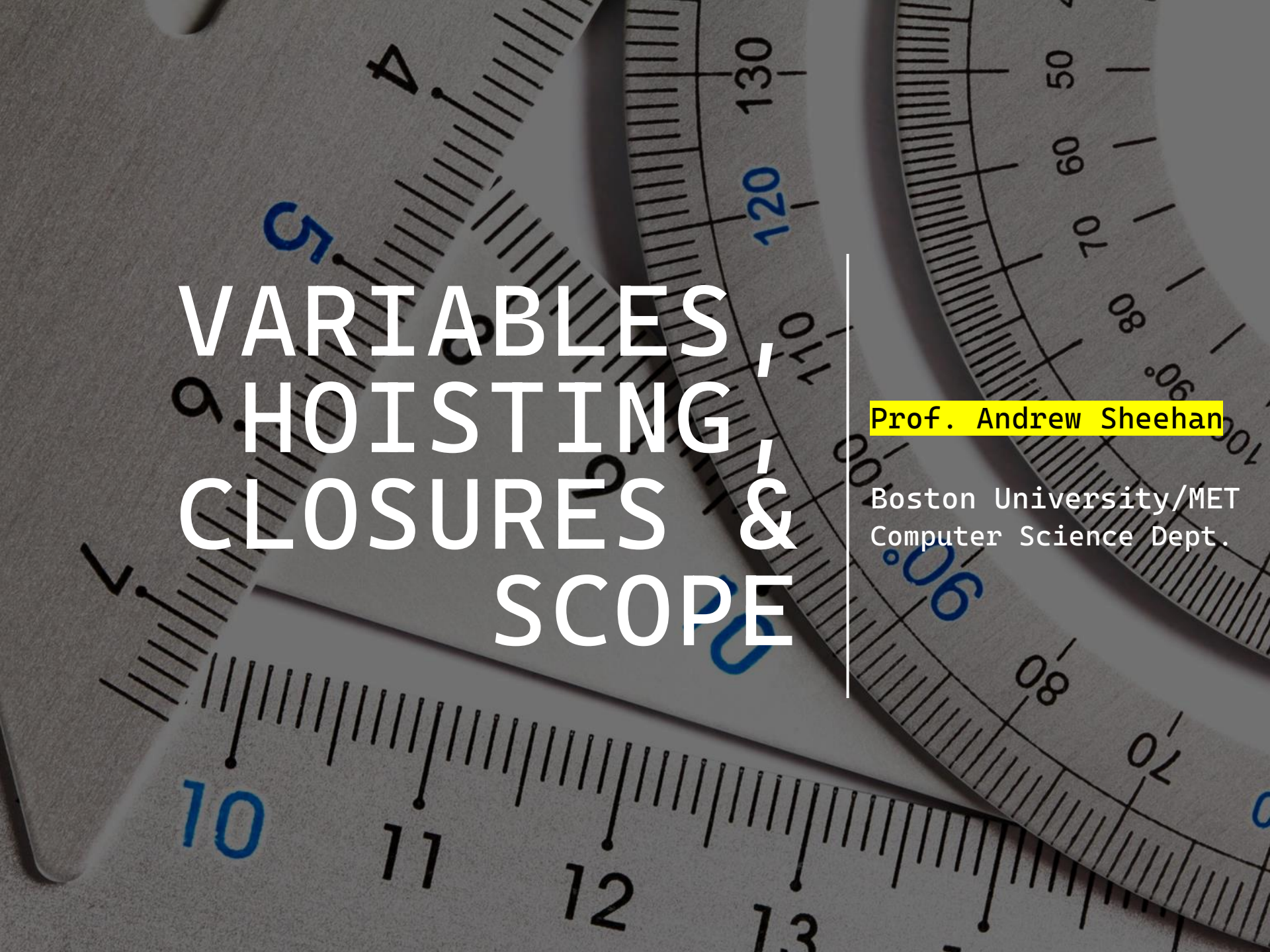

VARIABLES, HOISTING, CLOSURES & SCOPE

