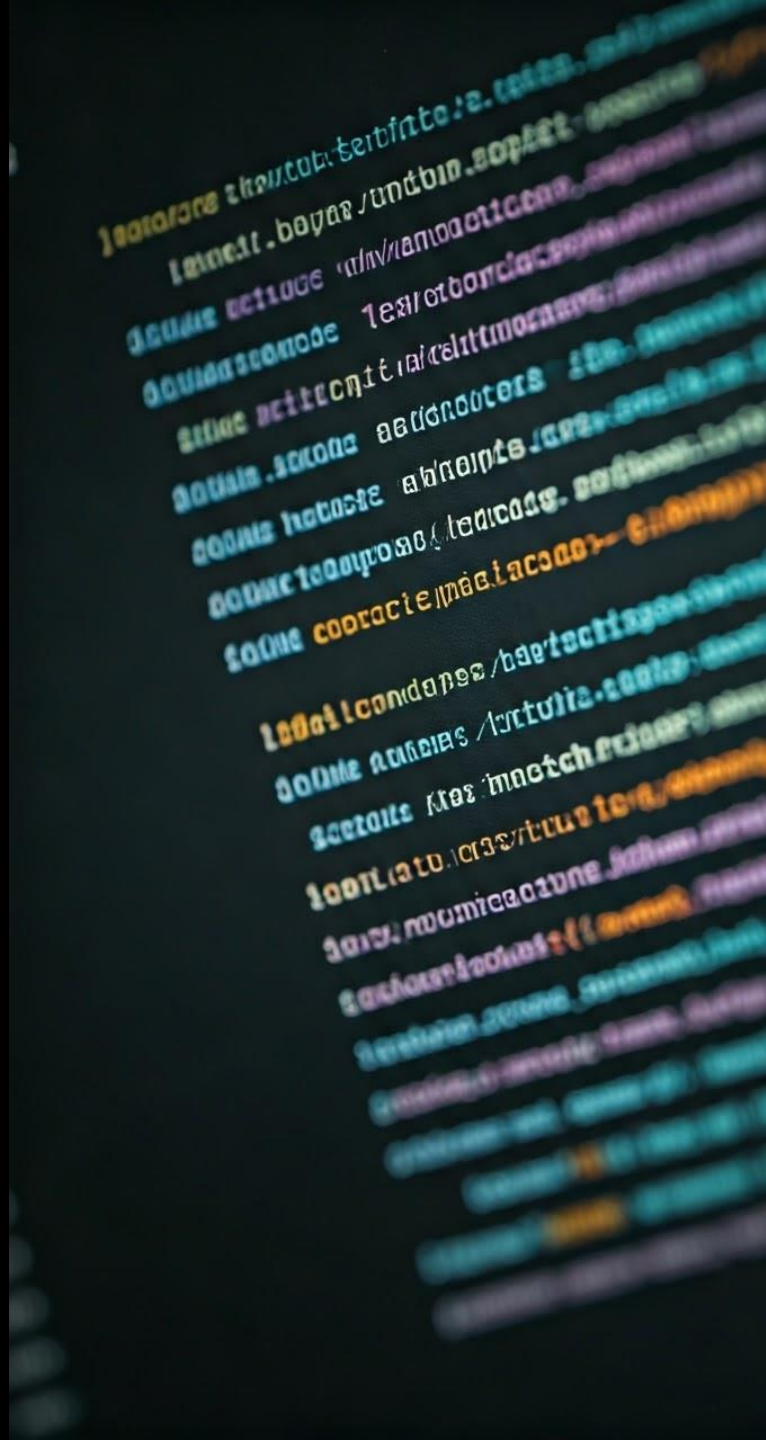
- let/const: Introduced to fix var’s hoisting/scoping issues. const ensures immutability (but only for the reference, not the value).

- Hoisting: var declarations are hoisted (moved to the top of the scope), which can be confusing.

```
let x = 10;          // Mutable

const y = 20;        // Immutable

var z = 30;          // Legacy (avoid)
```



