What's the difference between using “let” and “var”?

Asked 12 years, 2 months ago Active 9 days ago Viewed 1.6m times

5203

1378

ECMAScript 6 introduced [the `let` statement](#).

I've heard that it's described as a `local` variable, but I'm still not quite sure how it behaves differently than the `var` keyword.

What are the differences?. When should `let` be used instead of `var`?

javascript scope ecmascript-6 var let

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edited Jun 3 at 13:35
TylerH
19.2k 50 65 86

asked Apr 17 '09 at 20:09
TM.
95.8k 30 120 125

114 ECMAScript is the standard and `let` is included in the [6th edition draft](#) and will most likely be in the final specification. – Richard Ayotte Mar 31 '12 at 15:08

6 See [kangax.github.io/es5-compat-table/es6](#) for an up to date support matrix of ES6 features (including let). At the time of writing Firefox, Chrome and IE11 all support it (although I believe FF's implementation is not quite standard). – Nico Burns Jan 17 '14 at 12:37

26 For the longest time I did not know that vars in a for loop were scoped to the function it was wrapped in. I remember figuring this out for the first time and thought it was very stupid. I do see some power though knowing now how the two could be used ffor different reason and how in some cases you might actually want to use a var in a for loop and not have it scoped to the block. – Eric Bishard May 7 '15 at 13:54

As ES6 feature support improves, the question concerning ES6 adoption shifts focus from feature support to performance differences. As such, [here's a site I found benchmarking performance differences between ES6 and ES5](#). Keep in mind this will likely change over time as engines optimize for ES6 code. – timolawl May 4 '16 at 1:02

3 This is a very good reading [wesbos.com/javascript-scoping](#) – onmyway133 Jun 15 '17 at 9:32

38 Answers

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Scoping rules

Main difference is scoping rules. Variables declared by `var` keyword are scoped to the immediate function body (hence the function scope) while `let` variables are scoped to the immediate *enclosing* block denoted by `{ }` (hence the block scope).

```
function run() {
  var foo = "Foo";
  let bar = "Bar";

  console.log(foo, bar); // Foo Bar

  {
    var moo = "Mooo"
    let baz = "Bazz";
    console.log(moo, baz); // Mooo Bazz
  }

  console.log(moo); // Mooo
  console.log(baz); // ReferenceError
}

run();
```

Run code snippet   Expand snippet

The reason why `let` keyword was introduced to the language was function scope is confusing and was one of the main sources of bugs in JavaScript.

Take a look at this example from another stackoverflow question:

```
var funcs = [];
// let's create 3 functions
for (var i = 0; i < 3; i++) {
  // and store them in funcs
  funcs[i] = function() {
    // each should log its value.
    console.log("My value: " + i);
  };
}
for (var j = 0; j < 3; j++) {
  // and now let's run each one to see
  funcs[j]();
}
```

Run code snippet   Expand snippet

`My value: 3` was output to console each time `funcs[j]();` was invoked since anonymous functions were bound to the same variable.

While variables declared with `var` keyword are hoisted (initialized with `undefined` before the code is run) which means they are accessible in their enclosing scope even before they are declared:

```
function run() {
  console.log(foo); // undefined
  var foo = "Foo";
  console.log(foo); // Foo
}

run();
```

Run code snippet   Expand snippet

`let` variables are not initialized until their definition is evaluated. Accessing them before the initialization results in a `ReferenceError`. Variable said to be in "temporal dead zone" from the start of the block until the initialization is processed.

```
function checkHoisting() {
  console.log(foo); // ReferenceError
  let foo = "Foo";
  console.log(foo); // Foo
}

checkHoisting();
```

Run code snippet   Expand snippet

Creating global object property

At the top level, `let`, unlike `var`, does not create a property on the global object:

```
var foo = "Foo";  // globally scoped
let bar = "Bar"; // not allowed to be globally scoped

console.log(window.foo); // Foo
console.log(window.bar); // undefined
```

```
var foo = "foo1";
var foo = "foo2"; // No problem, 'foo1' is replaced with 'foo2'.

let bar = "bar1";
let bar = "bar2"; // SyntaxError: Identifier 'bar' has already been declared
```

Run code snippet   Expand snippet

Share Improve this answer Follow   edited Jun 24 at 11:27   community wiki
35 revs, 25 users 27%
ThinkingStiff

37 Remember you can create block whenever you want. function() { code;{ let inBlock = 5; } code; }; – average Joe Dec 14 '12 at 10:14

205 So is the purpose of let statements only to free up memory when not needed in a certain block? – NoBugs Jun 7 '13 at 5:18

239 @NoBugs, Yes, and it is encouraged that variables are existent only where they are needed. – batman Jun 7 '13 at 15:02

68 `let` block expression `let (variable declaration) statement` is non-standard and will be removed in future, bugzilla.mozilla.org/show_bug.cgi?id=1023609. – Gajus Dec 17 '14 at 14:51

36 So, I just cannot think of any case where using var is of any use. Could someone give me an example of a situation where it's preferable to use var? – Luis Sieira Nov 8 '15 at 13:12

711

`let` can also be used to avoid problems with closures. It binds fresh value rather than keeping an old reference as shown in examples below.

```
for(var i=1; i<6; i++) {
  $("#div" + i).click(function () { console.log(i); });
}
```

```
<script src="https://cdnjs.cloudflare.com/ajax/libs/jquery/3.3.1/jquery.min.js">
</script>
<p>Clicking on each number will log to console:</p>
<div id="div1">1</div>
<div id="div2">2</div>
<div id="div3">3</div>
<div id="div4">4</div>
<div id="div5">5</div>
```

Run code snippet   Expand snippet

Code above demonstrates a classic JavaScript closure problem. Reference to the `i` variable is being stored in the click handler closure, rather than the actual value of `i`.

Every single click handler will refer to the same object because there's only one counter object which holds 6 so you get six on each click.

A general workaround is to wrap this in an anonymous function and pass `i` as an argument. Such issues can also be avoided now by using `let` instead `var` as shown in the code below.

(Tested in Chrome and Firefox 50)

```
for(let i=1; i<6; i++) {
  $("#div" + i).click(function () { console.log(i); });
}
```

```
<script src="https://cdnjs.cloudflare.com/ajax/libs/jquery/3.3.1/jquery.min.js">
</script>
<p>Clicking on each number will log to console:</p>
<div id="div1">1</div>
<div id="div2">2</div>
<div id="div3">3</div>
<div id="div4">4</div>
<div id="div5">5</div>
```

Run code snippet   Expand snippet

Share Improve this answer   edited Oct 29 '19 at 8:47   answered May 27 '15 at 10:16

62 That is actually cool. I would expect "i" to be defined outside the loop body contains within brackets and to NOT form a "closure" around "i".Of course your example proves otherwise. I think it is a bit confusing from the syntax point of view but this scenario is so common it makes sense to support it in that way. Many thanks for bringing this up. – Karol Kolenda Jul 27 '15 at 12:49

9 IE 11 supports `let`, but it alerts "6" for all the buttons. Do you have any source saying how `let` is supposed to behave? – Jim Hunziker Oct 22 '15 at 13:29

10 Looks like your answer is the correct behavior: developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/... – Jim Hunziker Oct 22 '15 at 13:32

13 Indeed this is a common pitfall in Javascript and now I can see why `let` would be really useful. Setting event listeners in a loop no longer requires an immediatelly invoked function expression for locally scoping `i` at each iteration. – Adrian Moisa Feb 21 '16 at 8:12

20 The use of "let" just defers this problem. So each iteration creates a private independent block scope, but the "i" variable can still be corrupted by subsequent changes within the block, (granted the iterator variable is not *usually* changed within the block, but other declared let variables within the block may well be) and any function declared within the block can, when invoked, corrupt the value of "i" for other functions declared within the block because they *do* share the same private block scope hence the same reference to "i". – gary Sep 7 '16 at 23:10

264

What's the difference between `let` and `var`?

