



ES6

ECMA-262

# EcmaScript 6

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# History

- JavaScript: Implementation
- EcmaScript: Specification
- Netscape JavaScript ve Microsoft JScript, ActionScript
- ECMA standard organization project no. 262
- TC-39: Technical Committee 39

# History

- ES 3: 1999
- ES 4: Abandoned
- ES 5 : 2009 and 5.1: 2011
  - 258 pages
- ES 6: Draft renamey
  - 657 pages
  - ETA Haziran 2015
  - Harmony
- ES 7: Alrenamey in progres

# kangax's ES compat table

Compilers/polyfills							Desktop browsers																		
64%	76%	28%	32%	15%	9%	21%	3%	15%	69%	41%	65%	67%	68%	68%	31%	45%	45%	47%	5%	20%	23%	5%	6%	5%	
Traceur	Babel + core-js <sup>[1]</sup>	ES6 Transpiler	Closure	JSX <sup>[2]</sup>	TypeScript	es6-shim	IE 10	IE 11	IE Technical Preview <sup>[3]</sup>	FF 31 ESR	FF 36	FF 37	FF 38	FF 39	CH 40, OP 27 <sup>[4]</sup>	CH 41, OP 28 <sup>[4]</sup>	CH 42, OP 29 <sup>[4]</sup>	CH 43, OP 30 <sup>[4]</sup>	SF 6.1, SF 7	SF 7.1, SF 8	WK	OP 12	KQ 4.14 <sup>[5]</sup>	PJS	
0/2	1/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	
3/6	5/6	3/6	4/6	0/6	3/6	0/6	0/6	0/6	0/6	3/6	3/6	3/6	3/6	3/6	0/6	0/6	0/6	0/6	0/6	0/6	0/6	0/6	0/6	0/6	
4/5	3/5	2/5	2/5	3/5	3/5	0/5	0/5	0/5	4/5	3/5	3/5	3/5	4/5	4/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5	
10/10	10/10	6/10	2/10	0/10	0/10	0/10	0/10	0/10	4/10	8/10	10/10	10/10	10/10	10/10	0/10	0/10	0/10	0/10	0/10	2/10	2/10	0/10	0/10	0/10	
5/5	5/5	5/5	4/5	2/5	2/5	0/5	0/5	0/5	5/5	0/5	5/5	5/5	5/5	5/5	0/5	0/5	0/5	2/5	0/5	1/5	1/5	0/5	0/5	0/5	
5/5	5/5	3/5	4/5	0/5	0/5	0/5	0/5	0/5	5/5	4/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	0/5	1/5	1/5	0/5	0/5	0/5	
2/4	4/4	2/4	2/4	0/4	2/4	0/4	0/4	0/4	2/4	2/4	4/4	4/4	4/4	4/4	0/4	4/4	4/4	4/4	0/4	0/4	0/4	0/4	0/4	0/4	
2/2	2/2	2/2	2/2	2/2	1/2	0/2	0/2	0/2	1/2	0/2	2/2	2/2	2/2	2/2	0/2	2/2	2/2	2/2	0/2	0/2	0/2	0/2	0/2	0/2	
1/2	1/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	1/2	1/2	1/2	1/2	1/2	1/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	
22/26	23/26	17/26	14/26	9/26	0/26	0/26	0/26	0/26	0/26	14/26	19/26	19/26	19/26	19/26	0/26	0/26	0/26	0/26	0/26	13/26	14/26	0/26	0/26	0/26	
1/2	1/2	1/2	1/2	0/2	0/2	0/2	0/2	0/2	2/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	
6/8	6/8	6/8	6/8	1/8	0/8	0/8	0/8	8/8	8/8	3/8	8/8	8/8	8/8	8/8	1/8	5/8	5/8	5/8	1/8	1/8	1/8	1/8	2/8	1/8	
8/10	8/10	6/10	8/10	0/10	0/10	0/10	0/10	8/10	8/10	0/10	0/10	0/10	0/10	0/10	0/10	5/10	5/10	5/10	0/10	0/10	0/10	0/10	0/10	0/10	
Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	Flag	Yes	Yes	Yes	No	No	No	No	No	No	
9/11	9/11	7/11	8/11	7/11	6/11	0/11	0/11	0/11	10/11	7/11	7/11	7/11	7/11	7/11	0/11	0/11	0/11	0/11	0/11	0/11	0/11	0/11	0/11	0/11	
13/19	16/19	13/19	7/19	11/19	0/19	0/19	0/19	0/19	16/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19	
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14/14	13/14	0/14	10/14	0/14	0/14	0/14	0/14	0/14	0/14	10/14	13/14	13/14	14/14	14/14	11/14	11/14	11/14	12/14	0/14	0/14	0/14	0/14	0/14	0/14	
0/40	0/40	0/40	0/40	0/40	0/40	0/40	16/40	16/40	40/40	18/40	19/40	33/40	36/40	39/40	21/40	21/40	21/40	21/40	18/40	18/40	18/40	18/40	8/40	18/40	
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10/11	11/11	0/11	0/11	0/11	0/11	11/11	0/11	5/11	11/11	10/11	11/11	11/11	11/11	11/11	11/11	11/11	11/11	11/11	0/11	9/11	9/11	0/11	0/11	0/11	
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0/4	4/4	0/4	0/4	0/4	0/4	0/4	0/4	0/4	4/4	0/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	0/4	0/4	0/4	0/4	0/4	0/4	
0/20	0/20	0/20	0/20	0/20	0/20	0/20	0/20	0/20	17/20	12/20	14/20	16/20	17/20	17/20	0/20	0/20	0/20	0/20	0/20	0/20	0/20	0/20	0/20	0/20	
0/15	13/15	0/15	0/15	0/15	0/15	13/15	0/15	0/15	12/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	0/15	
3/3	3/3	0/3	0/3	0/3	0/3	3/3	0/3	0/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	0/3	3/3	3/3	0/3	0/3	0/3	
3/9	5/9	0/9	0/9	0/9	0/9	0/9	0/9	0/9	8/9	0/9	9/9	9/9	9/9	9/9	8/9	8/9	8/9	8/9	0/9	0/9	0/9	0/9	0/9	0/9	

