Agenda

- What isTypeScript
- Language Introduction / Live Coding
- TypeScript and Angular
- Conclusion

Always fun being a SOLE JavaScript developer

Team Development Turns into war

Hmmmm!!! Issues with Dynamically Typed Languages

TypeScript to the RESCUE

What is TypeScript

TypeScript

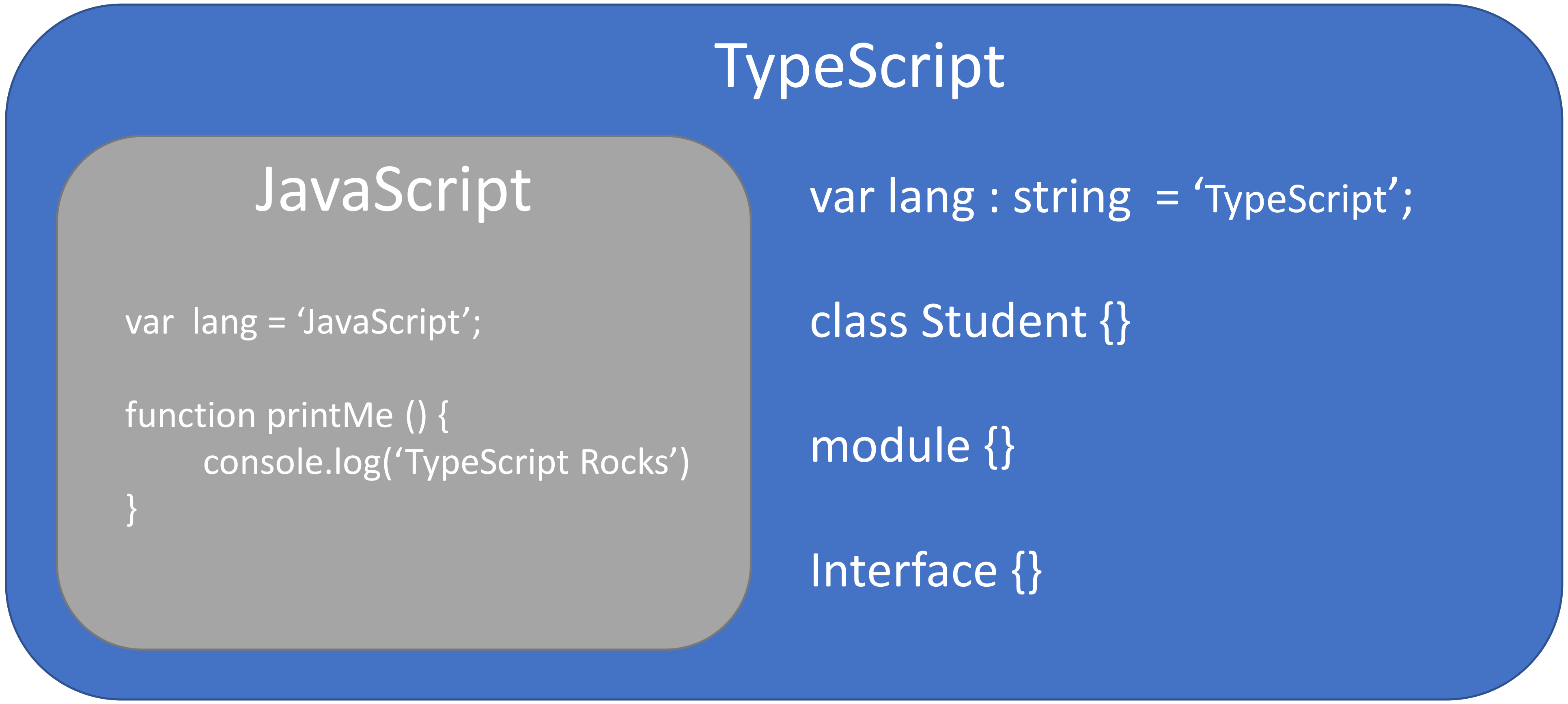
- ❖Superset of JavaScript
- ❖Extend JavaScript to facilitate writing large applications
- ❖Compile to plain JavaScript

What is TypeScript

TypeScript

- ❖Strongly Typed
- ❖Class-based Object-Orientation
- ❖Development Tooling
- ❖ TIP: If you are a C# or Java developer, then it feels like home

