Chapter 2: Variables & Datatypes

Q. What are variables? What is the difference between var, let, and const ?

Q. What are data types in JS?

Q. What is the difference between primitive and non-primitive data types?

Q. What is the difference between null and undefined in JS?

Q. What is the use of type of operator?

Q. What is type coercion in JS?

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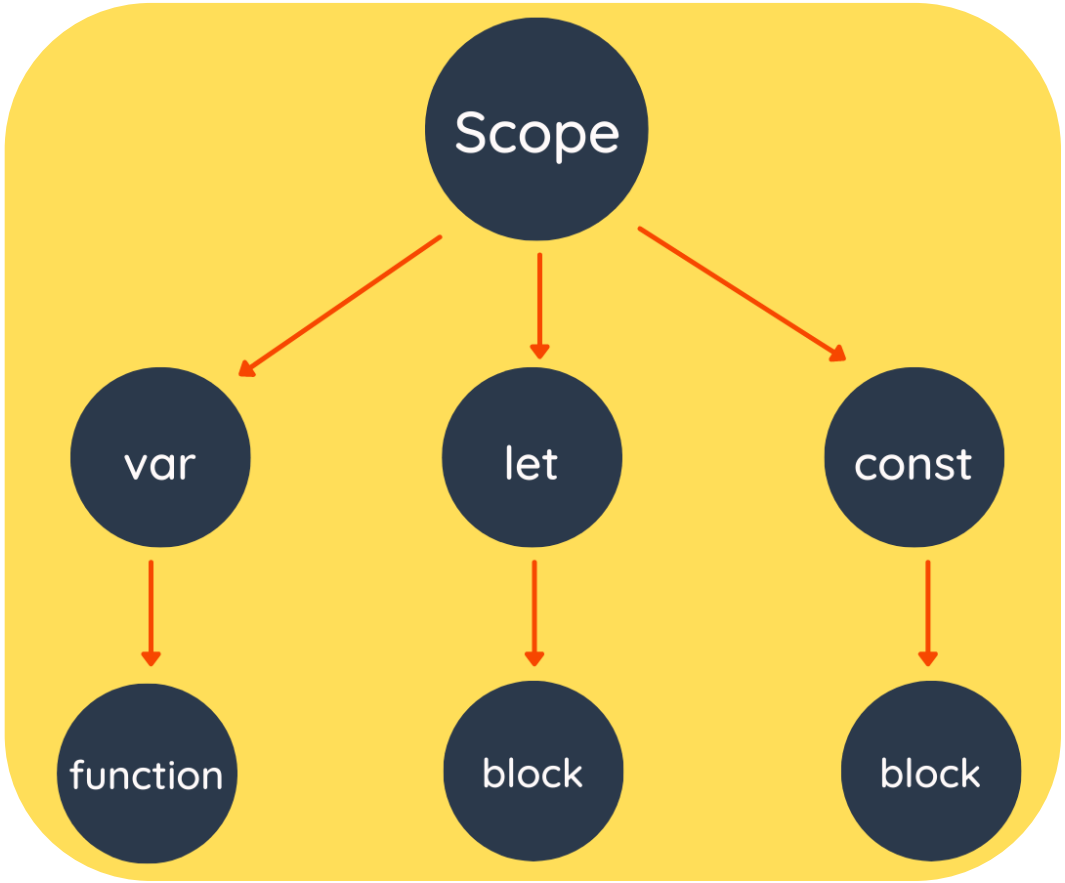
Q. What are variables? What is the difference between var, let, and const ? V. IMP.

- Variables are used to **store** data.

```
var count = 10;
```



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Q. What are variables? What is the difference between var, let, and const ? V. IMP.

- var creates a **function-scoped** variable.

```
//using var
function example() {

  if (true) {

    var count = 10;
    console.log(count);
    //output: 10
  }

  console.log(count);
  //Output: 10
}
```

- let creates a **block-scoped** variable

```
//using let
function example() {

  if (true) {

    let count = 10;
    console.log(count);
    //Output: 10
  }

  console.log(count);
  //Output: Uncaught
  //Reference Error:
  //count is not defined
}
```

- const can be assigned only once, and its value **cannot be changed** afterwards.

```
// Using constant
const z = 10;
z = 20;

// This will result
//in an error
console.log(z);
```

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Q. What are data types in JS?