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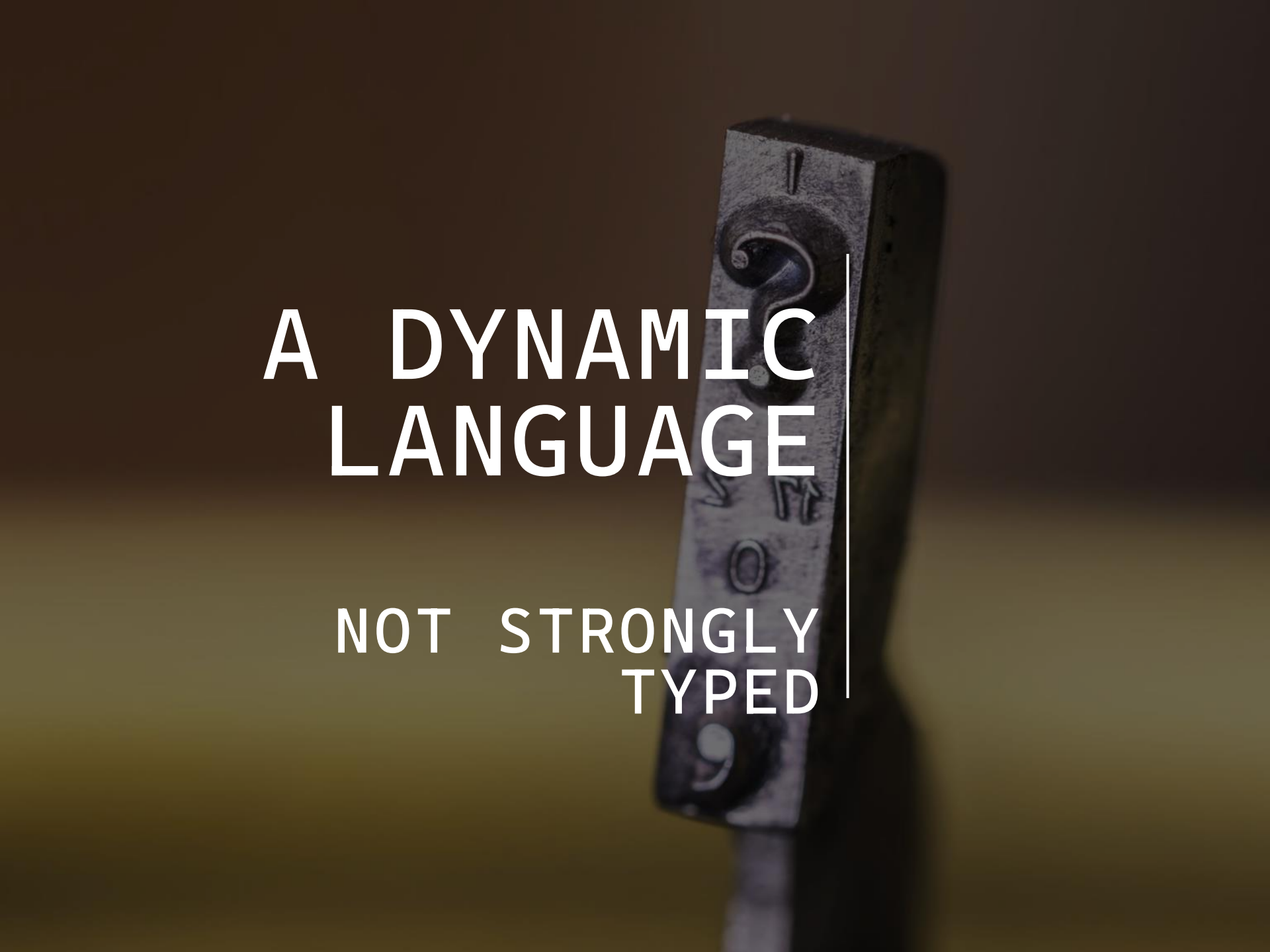
WHAT IS A VARIABLE?