- A variable defined using a `var` statement is known throughout **the function** it is defined in, from the start of the function. *(*)*
- A variable defined using a `let` statement is only known in **the block** it is defined in, from the moment it is defined onward. *(**)*

To understand the difference, consider the following code:

```
// i IS NOT known here
// j IS NOT known here
// k IS known here, but undefined
// l IS NOT known here

function loop(arr) {
    // i IS known here, but undefined
    // j IS NOT known here
    // k IS known here, but has a value only the second time loop is called
    // l IS NOT known here

    for( var i = 0; i < arr.length; i++ ) {
        // i IS known here, and has a value
        // j IS NOT known here
        // k IS known here, but has a value only the second time loop is called
        // l IS NOT known here
    };

    // i IS known here, and has a value
    // j IS NOT known here
    // k IS known here, but has a value only the second time loop is called
    // l IS NOT known here

    for( let j = 0; j < arr.length; j++ ) {
        // i IS known here, and has a value
        // j IS known here, and has a value
        // k IS known here, but has a value only the second time loop is called
        // l IS NOT known here
    };

    // i IS known here, and has a value
    // j IS NOT known here
    // k IS known here, but has a value only the second time loop is called
    // l IS NOT known here
}

loop([1,2,3,4]);

for( var k = 0; k < arr.length; k++ ) {
    // i IS NOT known here
    // j IS NOT known here
    // k IS known here, and has a value
    // l IS NOT known here
};

for( let l = 0; l < arr.length; l++ ) {
    // i IS NOT known here
    // j IS NOT known here
    // k IS known here, and has a value
    // l IS known here, and has a value
};
```

Here, we can see that our variable `j` is only known in the first for loop, but not before and after. Yet, our variable `i` is known in the entire function.

Also, consider that block scoped variables are not known before they are declared because they are not hoisted. You're also not allowed to redeclare the same block scoped variable within the same block. This makes block scoped variables less error prone than globally or functionally scoped variables, which are hoisted and which do not produce any errors in case of multiple declarations.

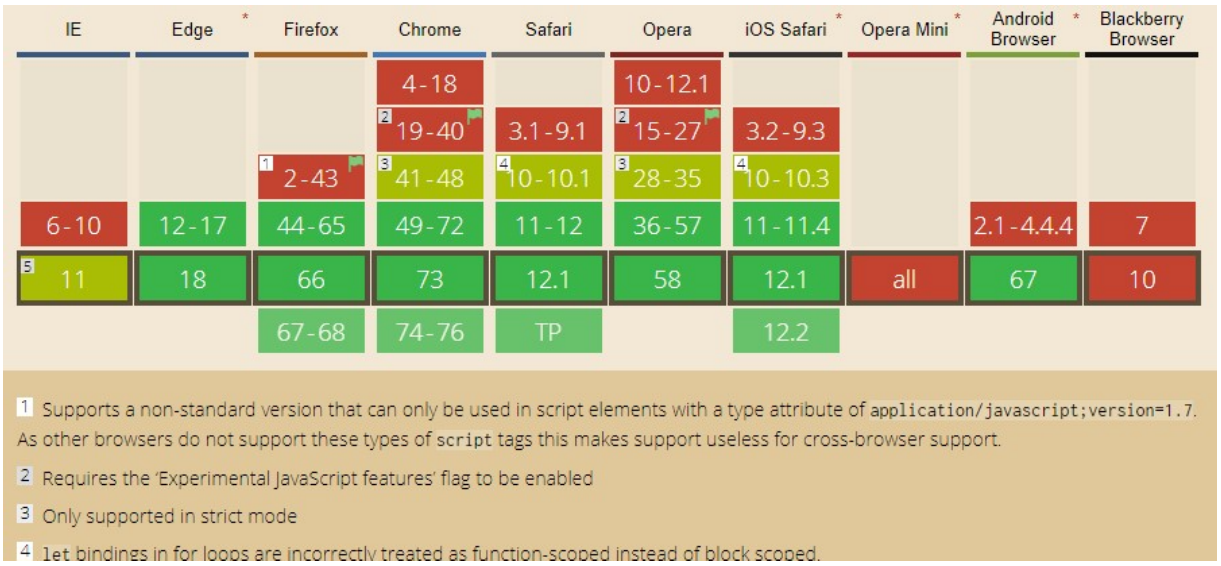
Is it safe to use `let` today?

Some people would argue that in the future we'll ONLY use let statements and that var statements will become obsolete. JavaScript guru **Kyle Simpson** wrote **a very elaborate article on why he believes that won't be the case**.

Today, however, that is definitely not the case. In fact, we need actually to ask ourselves whether it's safe to use the `let` statement. The answer to that question depends on your environment:

- If you're writing server-side JavaScript code (**Node.js**), you can safely use the `let` statement.
- If you're writing client-side JavaScript code and use a browser based transpiler (like **Traceur** or **babel-standalone**), you can safely use the `let` statement, however your code is likely to be anything but optimal with respect to performance.
- If you're writing client-side JavaScript code and use a Node based transpiler (like the **traceur shell script** or **Babel**), you can safely use the `let` statement. And because your browser will only know about the transpiled code, performance drawbacks should be limited.
- If you're writing client-side JavaScript code and don't use a transpiler, you need to consider browser support.

  There are still some browsers that don't support `let` at all :



IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android * Browser	Blackberry Browser
			4-18		10-12.1				
			[2] 19-40	3.1-9.1	[2] 15-27	3.2-9.3			
		[1] 2-43	[3] 41-48	[4] 10-10.1	[3] 28-35	[4] 10-10.3			
6-10	12-17	44-65	49-72	11-12	36-57	11-11.4		2.1-4.4.4	7
[5] 11	18	66	73	12.1	58	12.1	all	67	10
		67-68	74-76	TP		12.2			

[1] Supports a non-standard version that can only be used in script elements with a type attribute of `application/javascript;version=1.7`. As other browsers do not support these types of `script` tags this makes support useless for cross-browser support.

[2] Requires the 'Experimental JavaScript features' flag to be enabled

[3] Only supported in strict mode

[4] `let` bindings in for loops are incorrectly treated as function-scoped instead of block scoped.

your reading this answer, see **this `Can I Use` page**.

(*) Globally and functionally scoped variables can be initialized and used before they are declared because JavaScript variables are ***hoisted***. This means that declarations are always much to the top of the scope.