- A data type determines the **type of variable.**

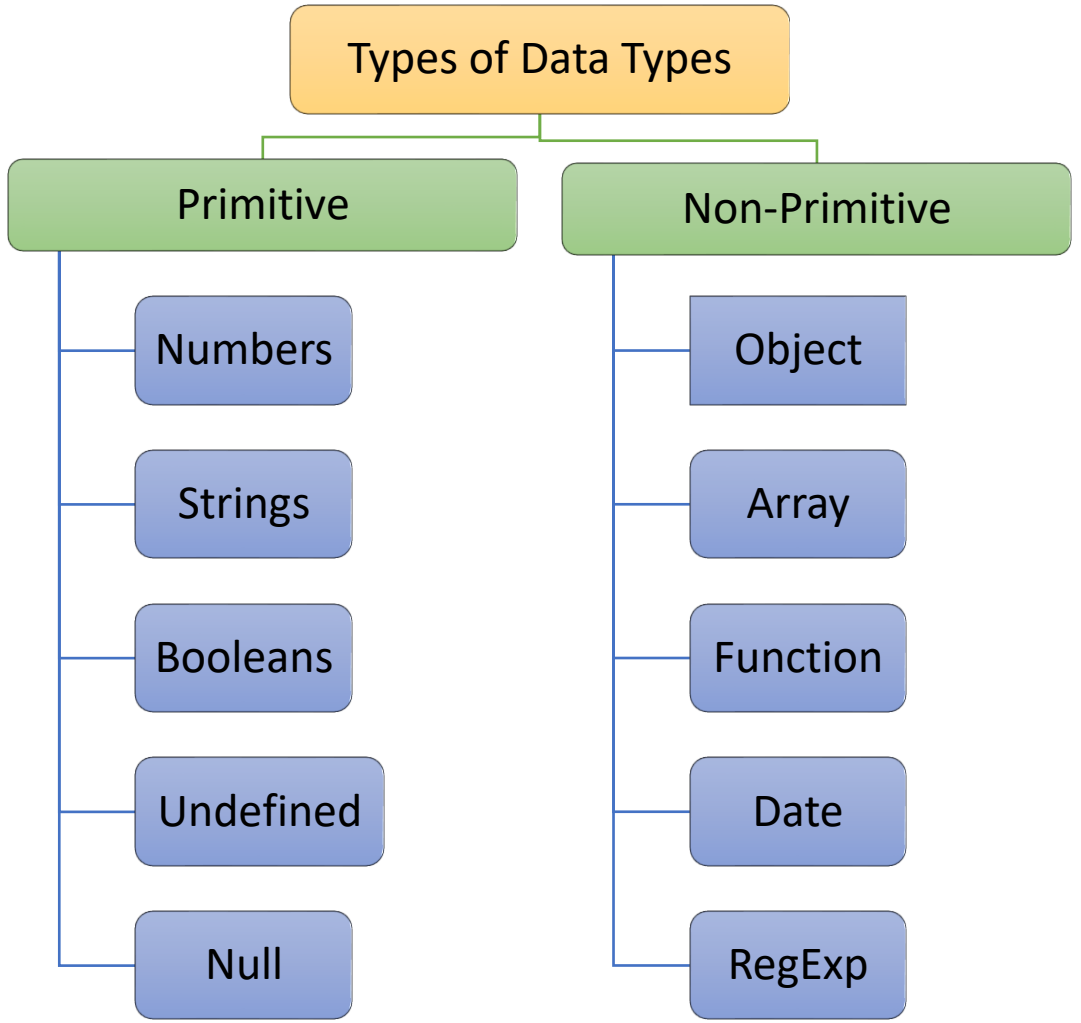
```
//Number
let age = 25;
```

```
//String
let message = 'Hello!';

//Boolean
let isTrue = true;

//Undefined
let x;
console.log(x);
// Output: undefined

//Null
let y = null;
console.log(y);
// Output: null
```