Superset of JavaScript



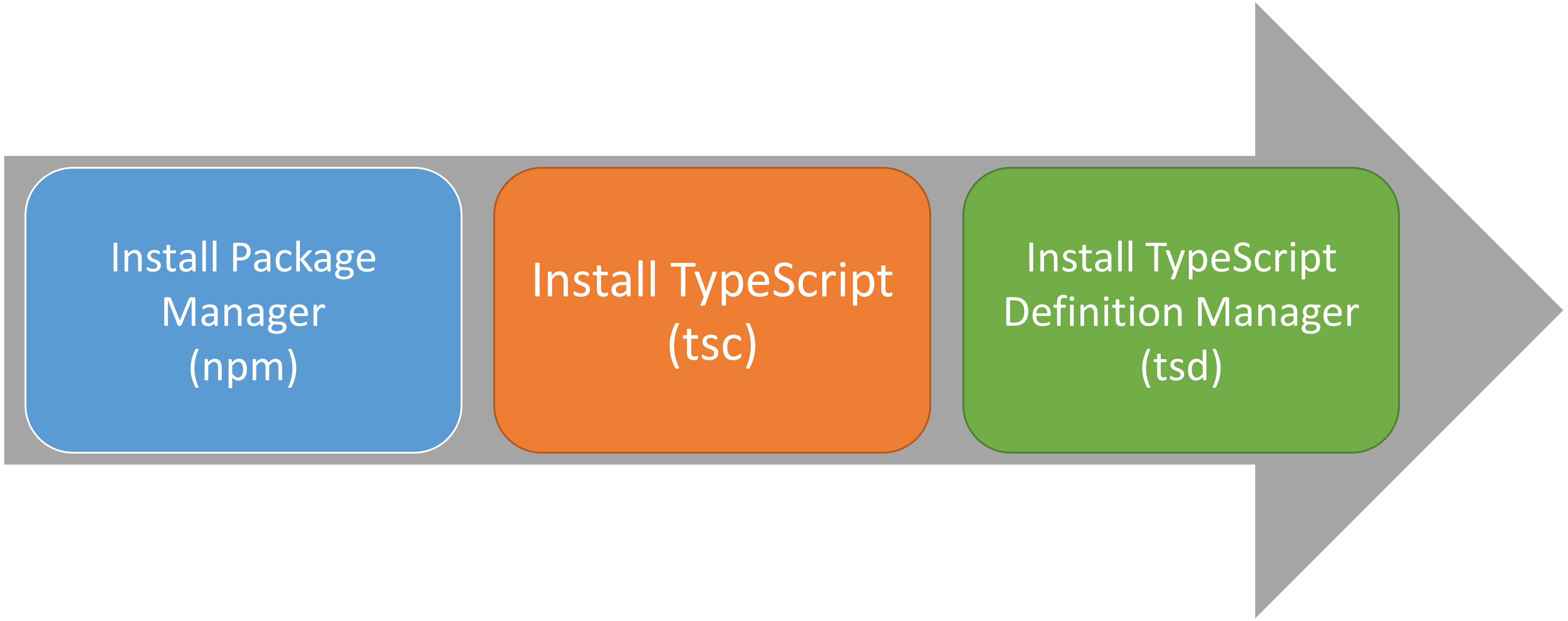
```
var  lang = 'JavaScript';

function printMe () {
        console.log('TypeScript Rocks')
}
```

```
var lang : string  = 'TypeScript';

class Student {}

module {}

Interface {}
```

TypeScript Transpiles to JavaScript

$$\begin{tikzcd}
\text{app.cs} \arrow[r, "\text{CSC}"] & \text{app.dll} \\
\text{app.js} \arrow[r, "\text{tsc}"] & \text{app.js (es*)}
\end{tikzcd}$$

Installing TypeScript


Install Package Manager (npm)
Install TypeScript (tsc)
Install TypeScript Definition Manager (tsd)

Installing TypeScript

```
>> npm install -g typescript

>> tsc helloworld.ts
```

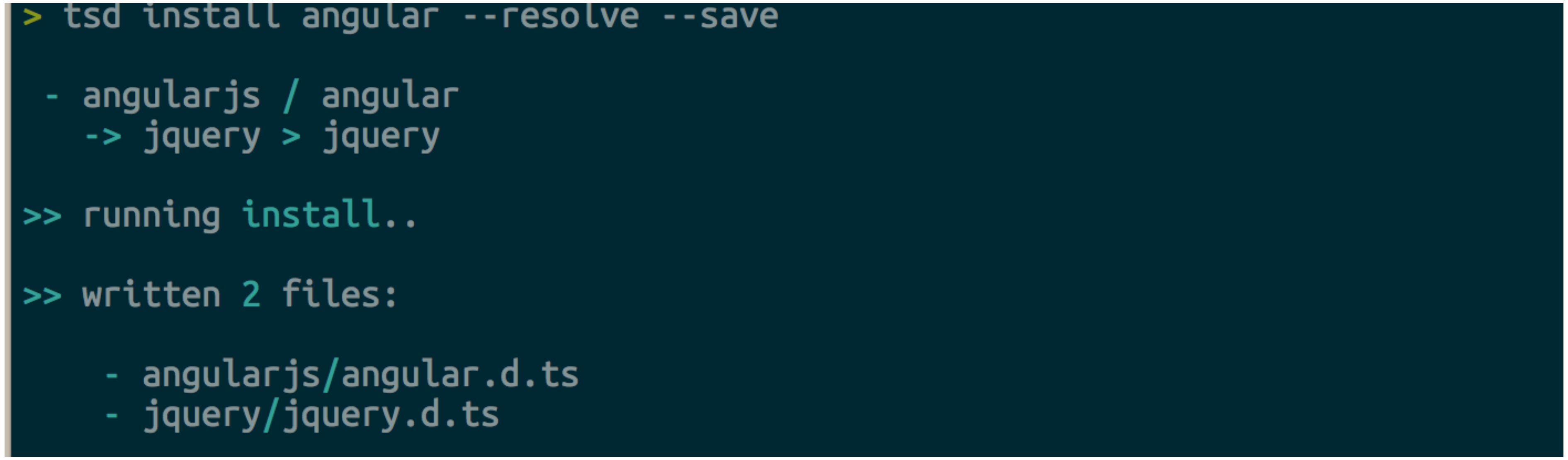
TypeScript Definition Files

- Describes the types defined in external libraries
- Suffixed .d.ts
- TypeScript Definition Manager (tsd)
  - Specialized package manager
  - Finds and installs TypeScript Definition files
  - Packages are found in DefinitelyTyped repository

