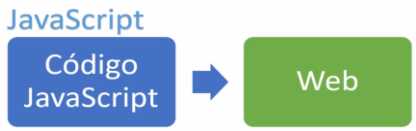
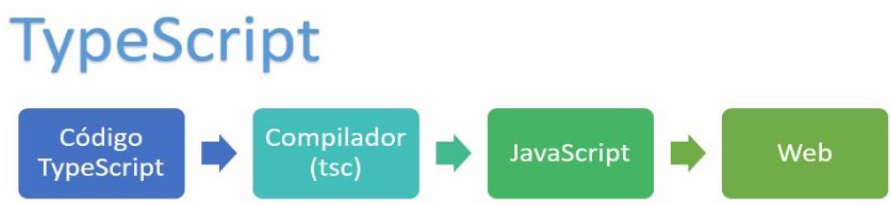
# TypeScript
## SYS4SOFT- João Ribeiro

https://www.youtube.com/watch?v=DF9jY0ITt3Q&list=PLXik_5Br-zO9SEz-3tuy1UIcU6X0GZo4i

Resumo do curso feito por Roberto Pinheiro

# Aula 02 - Instalação e fluxo de utilização do TypeScript




- Instale o Node JS.

- Posteriormente instale o TypeScript

npm install -g typescript

- entre com o comando:

tsc

```
C:\sites\vuejs-sys4soft
λ tsc
Version 3.7.4
Syntax:   tsc [options] [file...]

Examples: tsc hello.ts
          tsc --outFile file.js file.ts
          tsc @args.txt
          tsc --build tsconfig.json

Options:
 -h, --help                                         Print this message.
 -w, --watch                                        Watch input files.
 --pretty                                           Stylize errors and messages using color and context (experimental)
.
 --all                                              Show all compiler options.
 -v, --version                                      Print the compiler's version.
 --init                                             Initializes a TypeScript project and creates a tsconfig.json file.
 -p FILE OR DIRECTORY, --project FILE OR DIRECTORY  Compile the project given the path to its configuration file, or t
o a folder with a 'tsconfig.json'.
 -b, --build                                        Build one or more projects and their dependencies, if out of date
 -t VERSION, --target VERSION                       Specify ECMAScript target version: 'ES3' (default), 'ES5', 'ES2015
', 'ES2016', 'ES2017', 'ES2018', 'ES2019' or 'ESNEXT'.
 -m KIND, --module KIND                             Specify module code generation: 'none', 'commonjs', 'amd', 'system
', 'umd', 'es2015', or 'ESNext'.
 --lib                                              Specify library files to be included in the compilation.
                                                      'es5' 'es6' 'es2015' 'es7' 'es2016' 'es2017' 'es2018' 'es2019' '
es2020' 'esnext' 'dom' 'dom.iterable' 'webworker' 'webworker.importscripts' 'scripthost' 'es2015.core' 'es2015.collect
ion' 'es2015.generator' 'es2015.iterable' 'es2015.promise' 'es2015.proxy' 'es2015.reflect' 'es2015.symbol' 'es2015.sym
bol.wellknown' 'es2016.array.include' 'es2017.object' 'es2017.sharedmemory' 'es2017.string' 'es2017.intl' 'es2017.type
darrays' 'es2018.asyncgenerator' 'es2018.asynciterable' 'es2018.intl' 'es2018.promise' 'es2018.regexp' 'es2019.array'
'es2019.object' 'es2019.string' 'es2019.symbol' 'es2020.string' 'es2020.symbol.wellknown' 'esnext.array' 'esnext.symbo
l' 'esnext.asynciterable' 'esnext.intl' 'esnext.bigint'
 --allowJs                                          Allow javascript files to be compiled.
```

# Aula 04 - Typescript Basic Types - Parte 1

## aula-04\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Typescript Basic Types - 1</title>
</head>
<body>
    <p id="info"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

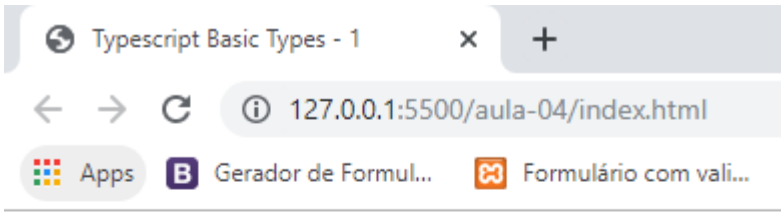
## aula-04\code.ts

```
function executar(){

    // string
    let valor1: string = "João";

    // boolean
    let valor2: boolean = true;

    // number
    let valor3: number = 23;
    let valor4: number = 16.5;
    let valor5: number = 0xA;
    let valor6: number = 0b1100100;
    let valor7: number = 0o144;

    // concatenando
    let primeiro_nome: string = "João";
    let nome_completo = `${primeiro_nome} Ribeiro`;

    // arrayx
    let nomes: string[] = ['João', 'Ana', 'Carlos'];
    let sobrenomes: Array<string> = ['Silva', 'Ribeiro', 'Oliveira'];

    let valor = "String: " + valor1 + "<br>Boolean: " + valor2 + "<br>Number1: " + valor3
    + "<br>Number2: " + valor4 + "<br>Number3: " + valor5 + "<br>Number4: " + valor6
    + "<br>Number5: " + valor7  + "<br>Nome completo: " + nome_completo
    + "<br>Array: " + `${nomes[0]} ${sobrenomes[1]}`;
    document.getElementById("info").innerHTML += valor;
}
```

tsc code

## aula-04\code.js

```
function executar() {
    // string
    var valor1 = "João";
    // boolean
    var valor2 = true;
    // number
    var valor3 = 23;
    var valor4 = 16.5;
    var valor5 = 0xA;
    var valor6 = 100;
    var valor7 = 100;
    // concatenando
    var primeiro_nome = "João";
    var nome_completo = primeiro_nome + " Ribeiro";
    // arrayx
    var nomes = ['João', 'Ana', 'Carlos'];
    var sobrenomes = ['Silva', 'Ribeiro', 'Oliveira'];
    var valor = "String: " + valor1 + "<br>Boolean: " + valor2 + "<br>Number1: " + valor3
        + "<br>Number2: " + valor4 + "<br>Number3: " + valor5 + "<br>Number4: " + valor6
        + "<br>Number5: " + valor7 + "<br>Nome completo: " + nome_completo
        + "<br>Array: " + (nomes[0] + " " + sobrenomes[1]);
    document.getElementById("info").innerHTML += valor;
}
```




String: João
Boolean: true
Number1: 23
Number2: 16.5
Number3: 10
Number4: 100
Number5: 100
Nome completo: João Ribeiro
Array: João Ribeiro