(**) Block scoped variables are not hoisted

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edited Jun 20 '20 at 9:12
Community ♦
1 1

answered Feb 23 '16 at 18:35
John Slegers
38.7k 17 183 154

16 regarding answer v4: `i` IS known everywhere in the function-block! It starts as `undefined` (due to hoisting) until you assign a value! ps: `let` is also hoisted (to the top of it's containing block), but will give a `ReferenceError` when referenced in the block before first assignment. (ps2: I'm a pro-semicolon kinda guy but you really don't need a semicolon after a block). That being said, thanks for adding the reality-check regarding support! – GitaarLAB May 21 '16 at 4:41

@GitaarLAB : According to the Mozilla Developer Network : "In ECMAScript 2015, let bindings are not subject to Variable Hoisting, which means that let declarations do not move to the top of the current execution context." - Anyway, I made a few improvements to my answer that should clarify the difference in hoisting behavior between `let` and `var` ! – John Slegers Feb 26 '18 at 23:37

1 Your answer improved a lot (I thoroughly checked). Note that same link you referenced in your comment also says: "The (let) variable is in a "temporal dead zone" from the *start of the block* until the initialization is processed." That means that the 'identifier' (the text-string 'reserved' to point to 'something') *is already* reserved in the relevant scope, otherwise it would become part of the root/host/window scope. To me personally, 'hoisting' means nothing more than reserving/linking declared 'identifiers' to their relevant scope; excluding their initialization/assignment/modifyability! – GitaarLAB Mar 1 '18 at 18:16

And..+1. That Kyle Simpson article you linked is an *excellent* read, thank you for that! It is also clear about the "temporal dead zone" aka "TDZ". One interesting thing I'd like to add: I've read on MDN that `let` and `const` were *recommended to only use when you actually need their additional functionality*, because enforcing/checking these extra features (like write-only const) result in 'more work' (and additional scope-nodes in the scope-tree) for the (current)engine(s) to enforce/check /verify/setup. – GitaarLAB Mar 1 '18 at 18:17

1 Note that MDN says that IE DOES interpret let correctly. Which is it? developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/... – Katinka Hesselink Feb 6 '19 at 12:42

154

Here's an explanation of the `let` keyword with some examples.

> `let` works very much like `var`. The main difference is that the scope of a `var` variable is the entire enclosing function

This table on Wikipedia shows which browsers support Javascript 1.7.

Note that only Mozilla and Chrome browsers support it. IE, Safari, and potentially others don't.

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edited Jun 24 '19 at 2:52
Jack Bashford **38.6k** 10 36 67

answered Apr 17 '09 at 20:11
Ben S **65.6k** 30 165 210

5 The key bit of text from the linked document seems to be, "let works very much like var. The main difference is that the scope of a var variable is the entire enclosing function". – Michael Burr Apr 17 '09 at 20:25

55 @olliej, actually Mozilla is just ahead of the game. See page 19 of ecma-international.org/publications/files/ECMA-ST/Ecma-262.pdf – Tyler Crompton Jun 18 '12 at 20:16

@TylerCrompton that's just the set of words that have been reserved for years. When mozilla added let it was purely a mozilla extension, with no related spec. ES6 should define behaviour for let statements, but that came after mozilla introduced the syntax. Remember moz also has E4X, which is entirely dead and moz only. – olliej Jul 11 '12 at 18:49

9 IE11 added support for `let` msdn.microsoft.com/en-us/library/ie/dn342892%28v=vs.85%29.aspx – eloyesp Dec 24 '13 at 12:59

Now `let` support all latest browser today except Opera, Blackberry & QQ Browsers. – Shapon Pal Jan 8 '19 at 5:11

125

The accepted answer is missing a point:

```
{
  let a = 123;
};

console.log(a); // ReferenceError: a is not defined
```

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edited Jul 14 '16 at 14:13
William **393** 7 20

answered Jun 2 '15 at 20:59
Lcf.vs **1,539** 1 10 14

19 The accepted answer does NOT explain this point in its example. The accepted answer only demonstrated it in a `for` loop initializer, dramatically narrowing the scope of application of the limitations of `let`. Upvoted. – Jon Davis Sep 22 '15 at 6:55

43 @stimpy77 It explicitly states "let is scoped to the nearest enclosing block"; does every way that manifests need to be included? – Dave Newton Mar 31 '16 at 21:32

7 there were a lot of examples and none of them properly demonstrated the matter .. I might've upvoted both the accepted answer and this one? – Jon Davis Mar 31 '16 at 21:38

6 This contribution demonstrates that a "block" can simply be a set of lines enclosed in brackets; i.e. it doesn't need to be associated with any sort of control flow, loop, etc. – webelo Nov 22 '17 at 14:37

Worth +9999 but I can't give it... – Logan Devine May 28 at 15:16

108

let

Block scope

Variables declared using the `let` keyword are block-scoped, which means that they are available only in the [block](https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Statements/block) in which they were declared.

At the top level (outside of a function)

At the top level, variables declared using `let` don't create properties on the global object.

```
var globalVariable = 42;
let blockScopedVariable = 43;

console.log(globalVariable); // 42
console.log(blockScopedVariable); // 43

console.log(this.globalVariable); // 42
console.log(this.blockScopedVariable); // undefined
```

Inside a function

Inside a function (but outside of a block), `let` has the same scope as `var` .

```
(() => {
  var functionScopedVariable = 42;
  let blockScopedVariable = 43;

  console.log(functionScopedVariable); // 42
  console.log(blockScopedVariable); // 43
})();

console.log(functionScopedVariable); // ReferenceError: functionScopedVariable is not
defined
console.log(blockScopedVariable); // ReferenceError: blockScopedVariable is not defined
```

Inside a block

Variables declared using `let` inside a block can't be accessed outside that block.

```
{
  var globalVariable = 42;
  let blockScopedVariable = 43;
  console.log(globalVariable); // 42
  console.log(blockScopedVariable); // 43
}

console.log(globalVariable); // 42
console.log(blockScopedVariable); // ReferenceError: blockScopedVariable is not defined
```

Inside a loop

```
console.log(i); // 3
console.log(j); // 4

for (let k = 0; k < 3; k++) {
  let l = k * 2;
}
console.log(typeof k); // undefined
console.log(typeof l); // undefined
// Trying to do console.log(k) or console.log(l) here would throw a ReferenceError.
```

Loops with closures

If you use `let` instead of `var` in a loop, with each iteration you get a new variable. That means that you can safely use a closure inside a loop.

```
// Logs 3 thrice, not what we meant.
for (var i = 0; i < 3; i++) {
  setTimeout(() => console.log(i), 0);
}

// Logs 0, 1 and 2, as expected.
for (let j = 0; j < 3; j++) {
  setTimeout(() => console.log(j), 0);
}
```

Temporal dead zone

Because of the temporal dead zone, variables declared using `let` can't be accessed before they are declared. Attempting to do so throws an error.

```
console.log(noTDZ); // undefined
var noTDZ = 43;
console.log(hasTDZ); // ReferenceError: hasTDZ is not defined
let hasTDZ = 42;
```

No re-declaring

You can't declare the same variable multiple times using `let`. You also can't declare a variable using `let` with the same identifier as another variable which was declared using `var`.

```
var a;
var a; // Works fine.

let b;
```

No re-assigning

Variable declared using `const` can't be re-assigned.

```
const a = 42;
a = 43; // TypeError: Assignment to constant variable.
```

Note that it doesn't mean that the value is immutable. Its properties still can be changed.

```
const obj = {};
obj.a = 42;
console.log(obj.a); // 42
```

If you want to have an immutable object, you should use `Object.freeze()` .