Purpose:

Stores a value in a computer program


A DYNAMIC LANGUAGE
NOT STRONGLY TYPED

DATA TYPES

- Six **Data Types** that are primitives, checked by typeof operator:
  - undefined : `typeof instance === "undefined"`
  - Boolean : `typeof instance === "boolean"`
  - Number : `typeof instance === "number"`
  - String : `typeof instance === "string"`
  - BigInt : `typeof instance === "bigint"`
  - Symbol : `typeof instance === "symbol"`
- **Structural Types**:
  - Object : `typeof instance === "object"`. Special non-data but **Structural type** for any constructed object instance also used as data structures: new `Object`, new `Array`, new `Map`, new `Set`, new `WeakMap`, new `WeakSet`, new `Date` and almost everything made with new keyword;
  - Function : a non-data structure, though it also answers for `typeof` operator: `typeof instance === "function"`. This is merely a special shorthand for Functions, though every Function constructor is derived from Object constructor.
- **Structural Root** Primitive:
  - **null** : `typeof instance === "object"`. Special primitive type having additional usage for its value: if object is not inherited, then `null` is shown;

”Welcome to the course”

‘Welcome to the course’

`Welcome to the course`

CONST VAR & LET

const

Assigned?
Can't change

Block scoped.
Use it.

let

var

larger scope!

Difference Between `var`, `let`, and `const`

JavaScript has three different keywords to declare a variable, which adds an extra layer of intricacy to the language. The differences between the three are based on scope, hoisting, and reassignment.

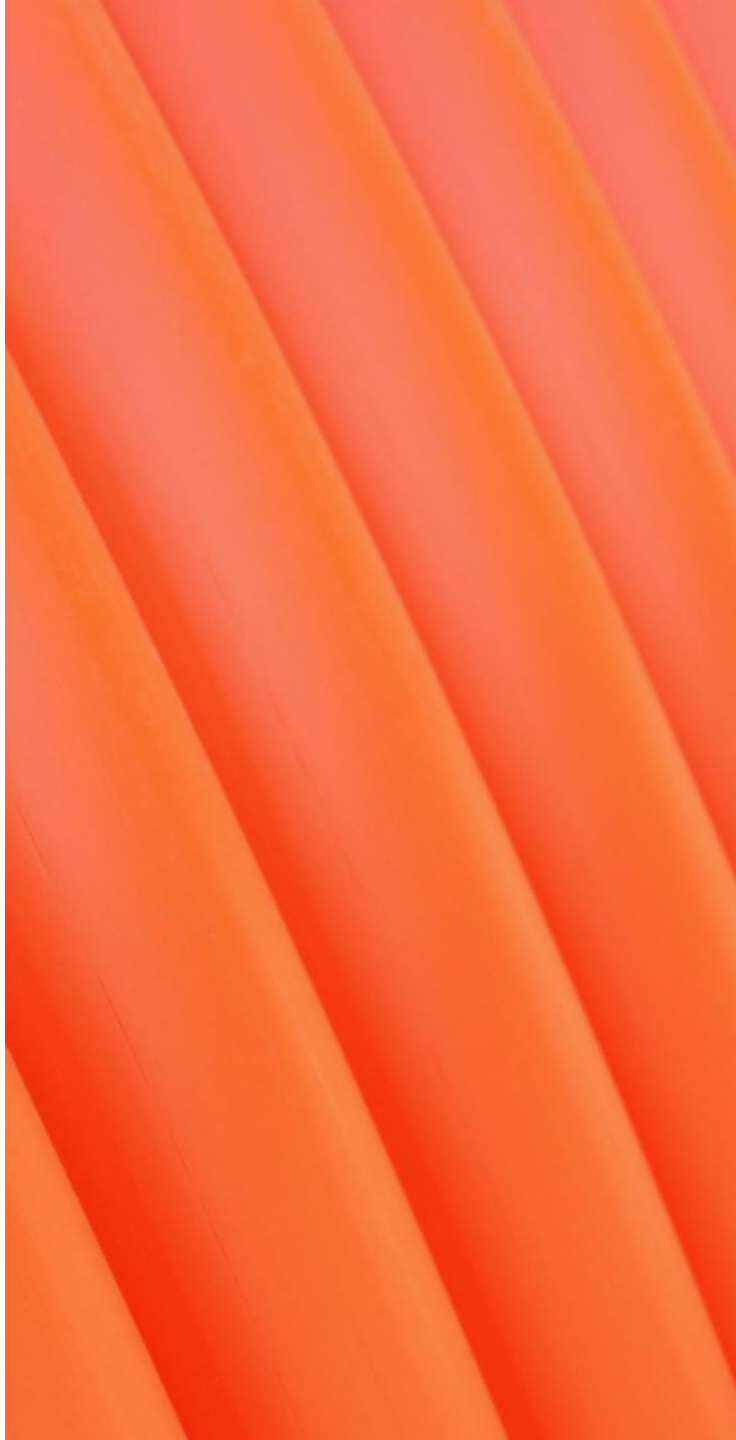
Keyword	Scope	Hoisting	Can Be Reassigned	Can Be Redeclared
`var`	Function scope	Yes	Yes	Yes
`let`	Block scope	No	Yes	No
`const`	Block scope	No	No	No