Executar

# Aula 05 - Typescript Basic Types - Parte 2

## aula-05\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Typescript Basic Types - 2</title>
</head>
<body>

    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <p id="info4"></p>
    <p id="info5"></p>
    <p id="info6"></p>
    <p id="info7"></p>
    <p id="info8"></p>

    <button type="button" onclick="executar()">Executar</button>

</body>
</html>
```

## aula-05\code.ts

```
function executar(){

    // tuple
    let dados: [string, number] = ['João', 43];

    // enum
    enum rgb {red=10, breen, blue};
    let cor: rgb = rgb.blue;
    let cor_nome: string = rgb[10];

    enum pontos {derrota=0, empate=1, vitoria=3};
    let resultado: pontos = pontos.vitoria;

    enum genero {masculino, feminino};
    let eu: genero = genero.masculino;

    // any
    let valor: any = 'João';
    valor = 43;

    let valor2: any[] = ['João', 43, false];
```

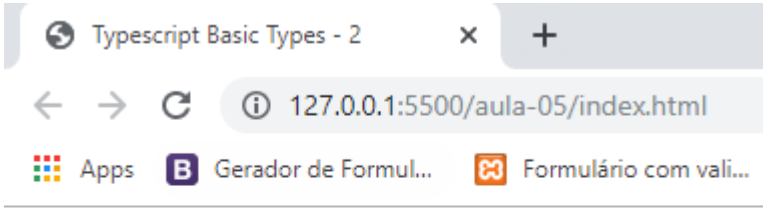
```
    valor2[0] = 2017;

    let nome = "João";
    let sobrenome = "Ribeiro";

    document.getElementById("info1").innerHTML = `${dados[0]} tem ${dados[1]} anos de idade.`;
    document.getElementById("info2").innerHTML = cor_nome;
    document.getElementById("info3").innerHTML = cor.toString();
    document.getElementById("info4").innerHTML = resultado.toString();
    document.getElementById("info5").innerHTML = eu.toString();
    document.getElementById("info6").innerHTML = valor;
    document.getElementById("info6").innerHTML = valor;
    document.getElementById("info7").innerHTML = valor2[0].toString();
    document.getElementById("info8").innerHTML = nome + " " + sobrenome;
}
```

tsc code

## aula-05\code.js

```
function executar() {
    // tuple
    var dados = ['João', 43];
    // enum
    var rgb;
    (function (rgb) {
        rgb[rgb["red"] = 10] = "red";
        rgb[rgb["breen"] = 11] = "breen";
        rgb[rgb["blue"] = 12] = "blue";
    })(rgb || (rgb = {}));
    ;
    var cor = rgb.blue;
    var cor_nome = rgb[10];
    var pontos;
    (function (pontos) {
        pontos[pontos["derrota"] = 0] = "derrota";
        pontos[pontos["empate"] = 1] = "empate";
        pontos[pontos["vitoria"] = 3] = "vitoria";
    })(pontos || (pontos = {}));
    ;
    var resultado = pontos.vitoria;
    var genero;
    (function (genero) {
        genero[genero["masculino"] = 0] = "masculino";
        genero[genero["feminino"] = 1] = "feminino";
    })(genero || (genero = {}));
    ;
    var eu = genero.masculino;
    // any
    var valor = 'João';
    valor = 43;
    var valor2 = ['João', 43, false];
    valor2[0] = 2017;
    var nome = "João";
```

```
    var sobrenome = "Ribeiro";
    document.getElementById("info1").innerHTML = dados[0] + " tem " + dados[1] + " anos de ida-
de.";
    document.getElementById("info2").innerHTML = cor_nome;
    document.getElementById("info3").innerHTML = cor.toString();
    document.getElementById("info4").innerHTML = resultado.toString();
    document.getElementById("info5").innerHTML = eu.toString();
    document.getElementById("info6").innerHTML = valor;
    document.getElementById("info6").innerHTML = valor;
    document.getElementById("info7").innerHTML = valor2[0].toString();
    document.getElementById("info8").innerHTML = nome + " " + sobrenome;
}
```




João tem 43 anos de idade.

red

12

3

0

43

2017

João Ribeiro

Executar

# Aula 06 - TypeScript destructuring

## aula-06\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>TypeScript destructuring</title>
</head>
<body>
    <p id="info"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

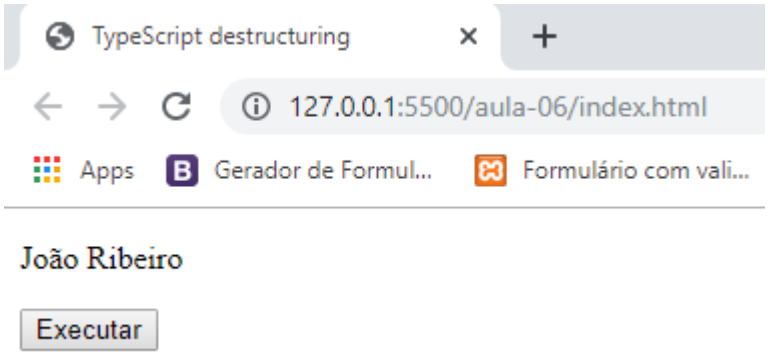
## aula-06\code.ts

```
function executar(): void{

    // destructuring
    let valores = ['João', 'Ribeiro'];
    let [nome, sobrenome] = valores;
    document.getElementById("info").innerHTML = teste(['João', 'Ribeiro']);
}

function teste([nome, sobrenome]: [string, string]): string{
    return `${nome} ${sobrenome}`;
}
```

tsc code

## aula-06\code.js

```
function executar() {
    // destructuring
    var valores = ['João', 'Ribeiro'];
    var nome = valores[0], sobrenome = valores[1];
    document.getElementById("info").innerHTML = teste(['João', 'Ribeiro']);
}
function teste(_a) {
    var nome = _a[0], sobrenome = _a[1];
    return nome + " " + sobrenome;
}
```




João Ribeiro

Executar

# Aula 07 - TypeScript spread

## aula-07\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>TypeScript spread</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

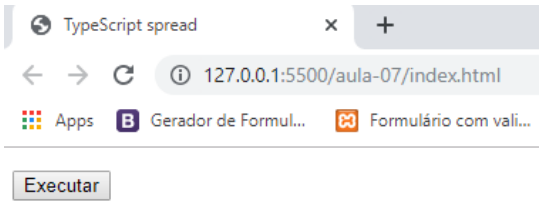
## aula-07\code.ts

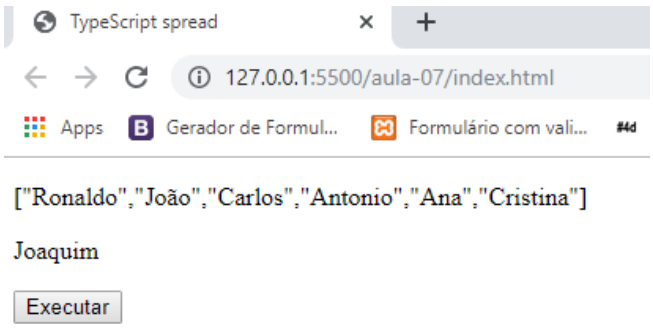
```
function executar(): void{