Initializer is required

You always must specify a value when declaring a variable using `const` .

```
const a; // SyntaxError: Missing initializer in const declaration
```

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edited Oct 25 '18 at 20:54
ketchupisred
631 3 16

answered Nov 23 '16 at 22:52
Michał Perłakowski
72k 24 138 156

This is very clear explanation about declaration in JS ... And suddenly realized where is my problem in one of the `for` loops :-| – 1000Gbps Apr 7 at 3:04

75

In most basic terms,

```
for (let i = 0; i < 5; i++) {
  // i accessible ✅
}
// i not accessible ❌
```

```
for (var i = 0; i < 5; i++) {
  // i accessible ✅
}
// i accessible ✅
```

⚡ Sandbox to play around ↓

Edit on CodeSandbox

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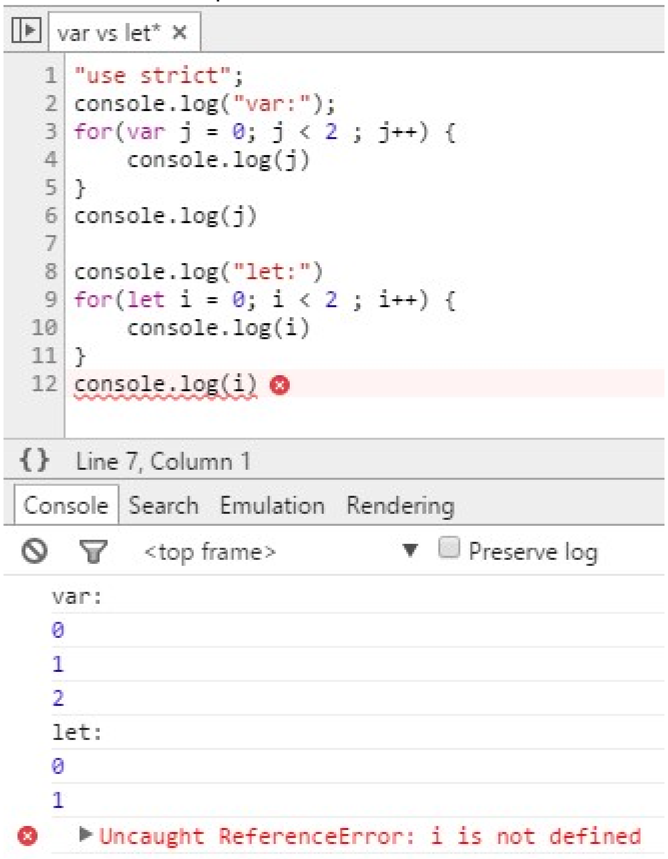
answered May 11 '20 at 17:04

Hasan Sefa Ozalp
2,601 20 29

58

Here is an example for the difference between the two (support just started for chrome):



```
"use strict";
console.log("var:");
for(var j = 0; j < 2 ; j++) {
    console.log(j)
}
console.log(j)

console.log("let:")
for(let i = 0; i < 2 ; i++) {
    console.log(i)
}
console.log(i)
```

```
var:
0
1
2
let:
0
1
▶Uncaught ReferenceError: i is not defined
```

As you can see the `var j` variable is still having a value outside of the for loop scope (Block Scope), but the `let i` variable is undefined outside of the for loop scope.

```
"use strict";
console.log("var:");
for (var j = 0; j < 2; j++) {
  console.log(j);
}

console.log(j);

console.log("let:");
for (let i = 0; i < 2; i++) {
  console.log(i);
}

console.log(i);
```

Run code snippet   Expand snippet

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edited Jun 5 '19 at 12:03

answered Mar 6 '15 at 10:41

vlio20
7,830 16 85 163

2 What tool am I looking at here? – Barton Mar 24 '15 at 21:43

As a developer of desktop applets for Cinnamon, I haven't been exposed to such shiny tools. – Barton Oct 26 '17 at 4:20

56

The main difference is the **scope** difference, while **let** can be only available inside the **scope** it's declared, like in for loop, **var** can be accessed outside the loop for example. From the documentation in [MDN](MDN) (examples also from MDN):

> **let** allows you to declare variables that are limited in scope to the block, statement, or expression on which it is used. This is unlike the **var** keyword, which defines a variable globally, or locally to an entire function regardless of block scope.
>
> Variables declared by **let** have as their scope the block in which they are defined, as well as in any contained sub-blocks. In this way, **let** works very much like **var**. The main difference is that the scope of a **var** variable is the entire enclosing function:

```
function varTest() {
  var x = 1;
  if (true) {
    var x = 2;  // same variable!
    console.log(x);  // 2
  }
  console.log(x);  // 2
}

function letTest() {
  let x = 1;
  if (true) {
    let x = 2;  // different variable
    console.log(x);  // 2
  }
  console.log(x);  // 1
}`
```

> At the top level of programs and functions, **let**, unlike **var**, does not create a property on the global object. For example:

```
var x = 'global';
let y = 'global';
console.log(this.x); // "global"
console.log(this.y); // undefined
```

> When used inside a block, let limits the variable's scope to that block. Note the difference between **var** whose scope is inside the function where it is declared.

```
var a = 1;
var b = 2;

if (a === 1) {
  var a = 11; // the scope is global
  let b = 22; // the scope is inside the if-block

  console.log(a);  // 11
```

Also don't forget it's ECMA6 feature, so it's not fully supported yet, so it's better always transpiles it to ECMA5 using Babel etc... for more info about visit babel website

Share Improve this answer Follow   edited Jan 18 '19 at 7:03   answered Mar 22 '17 at 14:39 Alireza 84.7k 19 242 152

I don't know if that last example is accurate. Because by calling it not from a function but a direct command line its still considered part of the same function. So, if you called it from outside of a function, it shouldn't behave in the same way. – ACopeLan Aug 28 '20 at 18:20

56

There are some subtle differences — `let` scoping behaves more like variable scoping does in more or less any other languages.

e.g. It scopes to the enclosing block, They don't exist before they're declared, etc.

However it's worth noting that `let` is only a part of newer Javascript implementations and has varying degrees of browser support.

Share Improve this answer Follow   edited Jun 24 '19 at 2:53 Jack Bashford 38.6k 10 36 67   answered Apr 17 '09 at 21:38 olliej 32.9k 8 55 54

11 It's also worth noting that ECMAScript is the standard and `let` is included in the 6th edition draft and will most likely be in the final specification. – Richard Ayotte Mar 31 '12 at 15:09

24 That's the difference 3 years makes :D – olliej Apr 13 '12 at 3:28

5 Just stubled across this question and in 2012 it is still the case that only Mozilla browsers support `let` . Safari, IE, and Chome all don't. – pseudosavant Jul 13 '12 at 17:38

2 The idea of accidentally creating partial block scope on accident is a good point, beware, `let` does not hoist, to use a variable defined by a `let` defined at the top of your block. If you have an `if` statement that is more than just a few lines of code, you may forget that you cannot use that variable until after it is defined. GREAT POINT!!! – Eric Bishard May 7 '15 at 14:01

2 @EricB: yes and no: "In ECMAScript 2015, `let` **will hoist** the variable to the top of the block. However, referencing the variable in the block before the variable declaration results in a *ReferenceError* (my note: instead of good old `undefined`). The variable is in a 'temporal dead zone' from the start of the block until the declaration is processed." Same goes for "switch statements because there is only one underlying block". Source: developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/... – GitaarLAB May 21 '16 at 4:15

28

- ~~**Variable Not Hoisting**~~

  ~~`let` will **not hoist** to the entire scope of the block they appear in. By contrast, `var` could hoist as below.~~

  ```
  {
     console.log(cc); // undefined. Caused by hoisting
     var cc = 23;
  }

  {
     console.log(bb); // ReferenceError: bb is not defined
     let bb = 23;
  }
  ```

  Actually, Per @Bergi, Both `var` and `let` are hoisted.

- **Garbage Collection**

  Block scope of `let` is useful relates to closures and garbage collection to reclaim memory. Consider,

  ```
  function process(data) {
      //...
  }

  var hugeData = { .. };

  process(hugeData);

  var btn = document.getElementById("mybutton");
  btn.addEventListener( "click", function click(evt){
      //....
  });
  ```

  The `click` handler callback does not need the `hugeData` variable at all. Theoretically, after `process(..)` runs, the huge data structure `hugeData` could be garbage collected. However, it's possible that some JS engine will still have to keep this huge structure, since the `click` function has a closure over the entire scope.