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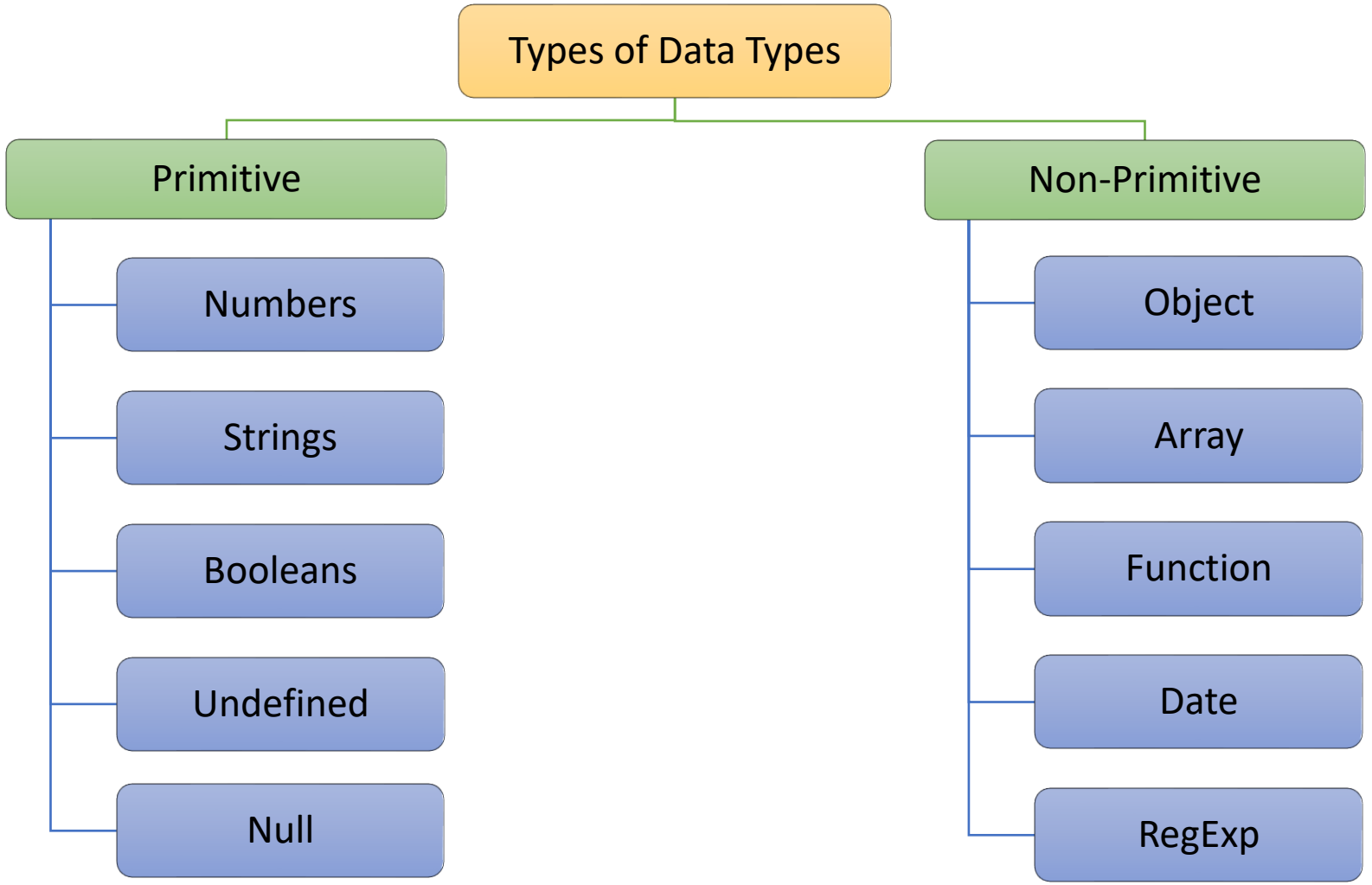
Q. What is the difference between primitive and non-primitive data types? V. IMP.