    // spread
    let nomes_1 = ['João', 'Carlos'];
    let nomes_2 = ['Ana', 'Cristina'];
    let nomes_totais = ['Ronaldo', ...nomes_1, 'Antonio', ...nomes_2];
    document.getElementById("info1").innerHTML = JSON.stringify(nomes_totais);

    let pessoa = {
        nome: "João",
        sobrenome: "Ribeiro",
        idade: 43
    };

    let nova_pessoa = {
        ...pessoa,
        nome: "Joaquim"
    };

    document.getElementById("info2").innerHTML = nova_pessoa.nome;

}
```

tsc code

## aula-07\code.js

```
var __assign = (this && this.__assign) || function () {
    __assign = Object.assign || function(t) {
        for (var s, i = 1, n = arguments.length; i < n; i++) {
            s = arguments[i];
            for (var p in s) if (Object.prototype.hasOwnProperty.call(s, p))
                t[p] = s[p];
        }
        return t;
    };
    return __assign.apply(this, arguments);
};
var __spreadArrays = (this && this.__spreadArrays) || function () {
    for (var s = 0, i = 0, il = arguments.length; i < il; i++) s += arguments[i].length;
    for (var r = Array(s), k = 0, i = 0; i < il; i++)
        for (var a = arguments[i], j = 0, jl = a.length; j < jl; j++, k++)
            r[k] = a[j];
    return r;
};
function executar() {
    // spread
    var nomes_1 = ['João', 'Carlos'];
    var nomes_2 = ['Ana', 'Cristina'];
    var nomes_totais = __spreadArrays(['Ronaldo'], nomes_1, ['Antonio'], nomes_2);
    document.getElementById("info1").innerHTML = JSON.stringify(nomes_totais);
    var pessoa = {
        nome: "João",
        sobrenome: "Ribeiro",
        idade: 43
    };
    var nova_pessoa = __assign(__assign({}, pessoa), { nome: "Joaquim" });
    document.getElementById("info2").innerHTML = nova_pessoa.nome;
}
```



# Aula 08 - Interfaces

## aula-08\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Interfaces</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-08\code.ts

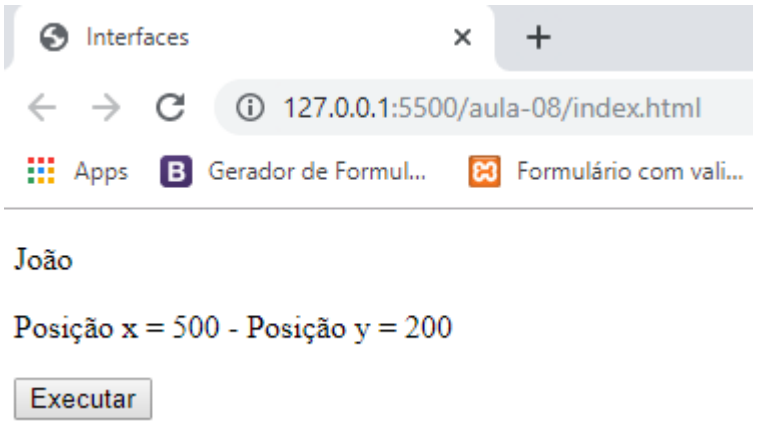
```
function executar(): void{

    // interfaces
    interface intPessoa {
        nome: string;
        sobrenome?: string;
    }

    interface intCoordenadas {
        x: number;
        readonly y: number;
    }

    function pessoa(dados: intPessoa){
        let final = '';
        if(dados.nome){
            final = dados.nome;
        }
        if(dados.sobrenome){
            final += " " + dados.sobrenome;
        }
        return final;
    }

    let d = {nome:'João'};
    let nome_completo = pessoa(d);

    let posicao: intCoordenadas = {x: 100, y: 200};
```

```
    posicao.x = 500;

    document.getElementById('info1').innerHTML = nome_completo;
    document.getElementById('info2').innerHTML = "Posição x = " + posicao.x + ' - Posição y = ' +
posicao.y;

}
```

tsc code

## aula-08\code.js

```
function executar() {
    function pessoa(dados) {
        var final = '';
        if (dados.nome) {
            final = dados.nome;
        }
        if (dados.sobrenome) {
            final += " " + dados.sobrenome;
        }
        return final;
    }
    var d = { nome: 'João' };
    var nome_completo = pessoa(d);
    var posicao = { x: 100, y: 200 };
    posicao.x = 500;
    document.getElementById('info1').innerHTML = nome_completo;
    document.getElementById('info2').innerHTML = "Posição x = " + posicao.x + ' - Posição y = ' +
posicao.y;
}
```



# Aula 09 - Classes

## aula-09\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Interfaces</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-09\code.ts

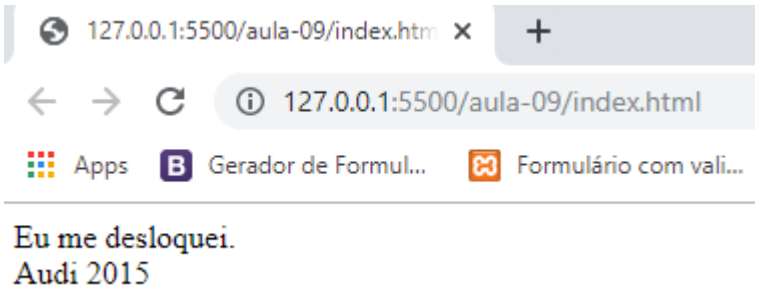
```
function executar(): void{

    // interfaces
    interface intPessoa {
        nome: string;
        sobrenome?: string;
    }

    interface intCoordenadas {
        x: number;
        readonly y: number;
    }

    function pessoa(dados: intPessoa){
        let final = '';
        if(dados.nome){
            final = dados.nome;
        }
        if(dados.sobrenome){
            final += " " + dados.sobrenome;
        }
        return final;
    }

    let d = {nome:'João'};
    let nome_completo = pessoa(d);

    let posicao: intCoordenadas = {x: 100, y: 200};
```

```
    posicao.x = 500;

    document.getElementById('info1').innerHTML = nome_completo;
    document.getElementById('info2').innerHTML = "Posição x = " + posicao.x + ' - Posição y = ' +
posicao.y;