# Overview

- Let vs Const keywords vs Var
- Changes in functions
- Changes in objects and destructuring
- Classes
- Template strings
- Promises

# Let and Const

- JS, looks like C or Java but no block scope
- Vars are function scoped
- Let ve Const block scoped

# Var and Let

Hoisting

```
function foo () {  
  var i;  
  console.log(i); undefined  
  
  for (var i = 0; i < 10; i++) {  
    console.log(i);  
  }  
  
  console.log(i); 10  
}
```

# Var ve Let

```
function foo () {
```

```
    console.log(i); // ERROR
```

```
    for (let i = 0; i < 10; i++) {
```

```
        console.log(i); // i only defined in this block
    }
```

```
    console.log(i); // ERROR
}
```



# Var and Let

```
function foo () {  
  
    console.log(i); // ERROR  
  
    for (let i = 0; i < 10; i++) {  
        console.log(i); // i snameece bu blokta tanımlı  
    }  
  
    console.log(i); // hata  
}
```

# Örnek

```
var links = document.getElementsByTagName('a')  
for (var i = 0, len = links.length; i < len; i++){  
    links[i].addEventListener('click', function(e){  
        alert('You clicked on link ' + i)  
    }, false)  
}
```

*DEMO*

*var\_problem.html*

# Solution

Enclose the var in a function

```
var links = document.getElementsByTagName('a')
```

```
for (var i = 0, len = links.length; i < len; i++){
```

```
  (function (j) {
```

```
    links[j].addEventListener('click', function(e){
```

```
      alert('You clicked on link ' + j)
```

```
    }, false)
```

```
  })(i);
```

```
}
```

*DEMO*

*var\_cozum.html*

# Solution: Let

```
var links = document.getElementsByTagName('a')  
for (let i = 0, len = links.length; i < len; i++){  
    links[i].addEventListener('click', function(e){  
        alert('You clicked on link ' + i)  
    }, false)  
}
```

*DEMO*  
*let\_cozum.html*

# Const

```
const PI = 3.14;
```

```
PI = 3; // ERROR
```

Better to have values than variables for less bugs

*DEMO*  
*let\_const.js*

# Changes in Functions

- Default parameters function `foo(name="Ustun")`
- Rest parameters function `foo(name, ...rest)`
- Destructured parameters function `foo({name, surname})`

# Default Params

```
function hello(name="Ustun", greeting="Hello") {  
    console.log(greeting + " " + name);  
}
```

```
hello();
```

```
hello("Ahmet");
```

```
hello("Mehmet", "Hola");
```

Not keyword params like in Python!

~~hello(greeting="Hello",  
name="Ozgur")~~

*DEMO*

*functions\_default\_params.js*

# Rest params

```
function sum(firstValue, ...rest) {  
  var total = firstValue;  
  for (var i = 0; i < rest.length; i++) {  
    total += rest[i];  
  }  
  return total;  
}
```

sum(15, 1, 2, 3);

rest = [1, 2, 3]

*DEMO*

*functions\_rest\_params.js*



# Parameter Destructuring

```
function hello(name, options) {  
    var greeting;  
    var lang = options.lang;  
    if (lang == "en") greeting = "Hello";  
    if (lang == "es") greeting = "Hola";  
    return greeting + " " + name;  
}
```

```
function hello(name, {lang}) {  
    var greeting;  
    if (lang == "en") greeting = "Hello";  
    if (lang == "es") greeting = "Hola";  
    return greeting + " " + name;  
}
```

*DEMO*

*functions\_param\_destructuring.js*

```
function setCookie(name, value, options) {
```

```
    options = options || {};
```

```
    var secure = options.secure,  
        path = options.path,  
        domain = options.domain,  
        expires = options.expires;
```

```
    // ...
```

```
}
```

```
setCookie("type", "js", {  
    secure: true,  
    expires: 60000  
});
```

```
function setCookie(name, value, { secure, path, domain, expires }) {
```

```
    // ...
```

```
}
```