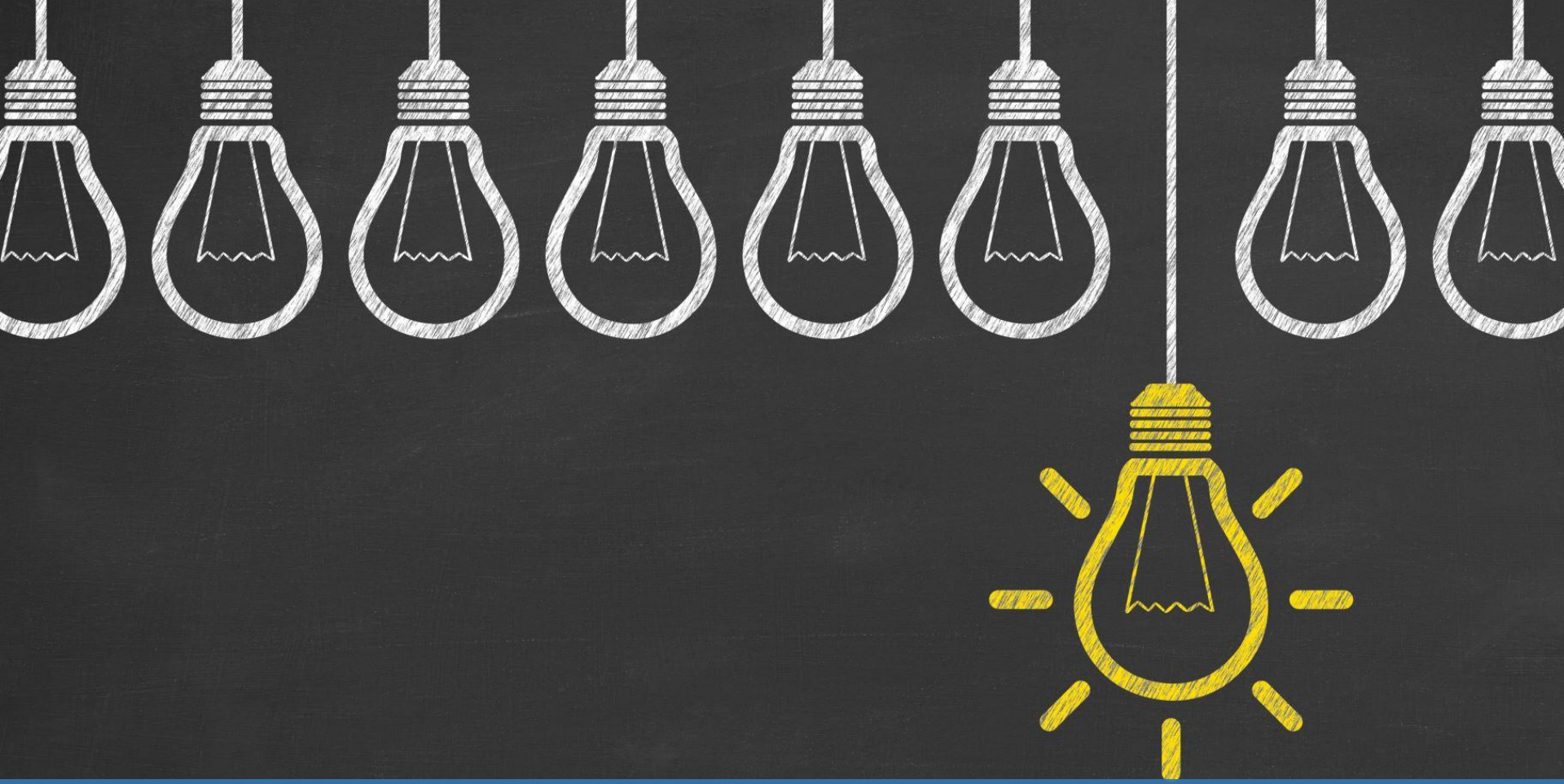
You may be wondering which of the three you should use in your own programs. A commonly accepted practice is to use `const` as much as possible, and `let` in the case of loops and reassignment. Generally, `var` can be avoided outside of working on legacy code.