}
```

tsc -w code.ts

## aula-09\code.js

```
function executar() {
    // classe
    var veiculo = /** @class */ (function () {
        function veiculo(m, a) {
            this.marca = m;
            this.ano = a;
        }
        veiculo.prototype.mover = function () {
            return "Eu me desloquei.";
        };
        return veiculo;
    }());
    var automovel = new veiculo('Audi', 2015);
    // automovel.ano = 2010;
    // automovel.marca = "BMW";
    document.write(automovel.mover());
    document.write("<br>");
    document.write(automovel.marca + " " + automovel.ano);
}
```



# Aula 10 - Classes - Hereditariedade

## aula-10\index.html

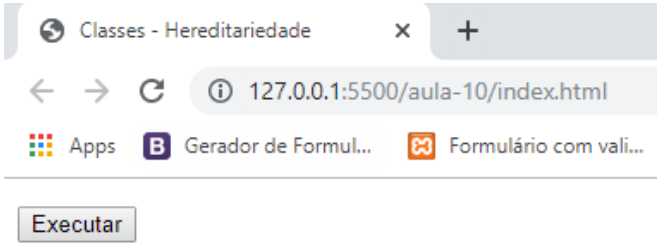
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Classes - Hereditariedade</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

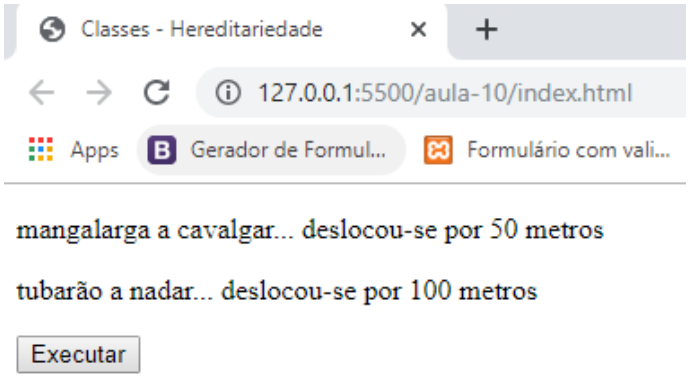
## aula-10\code.ts

```
function executar(){

    // classe - hereditariedade
    class animal{
        designacao: string;

        constructor(designacao: string){
            this.designacao = designacao;
        }

        mover(distancia: number): string{
            return `deslocou-se por ${distancia} metros`;
        }

    }

    class cavalo extends animal{

        mover(distancia: number): string{
            return `${this.designacao} a cavalgar... ` + super.mover(distancia);
        }
    }

    class peixe extends animal{

        mover(distancia: number): string{
            return `${this.designacao} a nadar... ` + super.mover(distancia);
        }
    }
```

```
    let c = new cavalo('mangalarga');
    let p = new peixe('tubarão');
    document.getElementById("info1").innerHTML = c.mover(50);
    document.getElementById("info2").innerHTML = p.mover(100);
}
```

tsc -w code.ts



# Aula 11 - Classes - Modificadores

## aula-11\index.html

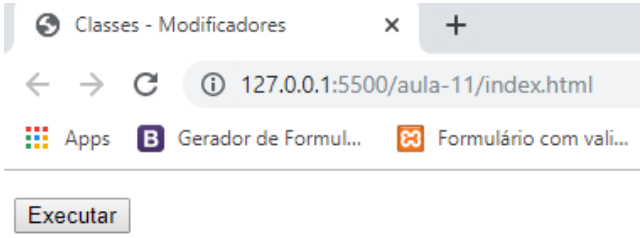
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Classes - Modificadores</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

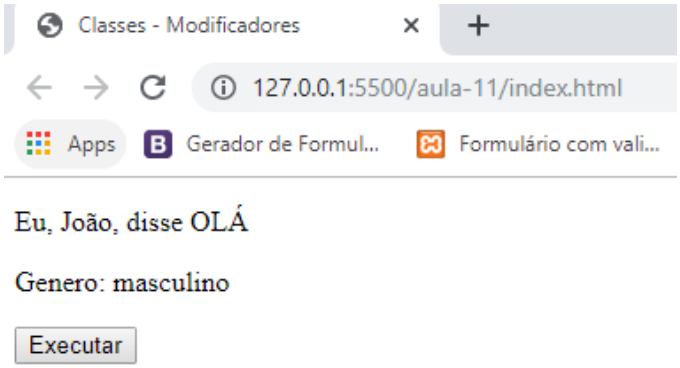
## aula-11\code.ts

```
function executar(){

    // classe - modifiers
    class humano{
        private nome: string;
        protected genero: string;

        constructor(n: string){
            this.nome = n;
        }

        setNome(n:string){
            this.nome = n;
        }

        getNome(){
            return this.nome;
        }

        private falar(texto: string){
            return `Eu, ` + this.nome + `, disse ` + texto;
        }

        public gritar(){
            return this.falar('OLÁ');
        }

    }
```

```
    class homem extends humano{

        setGenero(g:string){
            this.genero = g;
        }

        getGenero(){
            return this.genero;
        }

    }

    let pessoa = new humano('José');
    pessoa.setNome('João');
    let pn = pessoa.getNome();

    let h = new homem('João');
    h.setGenero('masculino');

    let g = h.getGenero();

    document.getElementById("info1").innerHTML = pessoa.gritar();
    document.getElementById("info2").innerHTML = "Genero: " + g;

}
```

tsc -w code.ts



# Aula 12 - Readonly e accessors

## aula-12\index.html

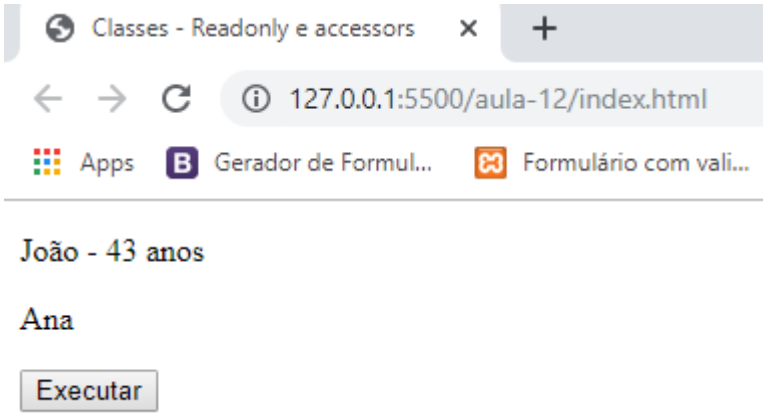
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Classes - Readonly e accessors</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-12\code.ts

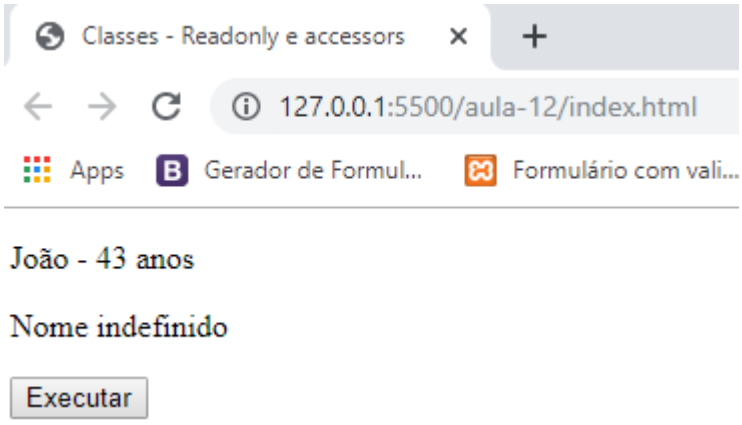
```
function executar(){