  However, the block scope can make this huge data structure to garbage collected.

  ```
  function process(data) {
      //...
  }

  { // anything declared inside this block can be garbage collected
      let hugeData = { .. };
      process(hugeData);
  }

  var btn = document.getElementById("mybutton");
  btn.addEventListener( "click", function click(evt){
      //....
  });
  ```

- `let` **loops**

  `let` in the loop can **re-binds it** to each iteration of the loop, making sure to re-assign

```
}
```

However, replace `var` with `let`

```
// print 1, 2, 3, 4, 5. now
for (let i = 0; i < 5; ++i) {
    setTimeout(function () {
        console.log(i);
    }, 1000);
}
```

Because `let` create a new lexical environment with those names for a) the initialiser expression b) each iteration (previosly to evaluating the increment expression), more details are here.

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edited May 23 '17 at 12:34
Community ♦
1 1

answered Jan 17 '16 at 15:11
zangw
34.1k 17 128 155

4 Yip they are hoisted, but behave as if not hoisted because of the (drum roll) Temporal Dead Zone - a very dramatic name for an identifier not being accessible until it's declared:-) – Drenai Dec 31 '16 at 15:42

So let is hoisted, but unavailable? How is that different than 'not hoisted'? – N-ate Nov 21 '17 at 21:46

Hopefully Brian or Bergi come back to answer this. Is the declaration of let hoisted, but not the assignment? Thanks! – N-ate Nov 22 '17 at 16:18

1 @N-ate, Here is one post of Bergi, maybe you can find answer in it. – zangw Nov 23 '17 at 3:46

It's interesting it is even called hoisting when it comes to let. I get that technically the parsing engine is pre-capturing it, but for all intents and purposes a programmer should treat it as if it doesn't exist. The hoisting of var on the other hand has implications to a programmer. – N-ate Nov 23 '17 at 23:49

25

The difference is in the scope of the variables declared with each.

In practice, there are a number of useful consequences of the difference in scope:

1. `let` variables are only visible in their *nearest enclosing* block (`{ ... }`).
2. `let` variables are only usable in lines of code that occur *after* the variable is declared (even though they are hoisted!).
3. `let` variables may not be redeclared by a subsequent `var` or `let` .
4. Global `let` variables are not added to the global `window` object.
5. `let` variables are *easy to use* with closures (they do not cause race conditions).

The restrictions imposed by `let` reduce the visibility of the variables and increase the likelihood that unexpected name collisions will be found early. This makes it easier to track and reason about variables, including their reachability(helping with reclaiming unused memory).

Consequently, `let` variables are less likely to cause problems when used in large programs or when independently-developed frameworks are combined in new and unexpected ways.

`var` may still be useful if you are sure you want the single-binding effect when using a closure in a loop (#5) or for declaring externally-visible global variables in your code (#4). Use of `var` for exports may be supplanted if `export` migrates out of transpiler space and into the core language.

Examples

1. No use outside nearest enclosing block: This block of code will throw a reference error because the second use of `x` occurs outside of the block where it is declared with `let` :

```
{
    let x = 1;
}
console.log(`x is ${x}`);  // ReferenceError during parsing: "x is not defined".
```

In contrast, the same example with `var` works.

2. No use before declaration:
This block of code will throw a `ReferenceError` before the code can be run because `x` is used before it is declared:

```
{
    x = x + 1;  // ReferenceError during parsing: "x is not defined".
    let x;
    console.log(`x is ${x}`);  // Never runs.
}
```

```
let x = 1;
let x = 2;  // SyntaxError: Identifier 'x' has already been declared
```

4. Globals not attached to `window`:

```
var button = "I cause accidents because my name is too common.";
let link = "Though my name is common, I am harder to access from other JS files.";
console.log(link);  // OK
console.log(window.link);  // undefined (GOOD!)
console.log(window.button);  // OK
```

5. Easy use with closures: Variables declared with `var` do not work well with closures inside loops. Here is a simple loop that outputs the sequence of values that the variable `i` has at different points in time:

```
for (let i = 0; i < 5; i++) {
    console.log(`i is ${i}`), 125/*ms*/);
}
```

Specifically, this outputs:

```
i is 0
i is 1
i is 2
i is 3
i is 4
```

In JavaScript we often use variables at a significantly later time than when they are created. When we demonstrate this by delaying the output with a closure passed to `setTimeout`:

```
for (let i = 0; i < 5; i++) {
    setTimeout(_ => console.log(`i is ${i}`), 125/*ms*/);
}
```

... the output remains unchanged as long as we stick with `let`. In contrast, if we had used `var i` instead:

```
for (var i = 0; i < 5; i++) {
    setTimeout(_ => console.log(`i is ${i}`), 125/*ms*/);
}
```

... the loop unexpectedly outputs "i is 5" five times:

7 #5 is not caused by a race condition. By using `var` instead of `let`, the code is equivalent to: `var i = 0; while (i < 5) { doSomethingLater(); i++; }` `i` is outside the closure, and by the time that `doSomethingLater()` is executed, `i` has already been incremented 5 times, hence the output is `i is 5` five times. By using `let`, the variable `i` is within the closure, so each async call gets its own copy of `i` instead of using the 'global' one that's created with `var`. – Daniel T. Jun 2 '17 at 1:12

@DanielT.: I don't think the transformation of lifting the variable definition out of the loop initializer explains anything. That is simply the normal definition of the semantics of `for`. A more accurate transformation, though more complicated, is the classical `for (var i = 0; i < 5; i++) { (function(j) { setTimeout(_ => console.log(` i is ${j} `), 125/*ms*/); })(i); }` which introduces a "function-activation record" to save each value of `i` with the name of `j` inside the function. – mormegil Jul 25 '17 at 7:13

23

Here's an example to add on to what others have already written. Suppose you want to make an array of functions, `adderFunctions`, where each function takes a single Number argument and returns the sum of the argument and the function's index in the array. Trying to generate `adderFunctions` with a loop using the `var` keyword won't work the way someone might naïvely expect:

```
// An array of adder functions.
var adderFunctions = [];

for (var i = 0; i < 1000; i++) {
  // We want the function at index i to add the index to its argument.
  adderFunctions[i] = function(x) {
    // What is i bound to here?
    return x + i;
  };
}

var add12 = adderFunctions[12];

// Uh oh. The function is bound to i in the outer scope, which is currently 1000.
console.log(add12(8) === 20); // => false
console.log(add12(8) === 1008); // => true
console.log(i); // => 1000

// It gets worse.
i = -8;
console.log(add12(8) === 0); // => true
```

The process above doesn't generate the desired array of functions because `i`'s scope extends beyond the iteration of the `for` block in which each function was created. Instead, at the end of the loop, the `i` in each function's closure refers to `i`'s value at the end of the loop (1000) for every anonymous function in `adderFunctions`. This isn't what we wanted at all: we now have an array of 1000 different functions in memory with exactly the same behavior. And if we subsequently update the value of `i`, the mutation will affect all the `adderFunctions`.

However, we can try again using the `let` keyword:

```
// Let's try this again.
// NOTE: We're using another ES6 keyword, const, for values that won't
// be reassigned. const and let have similar scoping behavior.
const adderFunctions = [];

for (let i = 0; i < 1000; i++) {
  // NOTE: We're using the newer arrow function syntax this time, but
  // using the "function(x) { ..." syntax from the previous example
  // here would not change the behavior shown.
  adderFunctions[i] = x => x + i;
}

const add12 = adderFunctions[12];

// Yay! The behavior is as expected.
console.log(add12(8) === 20); // => true

// i's scope doesn't extend outside the for loop.
```

Now, image mixing the two behaviors and you'll probably see why it's not recommended to mix the newer `let` and `const` with the older `var` in the same script. Doing so can result is some spectacularly confusing code.

```
const doubleAdderFunctions = [];

for (var i = 0; i < 1000; i++) {
    const j = i;
    doubleAdderFunctions[i] = x => x + i + j;
}

const add18 = doubleAdderFunctions[9];
const add24 = doubleAdderFunctions[12];

// It's not fun debugging situations like this, especially when the
// code is more complex than in this example.
console.log(add18(24) === 42); // => false
console.log(add24(18) === 42); // => false
console.log(add18(24) === add24(18)); // => false
console.log(add18(24) === 2018); // => false
console.log(add24(18) === 2018); // => false
console.log(add18(24) === 1033); // => true
console.log(add24(18) === 1030); // => true
```

Don't let this happen to you. Use a linter.

