

ES2015 (ES 6) Exercises

JS & ECMAScript
2015 (ES6)

EX-0

Skim this [document](#), most of the examples below are taken from here. Use it as a “cheat sheet” for es2015.

EX1

Execute the examples from (1) related to *Constants* and *Scoping*. Make sure you understand and can explain block-scoped variables in relation to ES5 (var) scoping and hoisting.

In all the following exercises you should use *let-declarations*, unless you really have a reason for not doing so.

EX2

a1) Add the necessary (missing) code to make this [example](#) work:

a2) Why does this work?:

```
var odds = evens.map(v => v+1);
```

while this doesn't (fix the example below, without going back to the solution above)?

```
var odds = evens.map(v => {  
  v+1  
});
```

EX3 arrow functions and this

A)

For this exercise you should refer to this slide (<http://js-plaul.rhcloud.com/javascript1/js.html#19>) as a reference to ES5 *this*-pitfalls.

Use the Constructor function in the example below, to explain about the ES5 *this*-behaviour. Execute the example, and solve the problem, first using ES5 features, and then using an es2015 arrow function.

```
function Numbers(nums) {  
  
  this.nums = nums;  
  this.fives = [];  
  this.nums.forEach(function (v) {  
    if (v % 5 === 0) {  
      this.fives.push(v);  
    }  
  });  
}  
  
var numbers = new Numbers([1, 3, 5, 10, 14, 20, 33, 50]);  
console.log(numbers.fives);
```

B) Arrow functions and *this* or when not to use arrow functions

This example (taken from the slide referred to above), shows how we "lose" *this*, when extracting a method from an object.

```
var counter = {  
  count: 0,  
  inc: function () {  
    this.count++;  
  }  
}  
  
var func = counter.inc; //Store "reference" to inc  
func();  
console.log(counter.count); //Still zero  
counter.inc();  
console.log(counter.count); //Now one
```

Rewrite the `inc()` function to use the arrow notation, and test whether *this* solves the problem, makes it worse or leaves it unchanged.

Ref: [Do ES6 Arrow Functions Really Solve "this" In JavaScript?](#)

EX-4 Template literals

Execute this [example](#) And use template literals whenever it makes sense for all the following exercises.

EX-5 - Rest Parameter and the spread operator

A) Implement the function `f(...)` below:

```
function f(x,y,...rest){  
  ...  
}
```

So this statement:

```
console.log(f(5,2,true,2,"hello World",[1,2,3],new Date(),{}));
```

Will produce this output (should obviously work for any number/type of arguments):

```
Sum: 7  
rest value 1 is a: Boolean  
rest value 2 is a: Number  
rest value 3 is a: String  
rest value 4 is a: Array  
rest value 5 is a: Date  
rest value 6 is a: Object
```

Hint: With es2015 you can get the class name using this construct:

```
myinstance.constructor.name
```

B) Test the rest operator using the code below:

```
var rest = [true, 2, "hello World", [1, 2, 3], new Date(), {}];  
var restParams = [ ...rest];  
console.log(f(5, 2, ...restParams));
```

C) What will this line produce? `var chars = [... f(5, 2, ...restParams)];`

EX-6

Assuming we had these variables (for example passed in via a HTTP request):

```
let fName = "Kurt";  
let lName = "Wonnegut";  
let age = 98
```

Create an object, using the *Property Shorthand notation* with a *fName*, *lName* and *age* property.

EX7 Destructuring Assignment

A) Given these declarations: `let fName = "Kurt", lName = "Wonnegut";`

Implement a one-liner (using Array matching) to swap the two values so this statement:

```
console.log(`First: ${fName}, Last: ${lName}`);
```

Will print: First: Wonnegut, Last: Kurt

B) Given the method below

```
function getPerson() {  
  return {  
    firstName: "Kurt",  
    lastName: "Wonnegut",  
    gender : "Male",  
    email: "kurt@wonnegut.dk",  
    phone: "12345",  
  }  
}
```

Implement a one-liner (using the object matching shorthand notation) that will initialize (only) two variables `lastName` and `phone`.

EX-8 – ES2015 Modules

Rewrite the *f(..)* method from EX5 into a reusable es2015 module, and import the function into a new file and test.

Hint: Since you are using Node, Node will think of this as one of its own modules and look into *node_modules* for the module unless you do the usual *./myModule* for your own modules

EX9 Classes and Inheritance with es2015

A) The declaration below defines a Shape class, which as it's only properties has a `color` field + a `getArea()` and a `getPerimeter()` function which both returns undefined. This is the closest we get to an abstract method in Java.

```
class Shape {
  constructor(color) {
    this._color = color;
  }
  getArea() {
    return undefined;
  }
  getPerimeter() {
    return undefined;
  }
}
```

Provide the class with a nice (using template literals) `toString()` method + a getter/setter for the colour property. Test the class constructor, the getter/setter and the two methods.

B) Create a new class Circle that should extend the Shape class.

Provide the class with:

- A radius field
- A constructor that takes both colour and radius.
- Overwritten versions of the three methods defined in the Base
- Getter/Setter for radius

Test the class constructor, the getters/setters and the three methods.

C) Create a new class Cylinder (agreed, not a perfect inheritance example) that should extend the Circle class.

Provide the class with:

- A height field
- A constructor that takes colour, radius and height.
- Overwritten versions of the three methods defined in the Base (`getPerimeter()` should return undefined)
- A `getVolume()` method
- Getter/Setter for height

Test the new class

D) The `getX()` methods (`getArea()`, `getPerimeter()` and `getVolume()`) are all candidates for a getter.

Rewrite the three methods to use the getter syntax; that is `console.log(circle.radius)` instead of `console.log(circle.getRadius())`

EX10 - the iteration Protocols

Skim the [sections](#) related to Iteration Protocols and implement (and understand) the two examples from the slides:

http://js-plaul.rhcloud.com/es2015_typescript/es5VStypescript.html#8

EX11 Generators

A) Skim these sections related to Generators and implement a few of the simple examples:

- [Iterators and generators](#)
- [Generator](#)

B) Complete the Generator function below (it's not yet a generator function, what is missing)

```
function* makeNames() {  
  
    let firstNames = ["Lars", "Jan", "Ida", "Tine", "Thomas"];  
    let lastNames = ["Mortensen", "Peterson", "Obama", "Jensen", "Hansen"];  
  
}
```

So these statements

```
let index = 0;  
for(let name of makeNames()) {  
    console.log(name);  
    if(index++ === 50) {  
        break;  
    }  
}
```

Will produce 50 objects as sketched below:

```
{ firstName: 'Ida', lastName: 'Jensen' }  
{ firstName: 'Tine', lastName: 'Jensen' }  
{ firstName: 'Jan', lastName: 'Mortensen' }  
{ firstName: 'Lars', lastName: 'Jensen' }  
{ firstName: 'Lars', lastName: 'Peterson' }  
{ firstName: 'Tine', lastName: 'Peterson' }  
{ firstName: 'Ida', lastName: 'Peterson' }  
{ firstName: 'Tine', lastName: 'Peterson' }  
{ firstName: 'Jan', lastName: 'Obama' }  
{ firstName: 'Ida', lastName: 'Obama' }  
...
```