



ES6

ECMA-262

EcmaScript 6

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sellercrowd

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 ready
 - 657 pages
 - ETA June 2015
 - Harmony
- ES 7: Already in progress

kangax's ES6 compatibility 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 ^[1] | ES6 Transpiler | Closure | JSX ^[2] | TypeScript | es6-shim | IE 10 | IE 11 | IE Technical Preview ^[3] | FF 31 ESR | FF 36 | FF 37 | FF 38 | FF 39 | CH 40, OP 27 ^[4] | CH 41, OP 28 ^[4] | CH 42, OP 29 ^[4] | CH 43, OP 30 ^[4] | SF 6.1, SF 7 | SF 7.1, SF 8 | WK | OP 12 | KQ 4.14 ^[5] | PJS | | | |
| 1/2 | 0 | 0 | 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 | | | |
| 5/6 | 5 | 5 | 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 | | | |
| 3/5 | 2 | 2 | 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 | 6 | 6 | 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 | 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 | 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 | | | |
| 4/4 | 2 | 2 | 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 | 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 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23/26 | 17 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6/8 | 6 | 6 | 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 | 6 | 6 | 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 | 1 | 1 | Yes | No | No | No | No | Yes | Yes | No | No | No | No | No | Flag | Yes | Yes | Yes | No | No | No | No | No | No | | | |
| 9/11 | 7 | 7 | 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 | | | |
| 16/19 | 13 | 13 | 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 | | | |
| 4/4 | 4 | 4 | 3/4 | 4/4 | 0/4 | 0/4 | 0/4 | 0/4 | 4/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | 0/4 | | | |
| 13/14 | 0 | 0 | 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 | 0 | 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 | | | |
| 11/11 | 0 | 0 | 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 | | | |
| 11/11 | 0 | 0 | 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 | | | |
| 5/5 | 0 | 0 | 0/5 | 0/5 | 0/5 | 0/5 | 0/5 | 2/5 | 5/5 | 3/5 | 5/5 | 5/5 | 5/5 | 5/5 | 5/5 | 5/5 | 5/5 | 5/5 | 0/5 | 4/5 | 4/5 | 0/5 | 0/5 | 0/5 | | | |
| 4/4 | 0 | 0 | 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 | 0 | 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 | | | |
| 13/15 | 0 | 0 | 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 | 0 | 0 | 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 | | | |
| 0/9 | 0 | 0 | 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 | | | |

Most features now usable via Babeljs transpiler, even in old browsers

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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 due to curly brace blocks
 - but no block scope
- Vars are function scoped
- Let ve Const block scoped
- Causes confusion for beginners

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 defined only in this block
    }
```

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


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

Spread 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`



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 }) {
```

```
    // ...
```

```
}
```

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

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

**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("Name ", 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: nombre} = 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);  
  }  
}
```

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

Classes

```
class Human {  
    constructor(name, age) {  
        this.name = name;  
        this.age = age;  
        this.party = null;  
    }  
}
```

```
class Ogresci extends Human {  
    constructor(name, age, school) {  
        super(name, age);  
        this.school = school;  
    }  
}
```

Other features

- Modules
- Promises
- Generators

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
- babeljs.io
- <https://github.com/lukehoban/es6features>
- <http://kangax.github.io/compat-table/es6/>

Thank you!

- @ustunozgur
- <https://github.com/ustun/ecmascript6-presentation>
- ustun@ustunozgur.com
- **NEXT WEEK: React.js talk at BarcelonaJS**

Extras

Example

```
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

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> | |

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]`

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;`