TYPES OF SCOPE

1. Inside a block or function (local)

2. Outside a block (global)



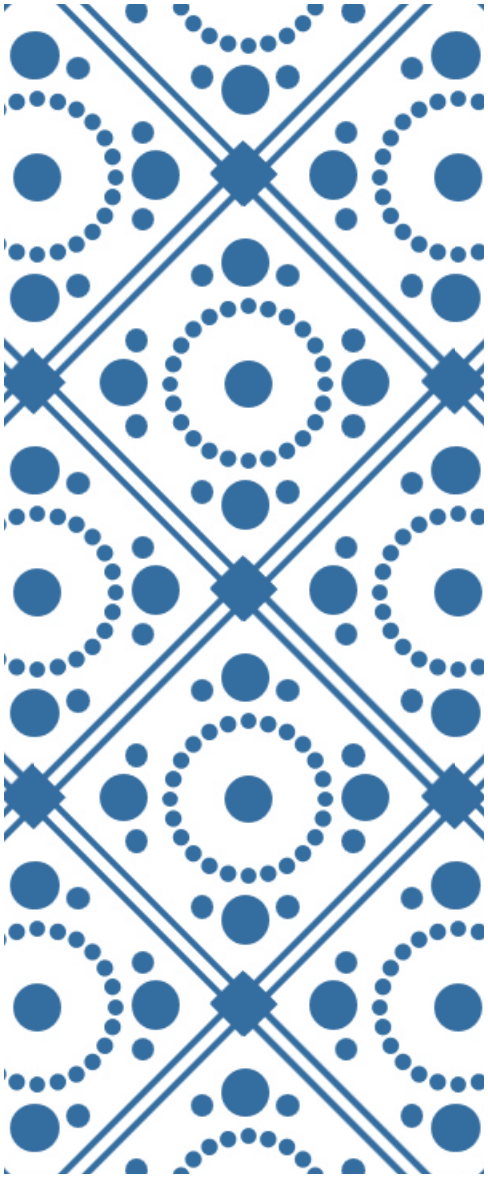


GLOBAL SCOPE

Outside any class, function or object

GLOBAL SCOPE

```
function check (A = 0) {
    return A > MAX;
}
```



When you use a variable before you assign something to it, the default value is `undefined`

`undefined` IS A PRIMITIVE TYPE


NULL
A place where unicorns live *and null, as well*

```
// Initialize x in the global scope
var x = 100;

function hoist() {
  // A condition that should not affect the outcome of the code
  if (false) {
    var x = 200;
  }
  console.log(x);
}

hoist();
```

Output

undefined

HOISTING

Hosting means the object declaration is moved up to the top of its scope.

HOISTING

All undeclared variables are global variables

```
//Notice lack of var, let or const
message = `happy`;
```

HOISTING EXAMPLE

```
function hoist() {
  a = 20;
  var b = 100;
}

hoist();

console.log(a);
/*
Accessible as a global variable outside hoist() function
Output: 20
*/

console.log(b);
/*
Since it was declared, it is confined to the hoist() function scope.
We can't print it out outside the confines of the hoist() function.
Output: ReferenceError: b is not defined
*/
```

CLOSURE

A **closure** is the combination of a function bundled together (enclosed) with references to its surrounding state (the **lexical environment**). In other words, a closure gives you access to an outer function's scope from an inner function. In JavaScript, closures are created every time a function is created, at function creation time.

```
function init() {
  var name = 'Mozilla'; // name is a local variable created by init
  function displayName() { // displayName() is the inner function, a closure
    alert(name); // use variable declared in the parent function
  }
  displayName();
}
init();
```

EXAMPLE

EXAMPLE

```
var counter = (function() {
  var privateCounter = 0;
  function changeBy(val) {
    privateCounter += val;
  }

  return {
    increment: function() {
      changeBy(1);
    },

    decrement: function() {
      changeBy(-1);
    },

    value: function() {
      return privateCounter;
    }
  };
})();

console.log(counter.value());  // 0.

counter.increment();
counter.increment();
console.log(counter.value());  // 2.

counter.decrement();
console.log(counter.value());  // 1.
```