TypeScript Definition Files

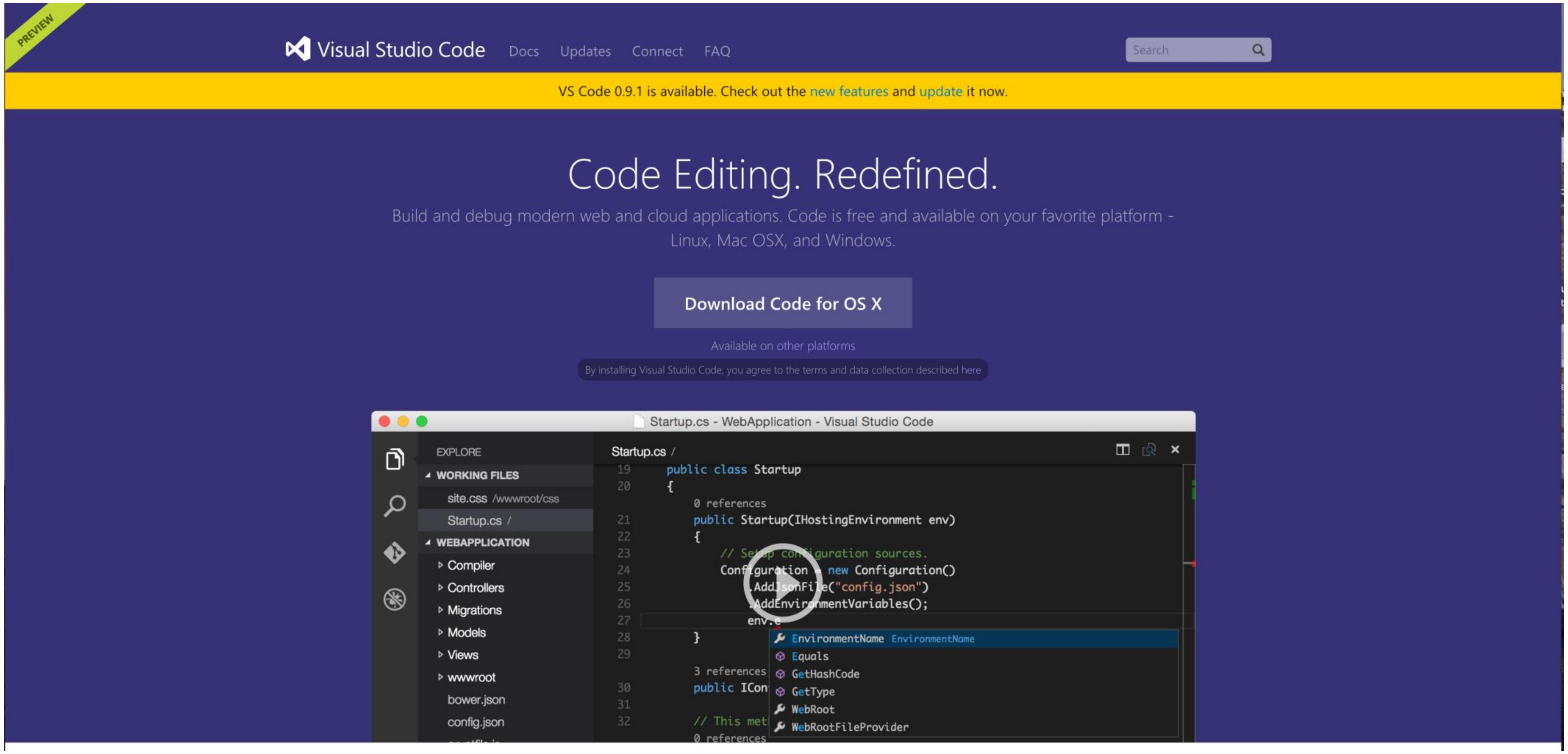
>> npm install tsd -g

>> tsd install angular –resolve –save



```
> tsd install angular --resolve --save

 - angularjs / angular
   -> jquery > jquery

>> running install..

>> written 2 files:

    - angularjs/angular.d.ts
    - jquery/jquery.d.ts
```

Code Editor of Choice



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Startup.cs - WebApplication - Visual Studio Code