    // classe - readonly e accessors

    class homem {

        readonly nome: string;
        readonly idade: number;

        constructor(n: string, i: number){
            this.nome = n;
            this.idade = i;
        }

    }

    class mulher {
        private _nome: string;
        private _sobrenome: string;

        // setter

        set Nome(n: string){
            if(n != 'x'){
                this._nome = n;
            } else {
                this._nome = "Nome indefinido";
            }
        }
```

```
        // getter

        get Nome(){
            return this._nome;
        }

    }

    let h = new homem('João', 43);
    // h.nome = 'João';

    let m = new mulher();
    m.Nome = 'x';
    // m.Nome = 'Ana';

    document.getElementById("info1").innerHTML = h.nome + " - " + h.idade + " anos";
    document.getElementById("info2").innerHTML = m.Nome;

}
```

tsc -w code.ts




- Se nome de mulher é 'x':



# Aula 13 - Propriedade static e classes abstratas

## aula-13\index.html

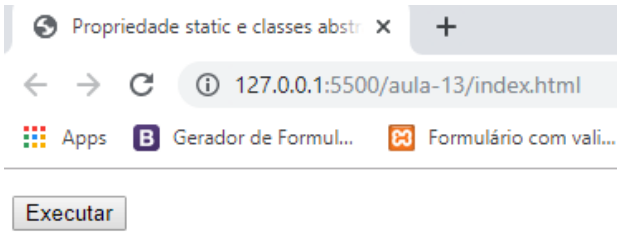
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Propriedade static e classes abstratas</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <p id="info4"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

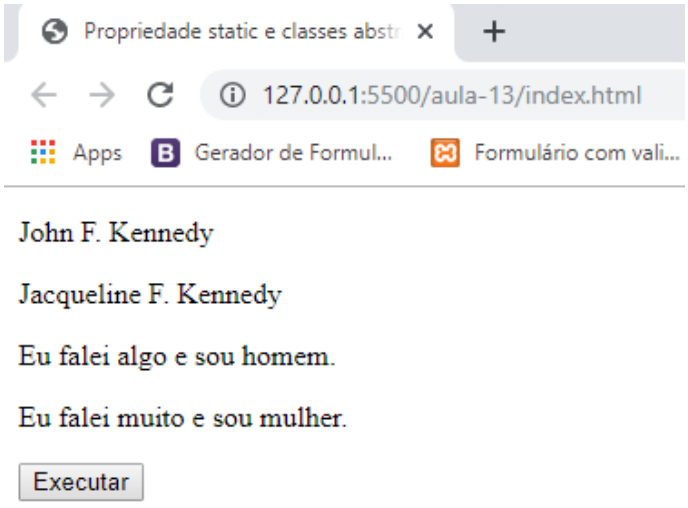
## aula-13\code.ts

```
function executar(){

    // classe - static properties

    class familia_kennedy {

        private _nome: string;
        static _sobrenome: string = "Kennedy";

        constructor(n: string){
            this._nome = n + ' ' + familia_kennedy._sobrenome;
        }

        get Nome(){
            return this._nome;
        }

    }

    // abstract classes

    abstract class humano{
        nome: string;
        idade: number;

        abstract falar(t: string): string;
    }
```

```
    class homem extends humano{
        falar(t: string){
            return "Eu falei " + t + " e sou homem.";
        }
    }

    class mulher extends humano{
        falar(t: string){
            return "Eu falei " + t + " e sou mulher.";
        }
    }

    let familiar1 = new familia_kennedy('John F.');
    let familiar2 = new familia_kennedy('Jacqueline F.');

    let h = new homem();
    let m = new mulher();

    document.getElementById("info1").innerHTML = familiar1.Nome;
    document.getElementById("info2").innerHTML = familiar2.Nome;
    document.getElementById("info3").innerHTML = h.falar('algo');
    document.getElementById("info4").innerHTML = m.falar('muito');

}
```

tsc -w code.ts



# Aula 14 - Functions

## aula-14\index.html

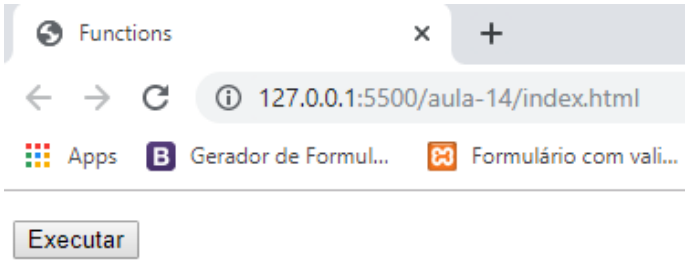
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Functions</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <p id="info4"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

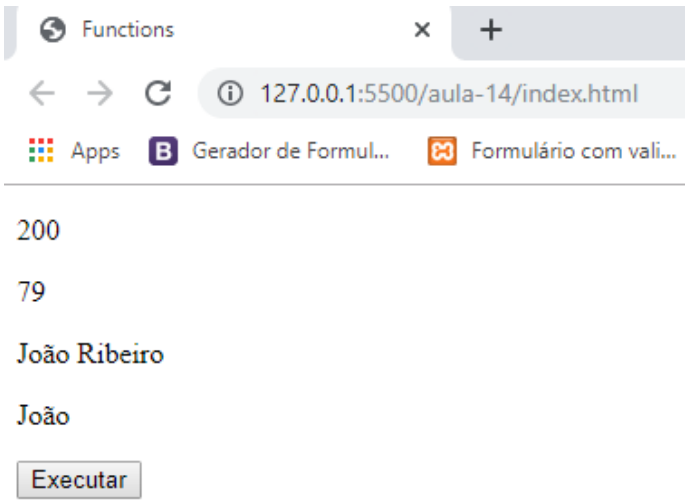
## aula-14\code.ts