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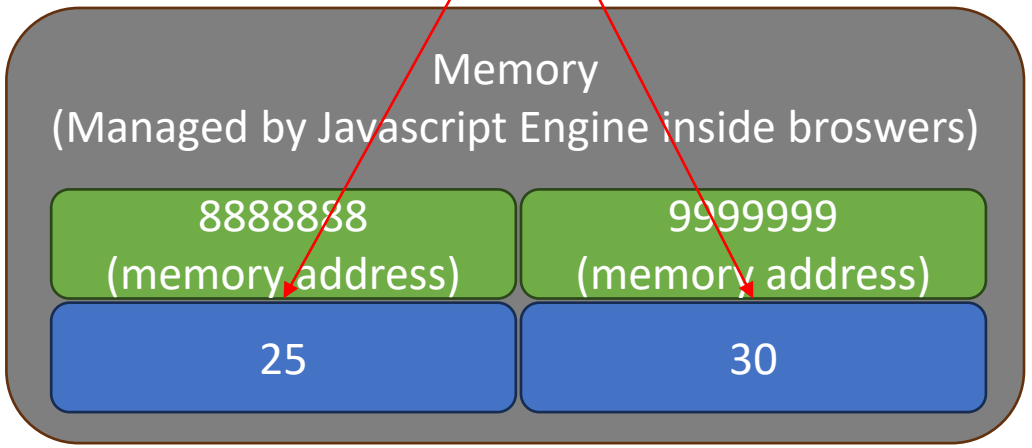
Q. What is the difference between primitive and non-primitive data types? V. IMP.

- Primitive data types can hold only **single** value.
- Primitive data types are **immutable**, meaning their values, once assigned, cannot be changed.

```
//Number
let age = 25;
    age = 30;
```



- Non primitive data types can hold **multiple** value.
- They are mutable and their values can be changed.

```
//Non primitive data types

//Array
let oddNumbers = [1, 3, 5]

//Object
let person = {
  name: "John",
  age: 30,
  grades: ["A","B","C"],
  greet: function() {
  console.log(this.name);
  }
};
```

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Q. What is the difference between primitive and non-primitive data types? V. IMP.

Primitive Data Types	Non-primitive Data Types
1. Number, string, Boolean, undefined, null are primitive data types.	Object, array, function, date, RegExp are non-primitive data types.
2. Primitive data types can hold only **single** value.	Non-primitive data types can hold **multiple** values and methods.
3. Primitive data types are **immutable** and their values cannot be changed.	Non-primitive data types are **mutable** and their values can be changed.
4. Primitive data types are **simple** data types.	Non-primitive data types are **complex** data types.

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Q. What is the difference between null and undefined in JS?

```
let value1 = 0;

let value2 = '';
```

- (A stand on the wall with also a paper holder) Means there is a **valid variable** with also a value of **data type number**.

```
let value3 = null;
```

- (There is just a stand on the wall) Means there is a **valid variable** with a value of **no data type**.

```
let value4;
```

- (There is nothing on the wall) Means variable is **incomplete variable** and not assigned anything.

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Q. What is the difference between null and undefined in JS?

```
let undefinedVariable; //no value assigned
console.log(undefinedVariable);
// Output: undefined
```

- undefined: When a variable is declared but has **not been assigned a value**, it is automatically initialized with undefined.
- Undefined can be used when you don't have the value right now, but you will get it after some logic or operation.

```
let nullVariable = null; //null assigned
console.log(nullVariable);
// Output: null
```

- null: null variables are intentionally assigned the **null value**.
- Null can be used, when you are sure you do not have any value for the particular variable.

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Q. What is the use of typeof operator?

- typeof operator is used to determine the **type** of each variable.
- Real application use -> typeOf operator can be used to **validate the data** received from external sources(api).

```
let num = 42;
let str = "Hello, world!";
let bool = true;
let obj = { key: "value" };
let arr = [1, 2, 3];
let func = function() {};
```

```
//using typeof
console.log(typeof num); // Output: "number"
console.log(typeof str); // Output: "string"
console.log(typeof bool); // Output: "boolean"
console.log(typeof obj); // Output: "object"
console.log(typeof arr); // Output: "object"
console.log(typeof func); // Output: "function"
console.log(typeof undefinedVariable);
// Output: "undefined"
```

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Q. What is type coercion in JS?

- Type coercion is the automatic conversion of values from one data type to another during certain operations or comparisons.

- Uses of type coercion:

1. Type coercion can be used during **String and Number concatenation.**
2. Type coercion can be used while using **Comparison operators**.

```
let string = "42";
let number = 42;
let boolean = true;
let nullValue = null;
```

```
//Type coercion - automatic conversion
console.log(string + number); // Output: "4242"

console.log(number + boolean); // Output: 43

console.log(number == string); // Output: true
console.log(boolean == 1); // Output: true
console.log(boolean + nullValue); // Output: 1
```

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