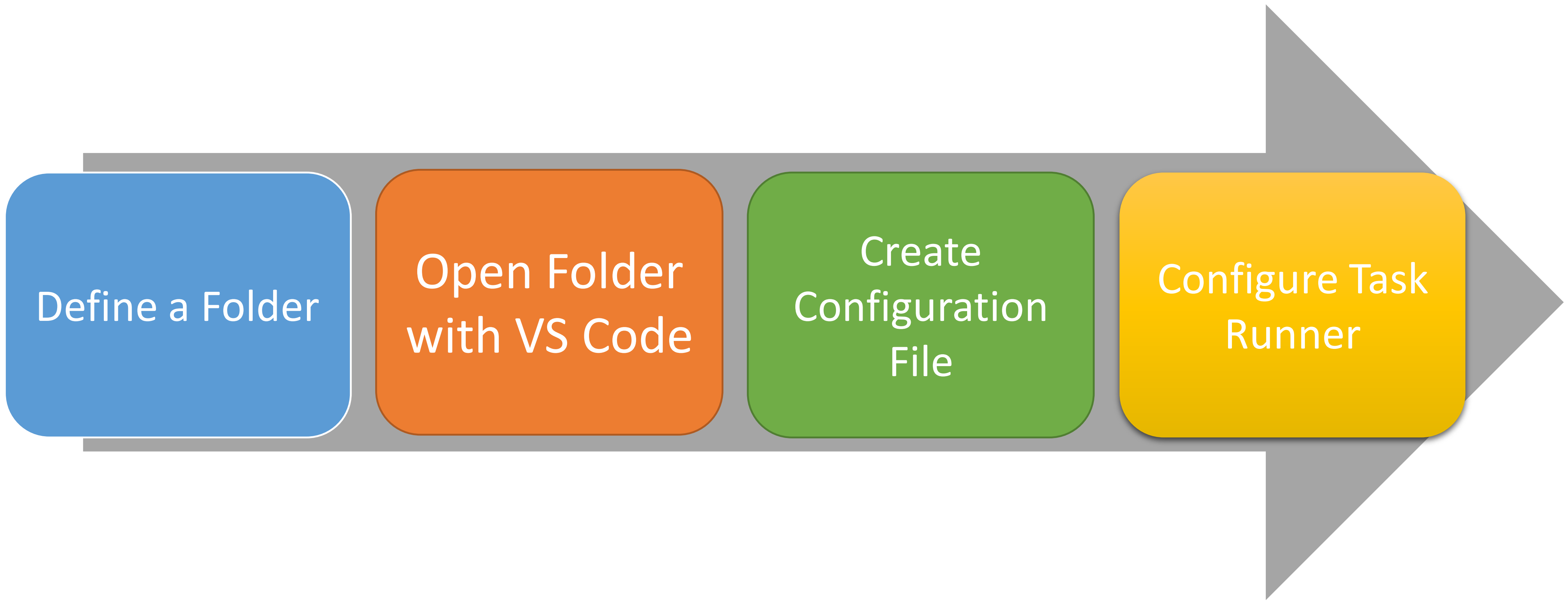
```
    public class Startup
    {
        0 references
        public Startup(IHostingEnvironment env)
        {
            // Setup configuration sources.
            Configuration = new Configuration()
                .AddJsonFile("config.json")
                .AddEnvironmentVariables();
                env.e
        }

        3 references
        public ICon

        // This met
        0 references
```

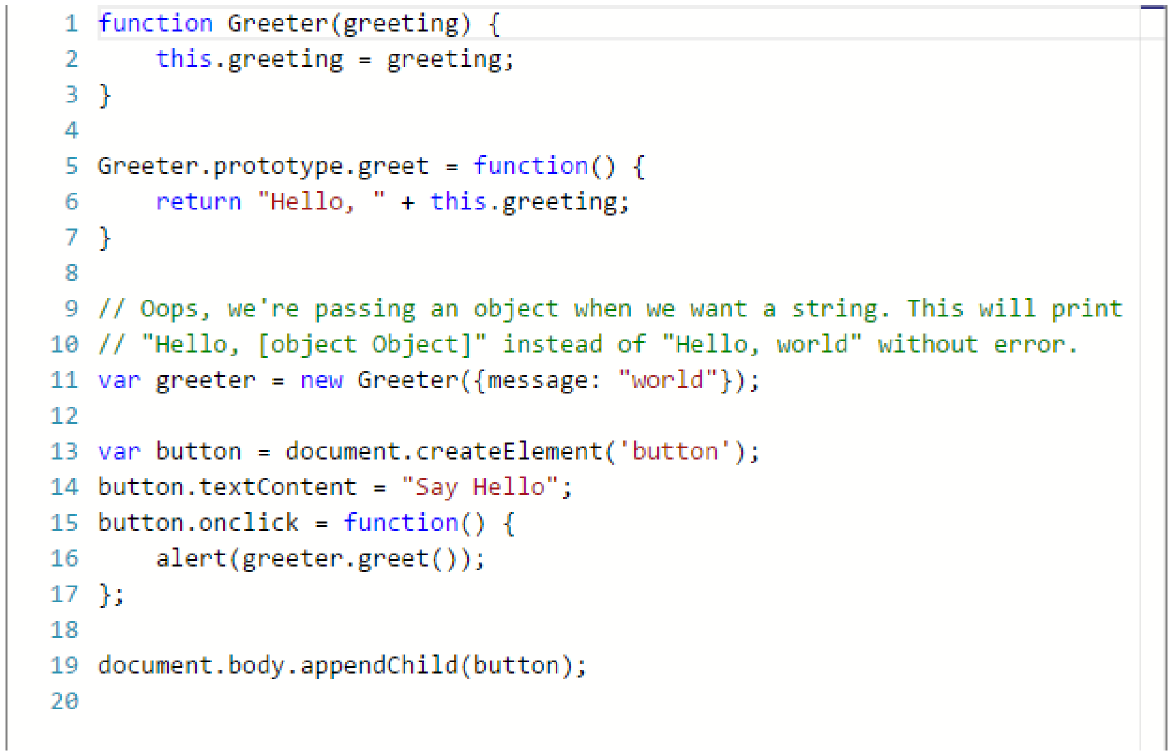
```
EnvironmentName  EnvironmentName
Equals
GetHashCode
GetType
WebRoot
WebRootFileProvider
```

Setting Up VS Code For TypeScript



Code samples from the TypeScript Site

Can you Identify the problem HERE!!!