> **NOTE:** This is a teaching example intended to demonstrate the `var` / `let` behavior in loops and with function closures that would also be easy to understand. This would be a terrible way to add numbers. But the general technique of capturing data in anonymous function closures might be encountered in the real world in other contexts. YMMV.

Share Improve this answer Follow   edited Oct 9 '17 at 22:24   answered Aug 18 '14 at 0:58
abroz
341 2 7

2 @aborz: Also very cool anonymous function syntax in the second example. It's just what I'm used to in C#. I've learned something today. – Barton Feb 20 '15 at 8:59

Correction: Technically, Arrow function syntax described here => developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/... – Barton Mar 16 '15 at 6:58

3 Actually, you don't need `let value = i;`. The `for` statement creates a lexical block. – Toothbrush Oct 22 '15 at 22:38

19

May the following two functions show the difference:

```
function varTest() {
    var x = 31;
    if (true) {
        var x = 71;  // Same variable!
        console.log(x);  // 71
    }
    console.log(x);  // 71
}

function letTest() {
    let x = 31;
    if (true) {
        let x = 71;  // Different variable
        console.log(x);  // 71
    }
    console.log(x);  // 31
}
```

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edited Nov 26 '16 at 16:18
Peter Mortensen
28.5k 21 95 123

answered Dec 17 '15 at 3:22
Abdennour TOUMI
66k 29 202 210

15

`let` is interesting, because it allows us to do something like this:

```
(() => {
    var count = 0;

    for (let i = 0; i < 2; ++i) {
        for (let i = 0; i < 2; ++i) {
            for (let i = 0; i < 2; ++i) {
                console.log(count++);
            }
        }
    }
})();
```

Which results in counting [0, 7].

Whereas

```
(() => {
    var count = 0;

    for (var i = 0; i < 2; ++i) {
        for (var i = 0; i < 2; ++i) {
            for (var i = 0; i < 2; ++i) {
                console.log(count++);
            }
        }
    }
})();
```

Only counts [0, 1].

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edited Nov 26 '16 at 16:34
Peter Mortensen
28.5k 21 95 123

answered Jul 8 '16 at 0:21
Dmitry
4,470 4 31 46

2 this is the first time i've ever seen anyone act like variable shadowing was desirable. no, the purpose of let is not to enable shadowing – John Haugeland Nov 24 '16 at 0:37

1 purpose? it's a construct, you can use it however you please, one of the interesting ways is like this. – Dmitry Nov 24 '16 at 0:39

15

Function VS block scope:

The main difference between `var` and `let` is that variables declared with `var` are **function scoped**. Whereas functions declared with `let` are **block scoped**. For example:

```
function testVar () {
  if(true) {
    var foo = 'foo';
  }

  console.log(foo);
}

testVar();
// logs 'foo'


function testLet () {
  if(true) {
    let bar = 'bar';
  }

  console.log(bar);
}

testLet();
// reference error
// bar is scoped to the block of the if statement
```

variables with `var`:

When the first function `testVar` gets called the variable foo, declared with `var`, is still accessible outside the `if` statement. This variable `foo` would be available **everywhere** within the scope of the `testVar` **function**.

variables with `let`:

When the second function `testLet` gets called the variable bar, declared with `let`, is only accessible inside the `if` statement. Because variables declared with `let` are **block scoped** (where a block is the code between curly brackets e.g `if{}` , `for{}`, `function{}`).

`let` variables don't get hoisted:

Another difference between `var` and `let` is variables with declared with `let` **don't get hoisted**. An example is the best way to illustrate this behavior:

variables with `let` **don't** get hoisted:

```
console.log(letVar);

let letVar = 10;
// referenceError, the variable doesn't get hoisted
```

Global `let` doesn't get attached to `window`:

A variable declared with `let` in the global scope (which is code that is not in a function) doesn't get added as a property on the global `window` object. For example (this code is in global scope):

```
var bar = 5;
let foo  = 10;

console.log(bar); // logs 5
console.log(foo); // logs 10

console.log(window.bar);
// logs 5, variable added to window object

console.log(window.foo);
// logs undefined, variable not added to window object
```

When should `let` be used over `var`?

Use `let` over `var` whenever you can because it is simply scoped more specific. This reduces potential naming conflicts which can occur when dealing with a large number of variables. `var` can be used when you want a global variable explicitly to be on the `window` object (always consider carefully if this is really necessary).

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edited Sep 10 '18 at 7:39
Suraj Rao
28.2k 10 88 94

answered Sep 9 '18 at 13:08
Willem van der Veen
20.3k 11 118 115

13

It also appears that, at least in Visual Studio 2015, TypeScript 1.5, "var" allows multiple declarations of the same variable name in a block, and "let" doesn't.

This won't generate a compile error:

```
var x = 1;
var x = 2;
```

This will:

```
let x = 1;
let x = 2;
```

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edited Nov 28 '16 at 9:31
John Slegers
38.7k 17 183 154

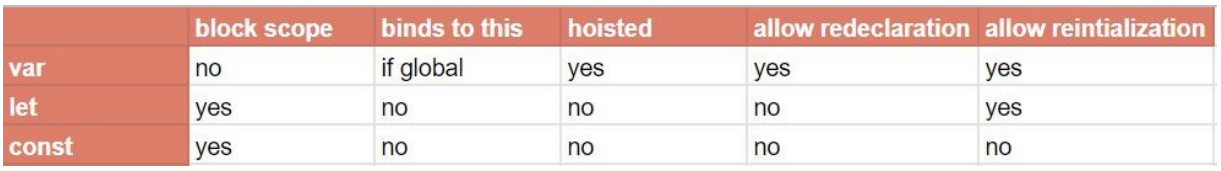
answered Aug 11 '15 at 0:35
RDoc
157 2 8

13

ES6 introduced two new keyword(**let** and **const**) alternate to **var**.

When you need a block level deceleration you can go with let and const instead of var.

The below table summarize the difference between var, let and const



	block scope	binds to this	hoisted	allow redeclaration	allow reintialization
var	no	if global	yes	yes	yes
let	yes	no	no	no	yes
const	yes	no	no	no	no

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edited Apr 13 at 18:50
TylerH
19.2k 50 65 86

answered Jan 26 '20 at 11:39
Srikrushna
2,751 30 37

2 The hoisted column is incorrect. They all hoist variable. The difference with `var` is that they hoist but do not initialize to the `undefined` value. If they did not hoist, they would not mask variables of the same name in enclosing blocks: stackoverflow.com/q/63337235/2326961 – Maggyero Aug 11 '20 at 9:43

12

`var` is global scope (hoist-able) variable.

`let` and `const` is block scope.

test.js

```
{
    let l = 'let';
    const c = 'const';
    var v = 'var';
    v2 = 'var 2';
}

console.log(v, this.v);
console.log(v2, this.v2);
console.log(l); // ReferenceError: l is not defined
console.log(c); // ReferenceError: c is not defined
```

Run code snippet   Expand snippet

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answered Oct 28 '17 at 12:42
Moslem Shahsavan
906 10 17

10

When Using `let`

The `let` keyword attaches the variable declaration to the scope of whatever block (commonly a `{ .. }` pair) it's contained in. In other words, `let` implicitly hijacks any block's scope for its variable declaration.