```
function executar(){

    // funções (functions)

    function multiplicar(a: number, b: number){
        return a * b;
    }

    // funcões anônimas

    let f = function(c: number, d: number){
        return c + d;
    }

    function nomeCompleto(nome: string, sobrenome?: string): string {
        let n = "";

        if(sobrenome){
            n = nome + ' ' + sobrenome;
        } else {
            n = nome;
        }

        return n;

    }

    let resultado = multiplicar(10, 20);
```

```
    let soma = f(13, 66);

    document.getElementById('info1').innerHTML = resultado.toString();
    document.getElementById('info2').innerHTML = soma.toString();
    document.getElementById('info3').innerHTML = nomeCompleto('João', 'Ribeiro');
    document.getElementById('info4').innerHTML = nomeCompleto('João');

}
```

tsc -w code.ts



# Aula 15 - Functions (Rest parameters e Overloads)

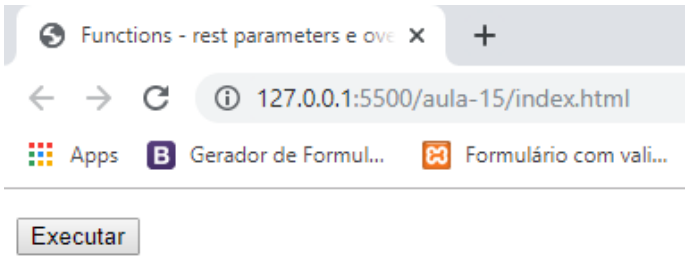
## aula-15\index.html

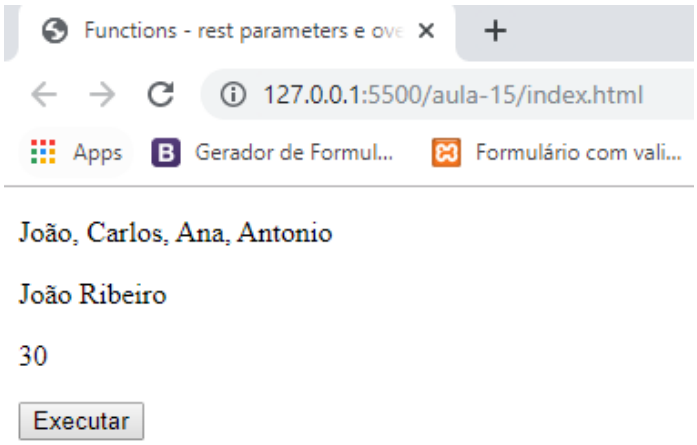
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Functions</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-15\code.ts

```
function executar(){

    // funções (functions)

    // rest parameters

    function listaNomes(nome: string, ...restantes: string[]): string{
        return nome + ", " + restantes.join(", ");
    }

    let nomes = listaNomes('João', 'Carlos', 'Ana', 'Antonio');

    document.getElementById('info1').innerHTML = nomes;

    // overload

    function juntar(x: any, y:any): any {
        return x + y;
    }

    let nome = juntar('João ', 'Ribeiro');
    let resultado = juntar(10, 20);

    document.getElementById('info2').innerHTML = nome;
    document.getElementById('info3').innerHTML = resultado;

}
```

tsc -w code.ts


Functions - rest parameters e ove
127.0.0.1:5500/aula-15/index.html
Apps
Gerador de Formul...
Formulário com vali...
Executar


Functions - rest parameters e ove
127.0.0.1:5500/aula-15/index.html
Apps
Gerador de Formul...
Formulário com vali...
João, Carlos, Ana, Antonio
João Ribeiro
30
Executar

# Aula 16 - Generics

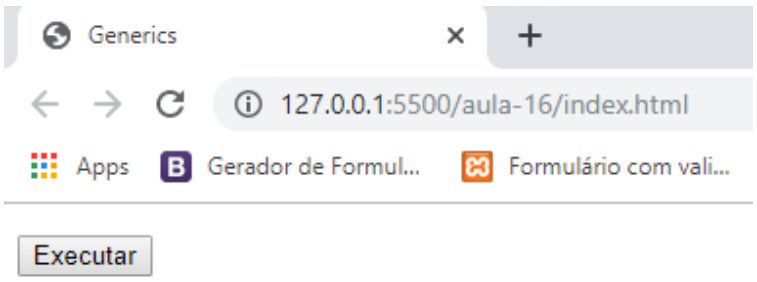
## aula-16\index.html

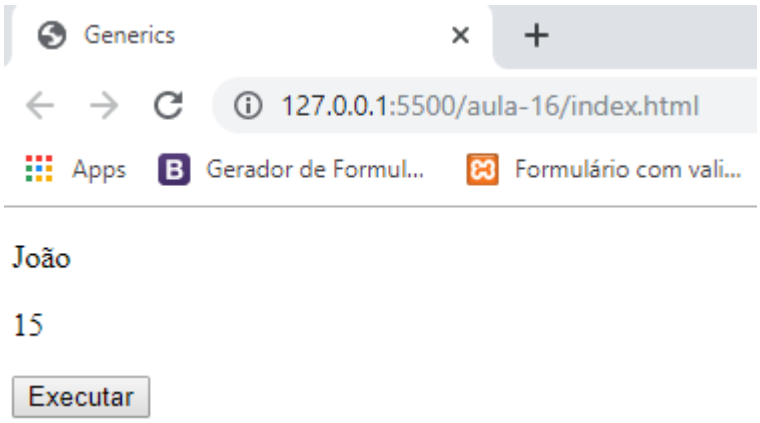
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Generics</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-16\code.ts

```
function executar(){

    // function apresentar(valor: any): any{
    //     return valor;
    // }

    // document.getElementById('info1').innerHTML = apresentar(5);

    // generics

    function apresentar<T>(valor: T): T{
        return valor;
    }

    let teste1 = apresentar<string>('João');
    let teste2 = apresentar<number>(15);

    document.getElementById('info1').innerHTML = teste1;
    document.getElementById('info2').innerHTML = teste2.toString();