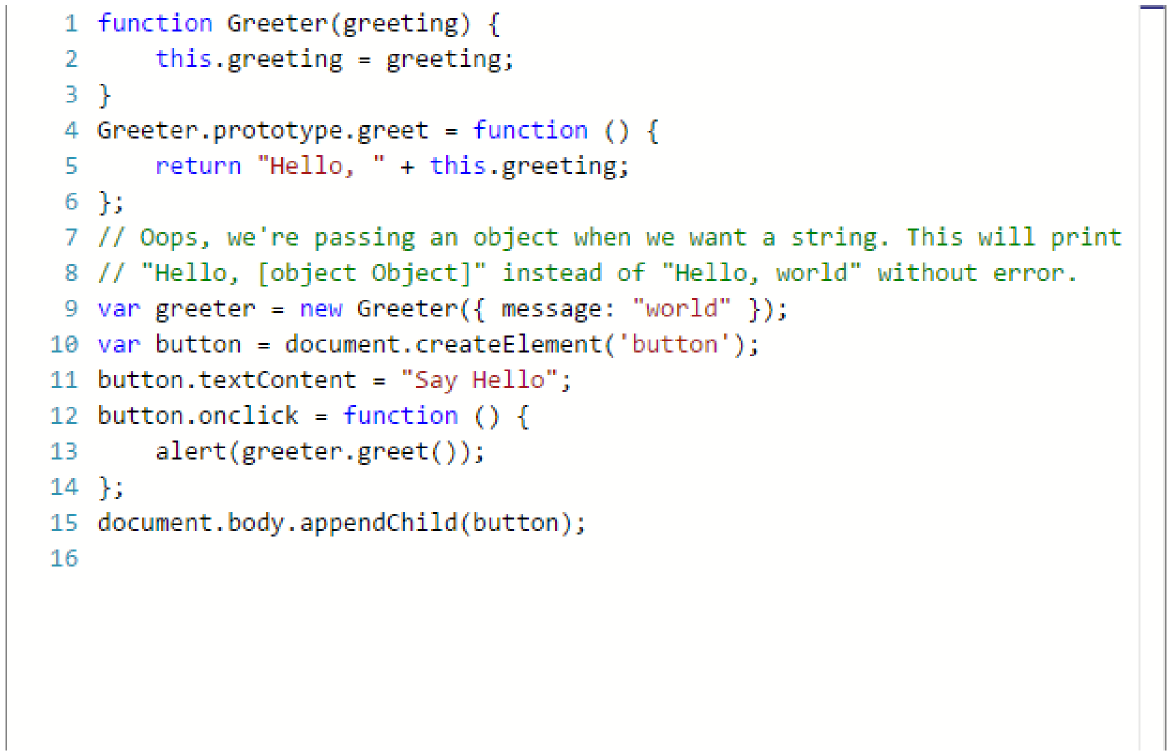
```
function Greeter(greeting) {
    this.greeting = greeting;
}

Greeter.prototype.greet = function() {
    return "Hello, " + this.greeting;
}

// Oops, we're passing an object when we want a string. This will print
// "Hello, [object Object]" instead of "Hello, world" without error.
var greeter = new Greeter({message: "world"});

var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function() {
    alert(greeter.greet());
};

document.body.appendChild(button);