`let` variables cannot be accessed in the `window` object because they cannot be globally accessed.

```
function a(){
    { // this is the Max Scope for let variable
        let x = 12;
    }
    console.log(x);
}
a(); // Uncaught ReferenceError: x is not defined
```

When Using `var`

`var` and variables in ES5 has scopes in functions meaning the variables are valid within the function and not outside the function itself.

`var` variables can be accessed in the `window` object because they cannot be globally accessed.

```
function a(){ // this is the Max Scope for var variable
    {
        var x = 12;
    }
    console.log(x);
}
a(); // 12
```

If you want to know more continue reading below

one of the most famous interview questions on scope also can suffice the exact use of `let` and `var` as below;

When using `let`

```
for (let i = 0; i < 10 ; i++) {
    setTimeout(
        function a() {
            console.log(i); //print 0 to 9, that is literally AWW!!!
        },
        100 * i);
}
```

This is because when using `let`, for every loop iteration the variable is scoped and has its own copy.

```
        100 * i);
}
```

This is because when using `var`, for every loop iteration the variable is scoped and has shared copy.

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edited May 22 '18 at 13:22

answered May 22 '18 at 13:12
Ankur Soni
4,667 5 32 63

9

If I read the specs right then `let` **thankfully** can also be leveraged to avoid self invoking functions used to simulate private only members - *a popular design pattern that decreases code readability, complicates debugging, that adds no real code protection or other benefit - except maybe satisfying someone's desire for semantics, so stop using it. /rant*

```
var SomeConstructor;

{
    let privateScope = {};

    SomeConstructor = function SomeConstructor () {
        this.someProperty = "foo";
        privateScope.hiddenProperty = "bar";
    }

    SomeConstructor.prototype.showPublic = function () {
        console.log(this.someProperty); // foo
    }

    SomeConstructor.prototype.showPrivate = function () {
        console.log(privateScope.hiddenProperty); // bar
    }

}

var myInstance = new SomeConstructor();

myInstance.showPublic();
myInstance.showPrivate();

console.log(privateScope.hiddenProperty); // error
```

See 'Emulating private interfaces'

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edited Jan 12 '19 at 5:29

answered Oct 14 '16 at 5:01
Daniel Sokolowski
10.6k 3 61 50

Can you elaborate on how Immediately Invoked Function Expressions do not provide “code protection” and `let` does? (I assume you mean IIFE with “self invoking function”.) – Robert Siemer Mar 1 '20 at 3:58

And why do you set `hiddenProperty` in the constructor? There is only one `hiddenProperty` for all instances in your “class”. – Robert Siemer Mar 1 '20 at 12:52

7

Some hacks with `let`:

1.

```
let statistics = [16, 170, 10];
let [age, height, grade] = statistics;

console.log(height)
```

2.

```
let x = 120,
y = 12;
[x, y] = [y, x];
console.log(`x: ${x} y: ${y}`);
```

3.

```
let node = {
               type: "Identifier",
               name: "foo"
           };

let { type, name, value } = node;

console.log(type);      // "Identifier"
console.log(name);      // "foo"
console.log(value);     // undefined

let node = {
    type: "Identifier"
};

let { type: localType, name: localName = "bar" } = node;

console.log(localType);     // "Identifier"
console.log(localName);     // "bar"
```

Getter and setter with `let`:

```
let jar = {
    numberOfCookies: 10,
    get cookies() {
        return this.numberOfCookies;
    },
    set cookies(value) {
        this.numberOfCookies = value;
    }
};

console.log(jar.cookies)
jar.cookies = 7;

console.log(jar.cookies)
```

please what do this mean `let { type, name, value } = node;` ? you create a new object with 3 properties type/name/value and initialise them with the properties values from node ? – AlainIb Jun 15 '17 at 7:55

In example 3 you are re-declaring node which cause exception. These all examples also work perfectly with `var` too. – Rehan Haider Jan 9 '19 at 10:57

This doesn't answer the question; it could benefit from an explanation as to what each block of code is doing. – TylerH Apr 13 at 18:50

7

The below shows how 'let' and 'var' are different in the scope:

```
let gfoo = 123;
if (true) {
    let gfoo = 456;
}
console.log(gfoo); // 123

var hfoo = 123;
if (true) {
    var hfoo = 456;
}
console.log(hfoo); // 456
```

The `gfoo`, defined by `let` initially is in the **global scope**, and when we declare `gfoo` again inside the `if clause` its ***scope changed*** and when a new value is assigned to the variable inside that scope it **does not affect** the global scope.

Whereas `hfoo`, defined by `var` is initially in the **global scope**, but again when we declare it inside the `if clause`, it considers the global scope hfoo, although var has been used again to declare it. And when we re-assign its value we see that the global scope hfoo is also affected. This is the primary difference.

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answered Sep 7 '19 at 11:25

Piklu Dey

200 1 13

6

let is a part of es6. These functions will explain the difference in easy way.

```
function varTest() {
  var x = 1;
  if (true) {
    var x = 2;  // same variable!
    console.log(x);  // 2
  }
  console.log(x);  // 2
}

function letTest() {
  let x = 1;
  if (true) {
    let x = 2;  // different variable
    console.log(x);  // 2
  }
  console.log(x);  // 1
}
```

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answered Dec 17 '17 at 10:47

Vipul Jain
104 1 4

5

let vs var. It's all about **scope**.

var variables are global and can be accessed basically everywhere, while **let variables are not global** and only exist until a closing parenthesis kills them.

See my example below, and note how the lion (let) variable acts differently in the two console.logs; it becomes out of scope in the 2nd console.log.

```
var cat = "cat";
let dog = "dog";

var animals = () => {
    var giraffe = "giraffe";
    let lion = "lion";

    console.log(cat);  //will print 'cat'.
    console.log(dog);  //will print 'dog', because dog was declared outside this
function (like var cat).

    console.log(giraffe); //will print 'giraffe'.
    console.log(lion); //will print 'lion', as lion is within scope.
}

console.log(giraffe); //will print 'giraffe', as giraffe is a global variable (var).
console.log(lion); //will print UNDEFINED, as lion is a 'let' variable and is now out
of scope.
```

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answered Apr 18 '19 at 0:49
daCoda
2,522 4 24 32

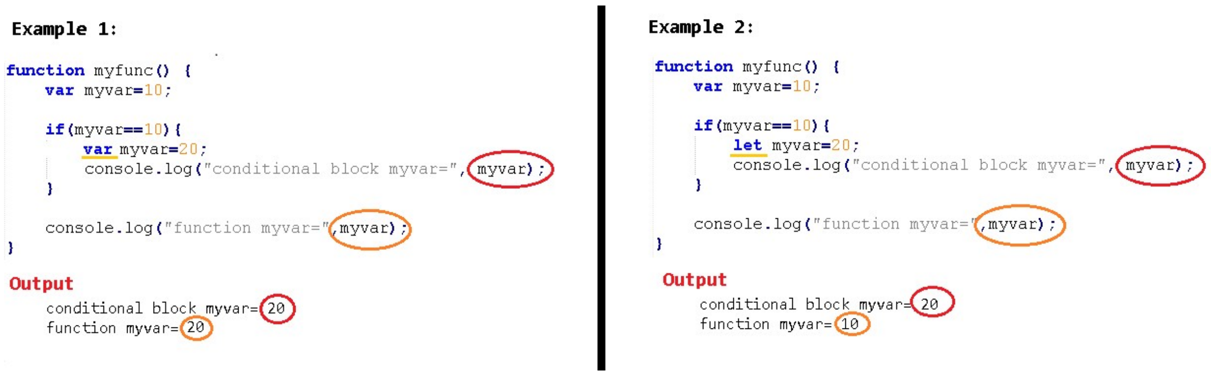
4

As mentioned above:

> The difference is scoping. `var` is scoped to the nearest **function block** and `let` is scoped to the **nearest enclosing block**, which can be smaller than a function block. Both are global if outside any block.Lets see an example:

Example1:

In my both examples I have a function `myfunc`. `myfunc` contains a variable `myvar` equals to 10. In my first example I check if `myvar` equals to 10 (`myvar==10`) . If yes, I agian declare a variable `myvar` (now I have two myvar variables)using `var` keyword and assign it a new value (20). In next line I print its value on my console. After the conditional block I again print the value of `myvar` on my console. If you look at the output of `myfunc`, `myvar` has value equals to 20.