}
```

tsc -w code.ts


Generics
127.0.0.1:5500/aula-16/index.html
Apps
Gerador de Formul...
Formulário com vali...
Executar


Generics
127.0.0.1:5500/aula-16/index.html
Apps
Gerador de Formul...
Formulário com vali...
João
15
Executar

# Aula 17 - Enums

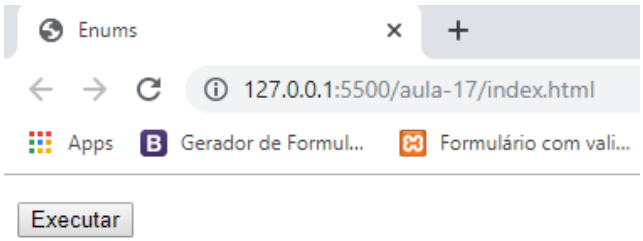
## aula-17\index.html

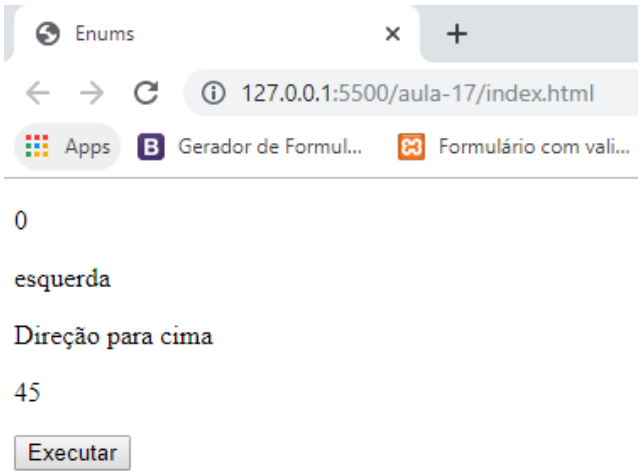
```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Enums</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <p id="info4"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-17\code.ts

```
function executar(){

    // enums
    enum direcoes{
        cima, baixo, esquerda, direita
    }

    let sentido1 = direcoes.cima; // 0
    let sentido2 = direcoes[2]; // esquerda

    function mover(sentido: direcoes){
        if(sentido == direcoes.cima){
            return "Direção para cima";
        }
    }

    enum partidos{
        pt=13, psl=17, pmdb=25, psdb=45
    }

    let eleicoes = partidos.psdb;

    document.getElementById('info1').innerHTML = sentido1.toString();
    document.getElementById('info2').innerHTML = sentido2;
    document.getElementById('info3').innerHTML = mover(0);
    document.getElementById('info4').innerHTML = eleicoes.toString();

}
```

tsc -w code.ts


Enums
127.0.0.1:5500/aula-17/index.html
Apps
Gerador de Formul...
Formulário com vali...
Executar


Enums
127.0.0.1:5500/aula-17/index.html
Apps
Gerador de Formul...
Formulário com vali...
0
esquerda
Direção para cima
45
Executar

# Aula 18 - Tipos e compatibilidade de tipos

## aula-18\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Tipos e compatibilidade de tipos</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <p id="info4"></p>
    <p id="info5"></p>
    <p id="info6"></p>
    <p id="info7"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

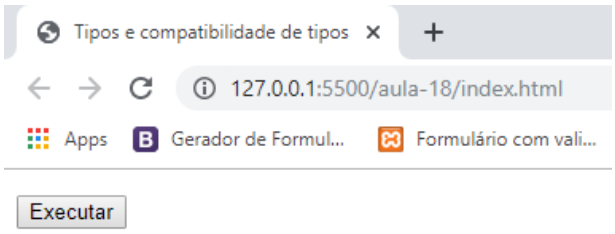
## aula-18\code.ts

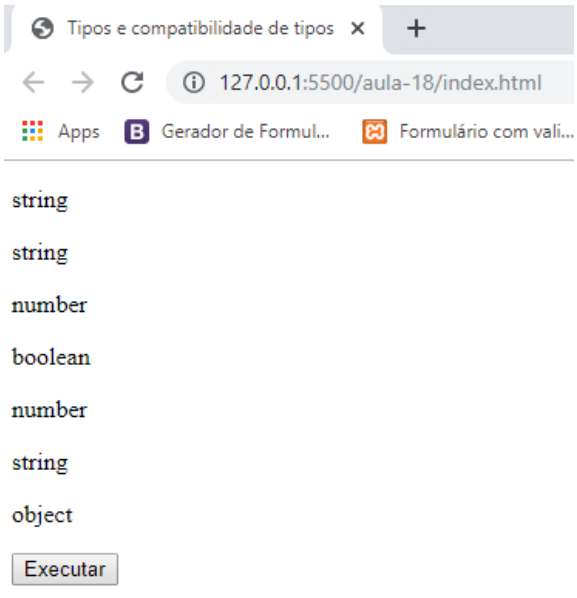
```
function executar(){

    // tipos e compatibilidade de tipos
    let nome = 'João';
    let sobrenome = "Ribeiro";
    let numero = 100;
    let status = true;

    enum direcoes {
        cima, baixo, esquerda, direita
    }

    let sentido = direcoes.cima;
    let x = direcoes[3];
    let y = [1, "João", 3];

    document.getElementById('info1').innerHTML = typeof(nome);
    document.getElementById('info2').innerHTML = typeof(sobrenome);
    document.getElementById('info3').innerHTML = typeof(numero);
    document.getElementById('info4').innerHTML = typeof(status);
    document.getElementById('info5').innerHTML = typeof(sentido);
    document.getElementById('info6').innerHTML = typeof(x);
    document.getElementById('info7').innerHTML = typeof(y);

}
```

tsc -w code.ts

## aula-18\code.js

```
function executar() {
    // tipos e compatibilidade de tipos
    var nome = 'João';
    var sobrenome = "Ribeiro";
    var numero = 100;
    var status = true;
    var direcoes;
    (function (direcoes) {
        direcoes[direcoes["cima"] = 0] = "cima";
        direcoes[direcoes["baixo"] = 1] = "baixo";
        direcoes[direcoes["esquerda"] = 2] = "esquerda";
        direcoes[direcoes["direita"] = 3] = "direita";
    })(direcoes || (direcoes = {}));
    var sentido = direcoes.cima;
    var x = direcoes[3];
    var y = [1, "João", 3];
    document.getElementById('info1').innerHTML = typeof (nome);
    document.getElementById('info2').innerHTML = typeof (sobrenome);
    document.getElementById('info3').innerHTML = typeof (numero);
    document.getElementById('info4').innerHTML = typeof (status);
    document.getElementById('info5').innerHTML = typeof (sentido);
    document.getElementById('info6').innerHTML = typeof (x);
    document.getElementById('info7').innerHTML = typeof (y);
}
```



# Aula 19 - Iterators for of e for in

## aula-19\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Iterators for of e for in</title>
</head>
<body>
    <p id="info1"></p>
    <p id="info2"></p>
    <p id="info3"></p>
    <p id="info4"></p>
    <p id="info5"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-19\code.ts

```
function executar(){

    // iterators

    let nomes1 = ['João', 'Ana', 'Carlos', 'Daniela', 'Sofia'];
    let elemento1 = document.getElementById("info1");
    elemento1.innerHTML = "";

    // for
    for(let i = 0; i < nomes1.length; i++){
        elemento1.innerHTML += `${nomes1[i]} <br />`;
    }

    // ============================================================

    let nomes2 = ['Francisco', 'Maria', 'Sérgio', 'Miriam', 'Aline'];
    let elemento2 = document.getElementById("info2");
    elemento2.innerHTML = "";


    // foreach(array) - 1ª versão
    nomes2.forEach(function(e){
        elemento2.innerHTML += `${e} <br />`;
    })

    // ============================================================
```