```



```
function Greeter(greeting) {
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};
// Oops, we're passing an object when we want a string. This will print
// "Hello, [object Object]" instead of "Hello, world" without error.
var greeter = new Greeter({ message: "world" });
var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function () {
    alert(greeter.greet());
};
document.body.appendChild(button);
```
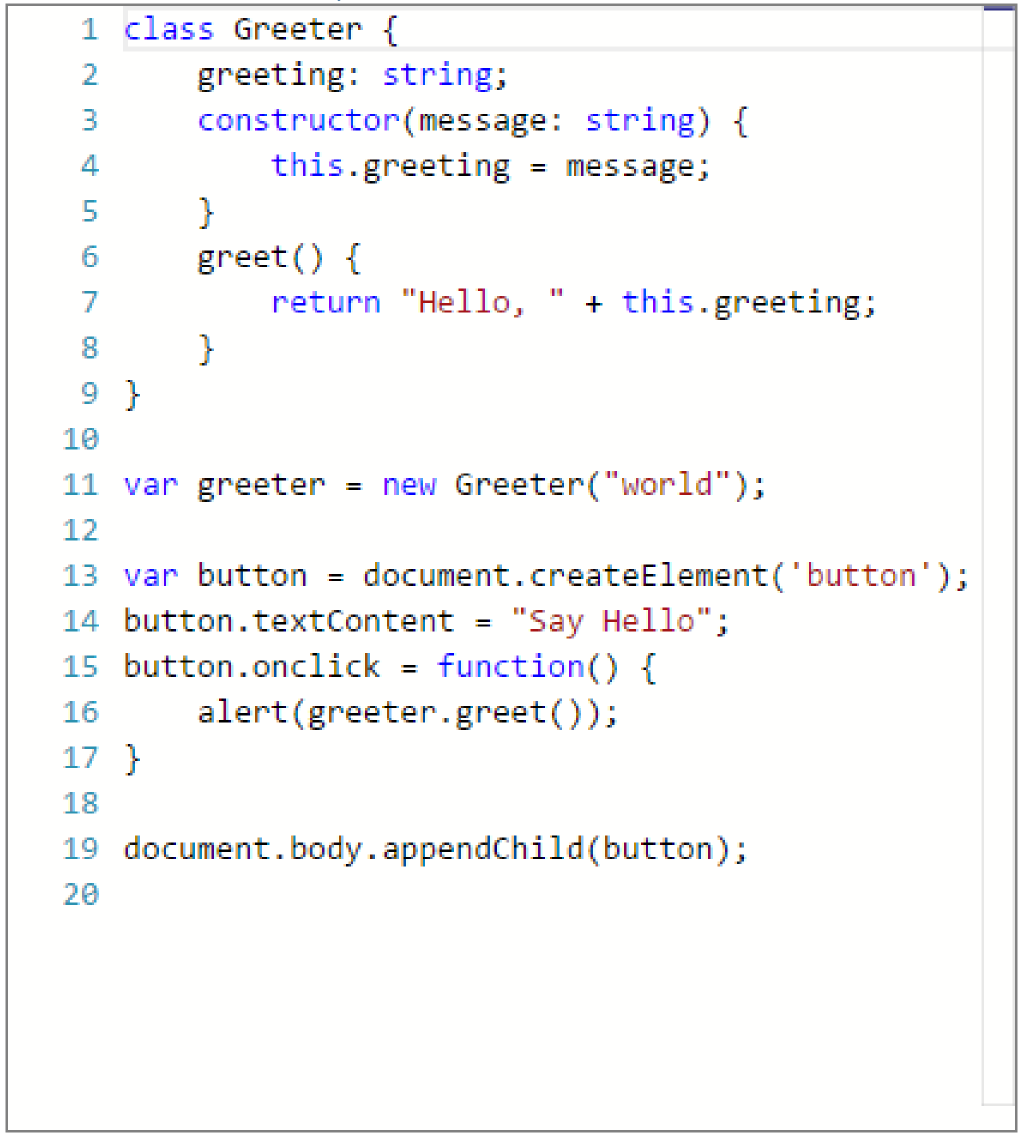
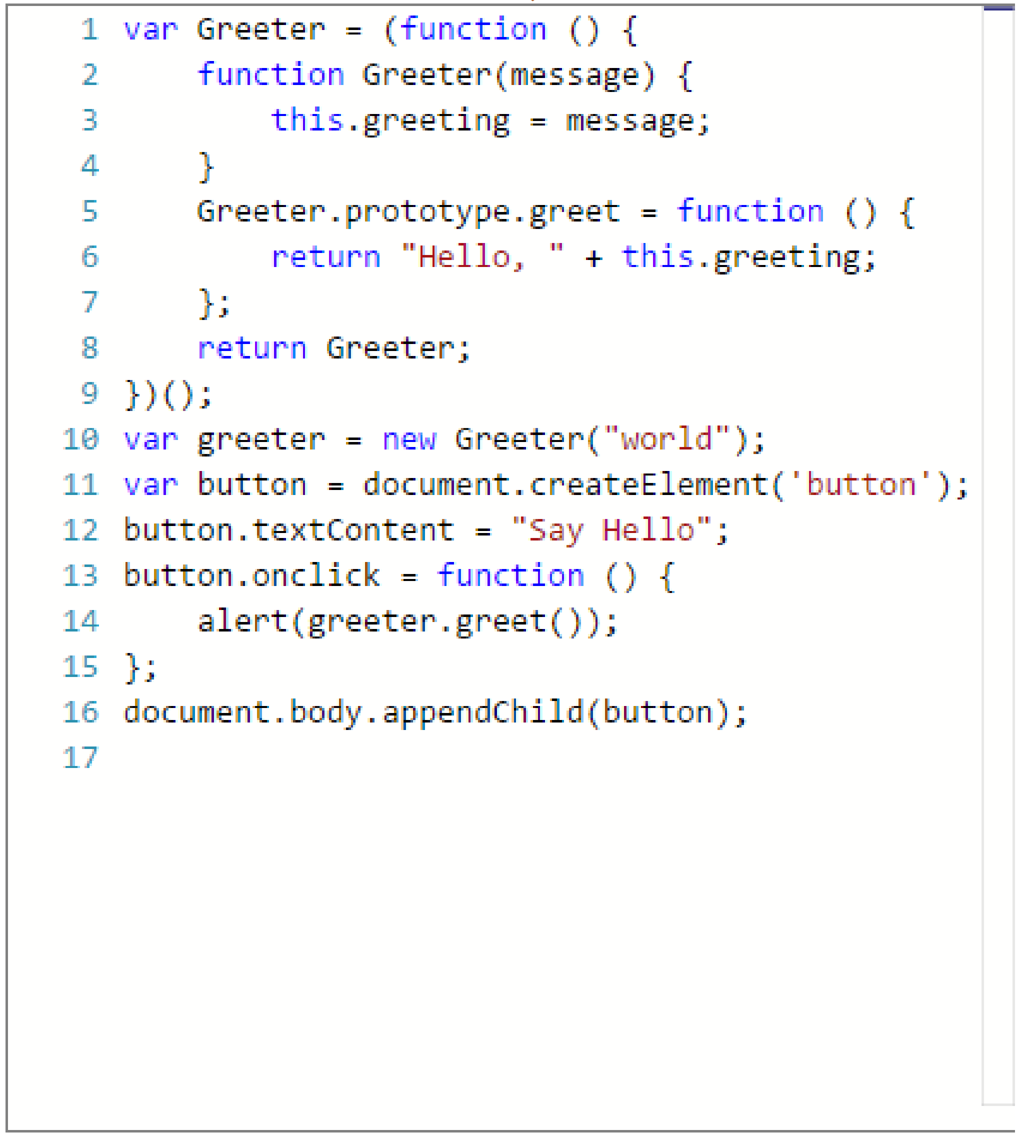