Example 1:

```
function myfunc() {
    var myvar=10;

    if(myvar==10){
        var myvar=20;
        console.log("conditional block myvar=",myvar);
    }

    console.log("function myvar=",myvar);
}
```

Output

```
    conditional block myvar=20
    function myvar=20
```

Example 2:

```
function myfunc() {
    var myvar=10;

    if(myvar==10){
        let myvar=20;
        console.log("conditional block myvar=",myvar);
    }

    console.log("function myvar=",myvar);
}
```

Output

```
    conditional block myvar=20
    function myvar=10
```

Example2: In my second example instead of using `var` keyword in my conditional block I declare `myvar` using `let` keyword . Now when I call `myfunc` I get two different outputs: `myvar=20` and `myvar=10`.

So the difference is very simple i.e its scope.

Share Improve this answer Follow edited Aug 13 '18 at 14:02 answered Aug 7 '18 at 10:25

N Randhawa
6,519 2 40 45

4 Please don't post pictures of code, it's considered bad practice on SO as it will not be searchable for future users (as well as accessibility concerns). As well, this answer adds nothing that other answers haven't already addressed. – inostia Aug 24 '18 at 17:29

3

I want to link these keywords to the Execution Context, because the Execution Context is important in all of this. The Execution Context has two phases: a Creation Phase and Execution Phase. In addition, each Execution Context has a Variable Environment and Outer Environment (its Lexical Environment).

During the Creation Phase of an Execution Context, var, let and const will still store its variable in memory with an undefined value in the Variable Environment of the given Execution Context. The difference is in the Execution Phase. If you use reference a variable defined with var before it is assigned a value, it will just be undefined. No exception will be raised.

However, you cannot reference the variable declared with let or const until it is declared. If you try to use it before it is declared, then an exception will be raised during the Execution Phase of the Execution Context. Now the variable will still be in memory, courtesy of the Creation Phase of the Execution Context, but the Engine will not allow you to use it:

```
function a(){
    b;
    let b;
}
a();
> Uncaught ReferenceError: b is not defined
```

With a variable defined with var, if the Engine cannot find the variable in the current Execution Context's Variable Environment, then it will go up the scope chain (the Outer Environment) and check the Outer Environment's Variable Environment for the variable. If it cannot find it there, it will continue searching the Scope Chain. This is not the case with let and const.

The second feature of let is it introduces block scope. Blocks are defined by curly braces. Examples include function blocks, if blocks, for blocks, etc. When you declare a variable with let inside of a block, the variable is only available inside of the block. In fact, each time the block is run, such as within a for loop, it will create a new variable in memory.

ES6 also introduces the const keyword for declaring variables. const is also block scoped. The difference between let and const is that const variables need to be declared using an initializer, or it will generate an error.

And, finally, when it comes to the Execution Context, variables defined with var will be attached to the 'this' object. In the global Execution Context, that will be the window object in browsers. This is not the case for let or const.

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answered Feb 13 '19 at 16:07
Donato
6,078 7 41 76

3

As I am currently trying to get an in depth understanding of JavaScript I will share my brief research which contains some of the great pieces already discussed plus some other details in a different perspective.

Understanding the difference between **var** and **let** can be easier if we understand the difference between *function* and *block scope*.

Let's consider the following cases:

```
(function timer() {
    for(var i = 0; i <= 5; i++) {
        setTimeout(function notime() { console.log(i); }, i * 1000);
    }
})();


   Stack            VariableEnvironment //one VariablEnvironment for timer();
                                       // when the timer is out - the value will be the
same value for each call
5. [setTimeout, i]  [i=5]
4. [setTimeout, i]
3. [setTimeout, i]
2. [setTimeout, i]
1. [setTimeout, i]
0. [setTimeout, i]

####################

(function timer() {
    for (let i = 0; i <= 5; i++) {
        setTimeout(function notime() { console.log(i); }, i * 1000);
    }
})();

   Stack           LexicalEnvironment - each iteration has a new lexical environment
5. [setTimeout, i]  [i=5]
                      LexicalEnvironment
4. [setTimeout, i]    [i=4]
                        LexicalEnvironment
3. [setTimeout, i]      [i=3]
                         LexicalEnvironment
2. [setTimeout, i]       [i=2]
                           LexicalEnvironment
1. [setTimeout, i]         [i=1]
                             LexicalEnvironment
0. [setTimeout, i]           [i=0]
```

when `timer()` gets called an **ExecutionContext** is created which will contain both the **VariableEnvironment** and all the **LexicalEnvironments** corresponding to each iteration.

And a simpler example

Function Scope

```
function test() {
    for(var z = 0; z < 69; z++) {
        //todo
```

```
function test() {
    for(let z = 0; z < 69; z++) {
        //todo
    }
    //z is not defined :(
}
```

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edited May 7 '19 at 22:47

answered Mar 11 '19 at 16:52
Lucian Nut
507 1 6 18

3

I just came across one use case that I had to use `var` over `let` to introduce new variable. Here's a case:

I want to create a new variable with dynamic variable names.

```
let variableName = 'a';
eval("let " + variableName + '= 10;');
console.log(a);   // this doesn't work
```

```
var variableName = 'a';
eval("var " + variableName + '= 10;');
console.log(a);   // this works
```

The above code doesn't work because `eval` introduces a new block of code. The declaration using `var` will declare a variable outside of this block of code since `var` declares a variable in the function scope.

`let`, on the other hand, declares a variable in a block scope. So, `a` variable will only be visible in `eval` block.

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edited Dec 30 '20 at 20:05
Ashish Kamble
1,554 2 18 24

answered Oct 25 '20 at 17:15
Sarvar Nishonboyev
9,008 7 56 55

When will you ever have to create a dynamic variable name, and have to access it later? It is so much better to create an object and assign keys and values to it. – typeof null is object Nov 9 '20 at 19:18

2

Now I think there is better scoping of variables to a block of statements using `let`:

```
function printnums()
{
    // i is not accessible here
    for(let i = 0; i <10; i+=)
    {
       console.log(i);
    }
    // i is not accessible here

    // j is accessible here
    for(var j = 0; j <10; j++)
    {
       console.log(j);
    }
    // j is accessible here
}
```

I think people will start using let here after so that they will have similar scoping in JavaScript like other languages, Java, C#, etc.

People with not a clear understanding about scoping in JavaScript used to make the mistake earlier.

Hoisting is not supported using `let`.

With this approach errors present in JavaScript are getting removed.

Refer to *ES6 In Depth: let and const* to understand it better.

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edited Nov 26 '16 at 16:33
Peter Mortensen
28.5k 21 95 123

answered Jul 1 '16 at 8:22
swaraj patil
201 2 5

For in depth understanding on it refer link - davidwalsh.name/for-and-against-let – swaraj patil Jul 1 '16 at 8:27

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