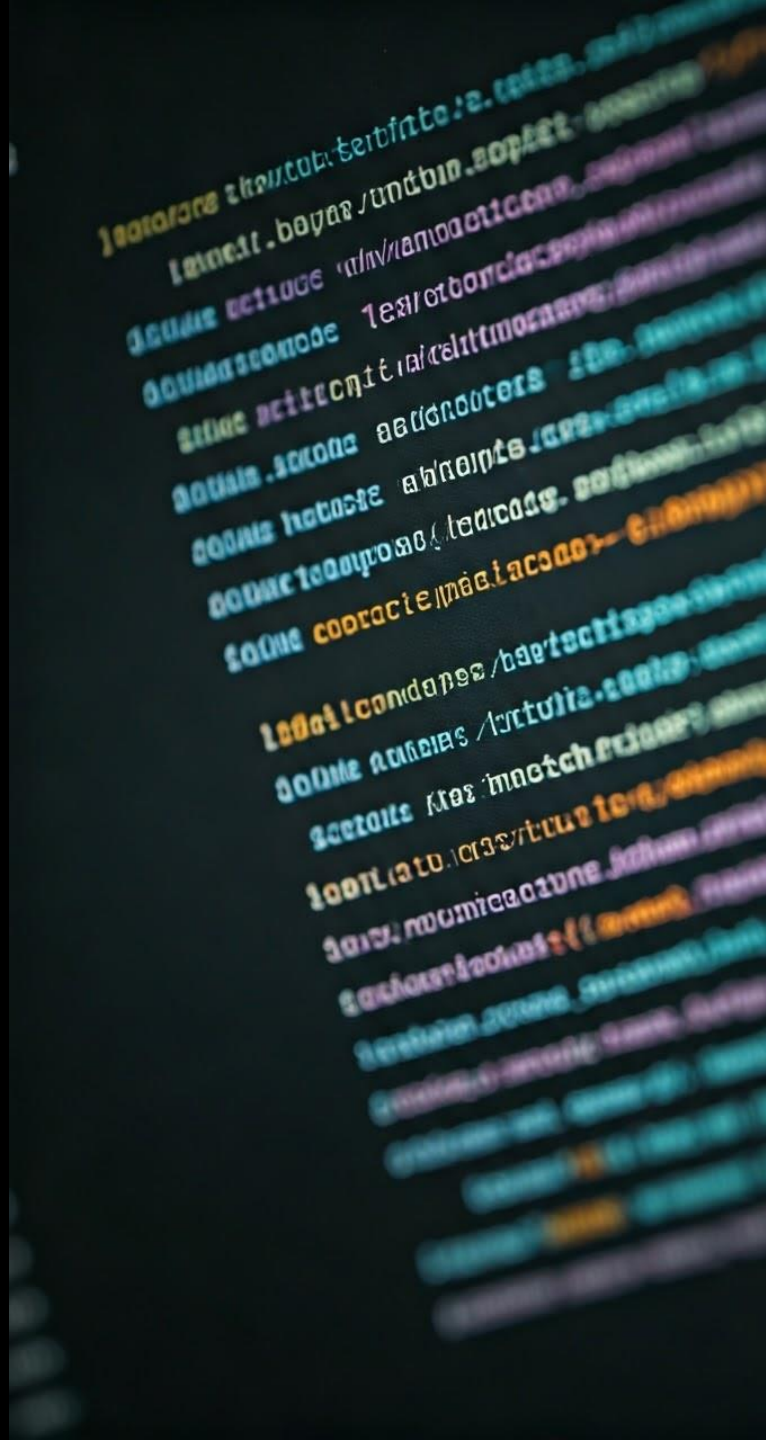
Python:

- No Keywords: Variables are created on assignment. Dynamic typing means a variable can change types freely.

- Scope Rules: Uses LEGB (Local → Enclosing → Global → Built-in) scope resolution.

```
x = 10          # Mutable

y = 20          # Mutable
```



Syntax Style

Syntax is the set of rules that defines the structure and format of valid code in a particular programming language. It dictates how symbols, keywords, and punctuation must be used for the code to be correctly understood and executed

JavaScript:

- curly braces: braces explicitly define scope, reducing ambiguity in minified code.
- Semicolons: Automatic Semicolon Insertion (ASI) can cause subtle bugs (e.g., return statements).

```
if (condition) {
  console.log("Hello");
}
```

Python:

- Indentation as syntax: Forces consistent readability but can cause errors if mixed tabs/spaces are used.
- Colons: Signals the start of a block.

if condition: print(“Hello”)

Functions

A function is a block of code which only runs when it is called. Data known as parameters, can be passed into a function and the function can return data as a result.

JavaScript: function is defined with the function keyword, followed by a name, followed by parentheses ().

-Function names can contain letters, digits, underscores, and dollar signs (same rules as variables).

- Functions can be passed as arguments, returned, or assigned.

```
function myFunction(p1, p2) {
  return p1 * p2;
}
```

Python: a function is defined using the def keyword

```
def my_function():

  print("Hello from a function")
```

Data type

Data type define the kind of data a variable can hold. They help the computer understand how to store and operate on that data.

Javascript: JavaScript has 8 Datatypes; String, Number, Bigint, Boolean, Undefined, Null, Symbol, Object

```
let x = 42;        // Number

let y = "text";    // String

let z = true;      // Boolean
```

const person = {firstName:“Eric", lastName:“Obasi"}; // Object

Python: python has the following data types

-Text Type: str

-Numeric Types: int, float, complex

-Sequence Types: list, tuple, range

-Mapping Type: dict

-Set Types: set, frozenset

-Boolean Type: bool

-Binary Types: bytes, bytearray, memoryview

-None Type: NoneType

```
x = "Hello World"     #str

x = 20                #int

x = 20.5    #float

X = true        #bool

x = ["apple", "banana", "cherry"]               #list
```

Similarities

-Both are dynamically typed. Both allow variables to change types

-Both are easy to read and write, closer to human language than low-level languages like C.

-Both can be used together: Python for server logic, JavaScript for front-end interaction.

-Both can loop through numbers or lists.

-Both use lists/arrays to hold multiple items.


Thank
you