# Sprename operator

- `Math.max(1, 2, 3); 3`
- `Math.max([1, 2, 3]); // NaN`
- `var a = [1, 2, 3]; Math.max(a); // NaN`
- `Math.max.apply(Math, a); // 3`
- `Math.max(...a); // 3`



# Arrow functions

```
var bar = (a, b) => a + b;
```

```
var foo = function (a,b) {
```

```
  return a + b; }
```

```
foo(1,2) ; // 3
```

```
bar(1,2); // 3
```

- `var nums = [1, 2, 3, 4];`
- `nums.filter(x => x % 2 === 1)`
- `nums.reduce((a,b) => a * b)`

*DEMO*  
*arrow\_functions.js*

# Arrow functions and this keyword

```
var x = {  
  name: "Ustun",  
  hello: function () {  
    var that = this;  
    var helper = function () {  
      console.log("Name ", this.name);  
    };  
    helper();  
  }  
};  
x.hello()
```

that

**this refers to the value where function is defined,  
not called  
(lexical scope vs dynamic scope)**

```
var x = {  
  name: "Ustun",  
  hello: function () {  
    var helper = () => {  
      console.log("Nameim ", this.name);  
    };  
    helper();  
  }  
};  
x.hello()
```

*DEMO*  
*this.js*

# Changes in Objects



# Destructuring

```
var ustun = {name: "Ustun", lastname: "Ozgur"}
```

```
var name = ustun.name;
```

```
var lastname = ustun.lastname;
```

```
var {name, lastname} = {name: "Ustun", lastname: "Ozgur"}
```

```
var {name: isim} = ustun;
```

# Destructuring

- Array destructuring
- `var [a,b] = [1,2];`
- `var [a,b] = [b,a]; // Swap`
- Deep destructuring possible

# Shorthand for Object Creation

```
age = 30; name = "Ustun"; location = "Turkey";
```

```
ustun = {name: name, age: age, location: location};
```

```
age = 45; name = "Jose"; location = "Barcelona";
```

```
ahmet = {name, age, location};
```

*DEMO*  
*objects.js*

# Shorthand for Object Creation

```
var ustun = {  
  
  name: "Ustun",  
  
  sayName: function () {  
    console.log("I'm " + this.name);  
  }  
}
```

```
var ustun = {  
  
  name: "Ustun",  
  
  sayName() {  
    console.log("I'm " + this.name);  
  }  
}
```

# Computed Properties

<code>var fieldName = "firstName";</code>	<code>a.fieldName == "ustun"</code>
<code>var a = {</code>	<code>a.firstName ? undefined</code>
<code>  fieldName: "ustun";</code>	<code>a[fieldName] = "ustun";</code>
<code>}</code>	<code>a.firstName == "ustun"</code>
 <code>var a = {</code>	
<code>  [fieldName]: "ustun";</code>	
<code>}</code>	

# Template Strings

```
name = "Ustun", age = 30;
```

```
console.log("I'm " + name + ".Yasim " + age);
```

```
console.log(`I'm ${name}. My age ${age}`);
```

```
console.log(`This spans
```

```
multiple lines`);
```

# Tagged Template Strings

- `functionName`Hello ${name}`;`
- `safe`Hello ${name}`;`
- `uppercase`Hello ${name}`;`
- `var safe = function (literals, ...variables) { ...}`
- `var uppercase = function (literals, ...variables) { ...}`

# Class Keyword

- class and extends
- constructor
- transpiled to prototypes



# Class Kelimesi

*DEMO*

# Promises

```
student = findStudent(123)
```

```
className = findClass(student)
```

```
school = findSchool(className)
```

# Callbacks & Pyramid of Doom

```
student = findStudent(123, function (student) {  
  findClass(student, function (className) {  
    findSchool(className, function (school) {  
      console.log(school);  
    })  
  })  
})
```

# Pyramid of Doom Sol'n

```
findStudent(123)
```

```
.then(findClass)
```

```
.then(findSchool)
```

```
.then(function (school) {console.log(school);})
```

```
.catch(function () { console.log("error")})
```

# Promise

- `new Promise(resolve, reject)`
- `Promise.all([promise1, promise2]).then`
- `Promise.race([promise1, promise2]).then`

*DEMO*

# Modules

- `import myfunc from mylib;`
- `export myfunc;`

# List Comprehensions

- `var x = [for (i of [0, 1, 2, 3]) i * i];`
- `[ 0, 1, 4, 9 ]`
- `var y = [for (i of [0, 1, 2, 3]) if (i % 2 === 0) i * i * i];`
- `[ 0, 8 ]`

# Babel.js

- Transpiler
- `babel source.js > destination.js`
- `babel --experimental source.js`
- `require('babel/polyfill')`



# More Info

- Wiki: <http://wiki.ecmascript.org/>
- Understanding ECMAScript 6
  - <https://leanpub.com/understandings6/>
- Taslaklar: [http://wiki.ecmascript.org/doku.php?id=harmony:specification\\_drafts](http://wiki.ecmascript.org/doku.php?id=harmony:specification_drafts)
- [babeljs.io](http://babeljs.io)
- <https://github.com/lukehoban/es6features>
- <http://kangax.github.io/compat-table/es6/>