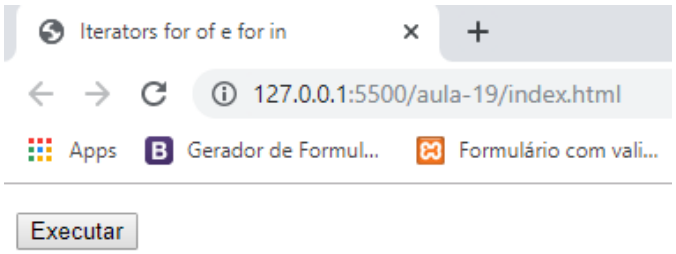
```
    let nomes3 = ['Paulo', 'Joana', 'Pedro', 'Nair', 'Rita'];
    let elemento3 = document.getElementById("info3");
    elemento3.innerHTML = "";

    // for arrow function

    nomes3.forEach(e => {
        elemento3.innerHTML += `${e} <br />`;
    })

    // ============================================================

    let nomes4 = ['Antonio', 'Beatriz', 'Roberto', 'Cecília', 'Deise'];
    let elemento4 = document.getElementById("info4");
    elemento4.innerHTML = "";

    // for ... of

    for(let e of nomes4){
        elemento4.innerHTML += `${e} <br />`;
    }

    // ============================================================

    let nomes5 = ['Rafael', 'Priscila', 'Daniel', 'Michelle', 'Caroline'];
    let elemento5 = document.getElementById("info5");
    elemento5.innerHTML = "";

    // for ... in

    for(let e in nomes5){
        elemento5.innerHTML += `${e} <br />`;
    }

    // ============================================================

}
```

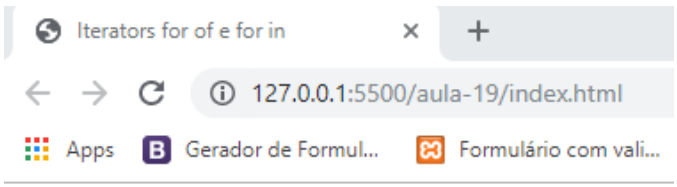
tsc -w code.ts

## aula-19\code.js

```
function executar() {
    // iterators
    var nomes1 = ['João', 'Ana', 'Carlos', 'Daniela', 'Sofia'];
    var elemento1 = document.getElementById("info1");
    elemento1.innerHTML = "";
    // for
    for (var i = 0; i < nomes1.length; i++) {
        elemento1.innerHTML += nomes1[i] + " <br />";
    }
    // ============================================================
    var nomes2 = ['Francisco', 'Maria', 'Sérgio', 'Miriam', 'Aline'];
    var elemento2 = document.getElementById("info2");
    elemento2.innerHTML = "";
```

```
    // foreach(array) - 1ª versão
    nomes2.forEach(function (e) {
        elemento2.innerHTML += e + " <br />";
    });
    // ================================================================
    var nomes3 = ['Paulo', 'Joana', 'Pedro', 'Nair', 'Rita'];
    var elemento3 = document.getElementById("info3");
    elemento3.innerHTML = "";
    // for arrow function
    nomes3.forEach(function (e) {
        elemento3.innerHTML += e + " <br />";
    });
    // ================================================================
    var nomes4 = ['Antonio', 'Beatriz', 'Roberto', 'Cecília', 'Deise'];
    var elemento4 = document.getElementById("info4");
    elemento4.innerHTML = "";
    // for ... of
    for (var _i = 0, nomes4_1 = nomes4; _i < nomes4_1.length; _i++) {
        var e = nomes4_1[_i];
        elemento4.innerHTML += e + " <br />";
    }
    // ================================================================
    var nomes5 = ['Rafael', 'Priscila', 'Daniel', 'Michelle', 'Caroline'];
    var elemento5 = document.getElementById("info5");
    elemento5.innerHTML = "";
    // for ... in
    for (var e in nomes5) {
        elemento5.innerHTML += e + " <br />";
    }
    // ================================================================
}
```






João
Ana
Carlos
Daniela
Sofia

Francisco
Maria
Sérgio
Miriam
Aline

Paulo
Joana
Pedro
Nair
Rita

Antonio
Beatriz
Roberto
Cecília
Deise

0
1
2
3
4

Executar

# Aula 20 - Modules export e import - Parte 1

## aula-20\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code.js"></script>
    <title>Modules export e import</title>
</head>
<body>
    <p id="info1"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-20\codigo.ts

```
export interface pessoa{
    nome: string,
    idade: number
}
```

## aula-20\code.ts

```
import { pessoa } from './codigo';

function criarPessoa(){
    let eu: pessoa;
}
```

# Aula 21 - Modules export e import - Parte 2

## aula-21\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code1.js"></script>
    <title>Modules export e import - Parte 2</title>
</head>
<body>
    <p id="info1"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-21\code1.ts

```
// import { pessoa, humano, enumSexo } from './code2';
import * as code from './code2';
import { animal } from './outro/codigoAnimal'


let eu: code.pessoa;
let animal: animal;
let voce = new code.humano();

voce.sexo = code.enumSexo.feminino;
```

## aula-21\code2.ts

```
interface pessoa {
    nome: string;
    idade: number;
}

enum enumSexo{
    masculino, feminino
}

class humano {
    nome: string;
    sexo: enumSexo;

    andar(){

    }
```

```
    saltar(){

    }

    falar(){

    }

}

export {pessoa, humano, enumSexo};
```

## aula-21\outro\codigoAnimal.ts

```
export interface animal{
    especie: string;
}
```

# Aula 22 - Namespaces

## aula-22\index.html

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <script src="code1.js"></script>
    <title>Modules export e import - Parte 2</title>
</head>
<body>
    <p id="info1"></p>
    <button type="button" onclick="executar()">Executar</button>
</body>
</html>
```

## aula-22\code1.ts

```
namespace terrestre {
    export interface animal {
        nome: string;
        especie: string;
    }
}
export { terrestre }
```

## aula-22\code2.ts

```
namespace maritimo {
    export interface animal {
        nome: string;
        especie: string;
    }
}
export { maritimo }
```

## aula-22\code.ts

```
import { terrestre } from './code1';
import { maritimo } from './code2';

let a: maritimo.animal;
let b: terrestre.animal;
```