JavaScript



```
class Greeter {
    greeting: string;
    constructor(message: string) {
        this.greeting = message;
    }
    greet() {
        return "Hello, " + this.greeting;
    }
}

var greeter = new Greeter("world");

var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function() {
    alert(greeter.greet());
}

document.body.appendChild(button);
```

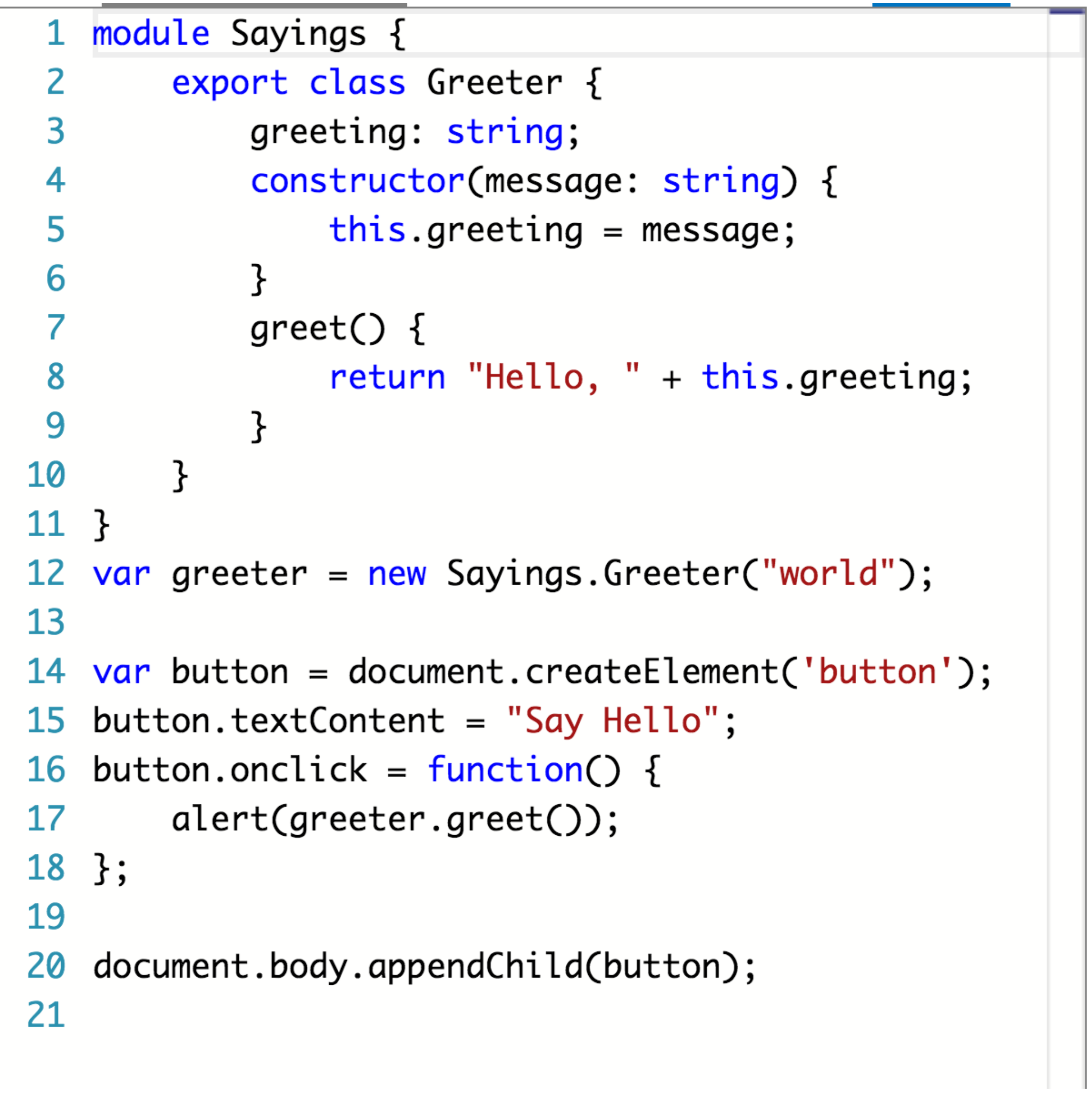
TypeScript



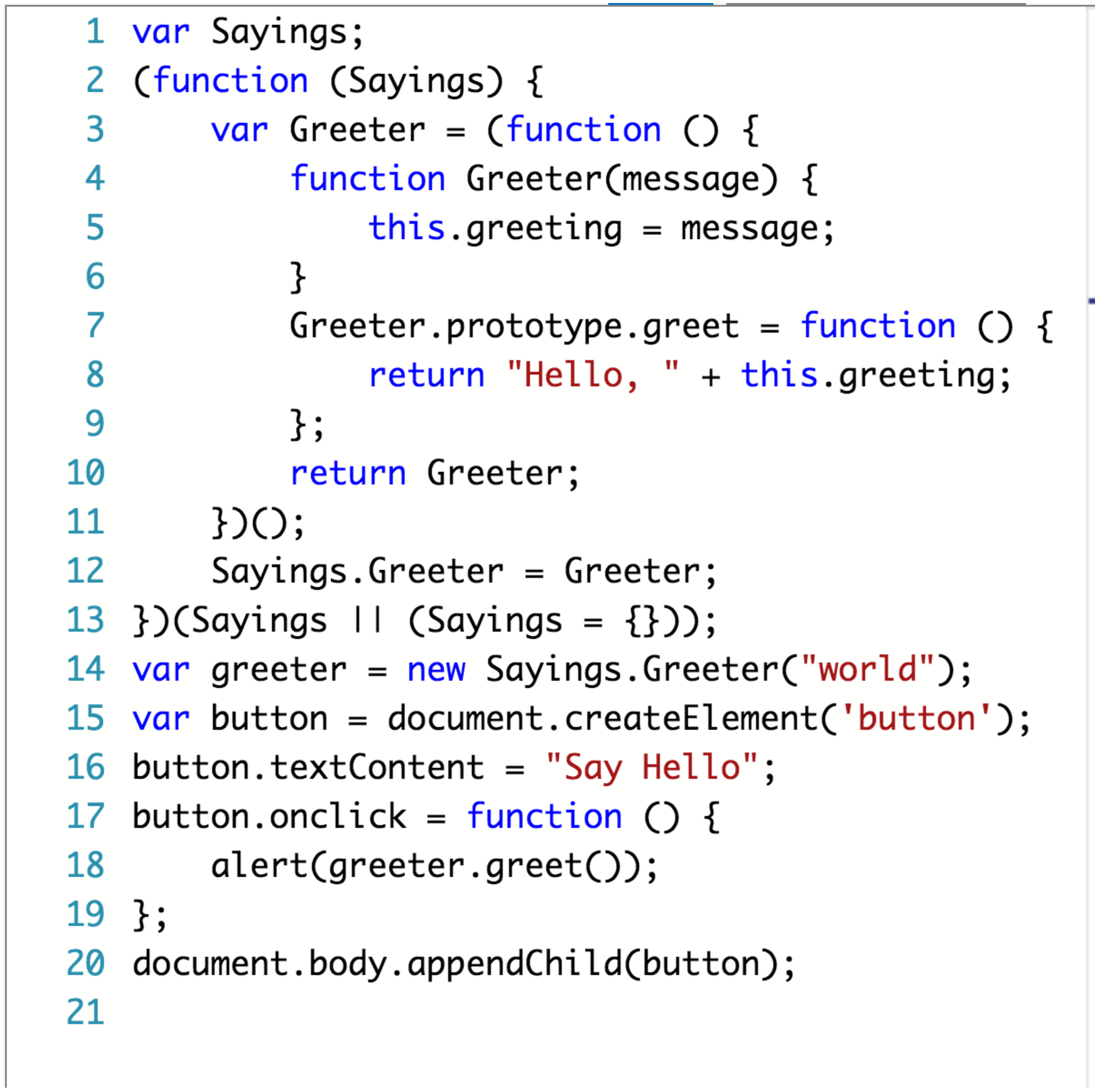
```
var Greeter = (function () {
    function Greeter(message) {
        this.greeting = message;
    }
    Greeter.prototype.greet = function () {
        return "Hello, " + this.greeting;
    };
    return Greeter;
})();
var greeter = new Greeter("world");
var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function () {
    alert(greeter.greet());
};
document.body.appendChild(button);
```

```typescript
class Animal {
    constructor(public name: string) { }
    move(meters: number) {
        alert(this.name + " moved " + meters + "m.");
    }
}

class Snake extends Animal {
    constructor(name: string) { super(name); }
    move() {
        alert("Slithering...");
        super.move(5);
    }
}

class Horse extends Animal {
    constructor(name: string) { super(name); }
    move() {
        alert("Galloping...");
        super.move(45);
    }
}

var sam = new Snake("Sammy the Python");
var tom: Animal = new Horse("Tommy the Palomino");

sam.move();
tom.move(34);

```

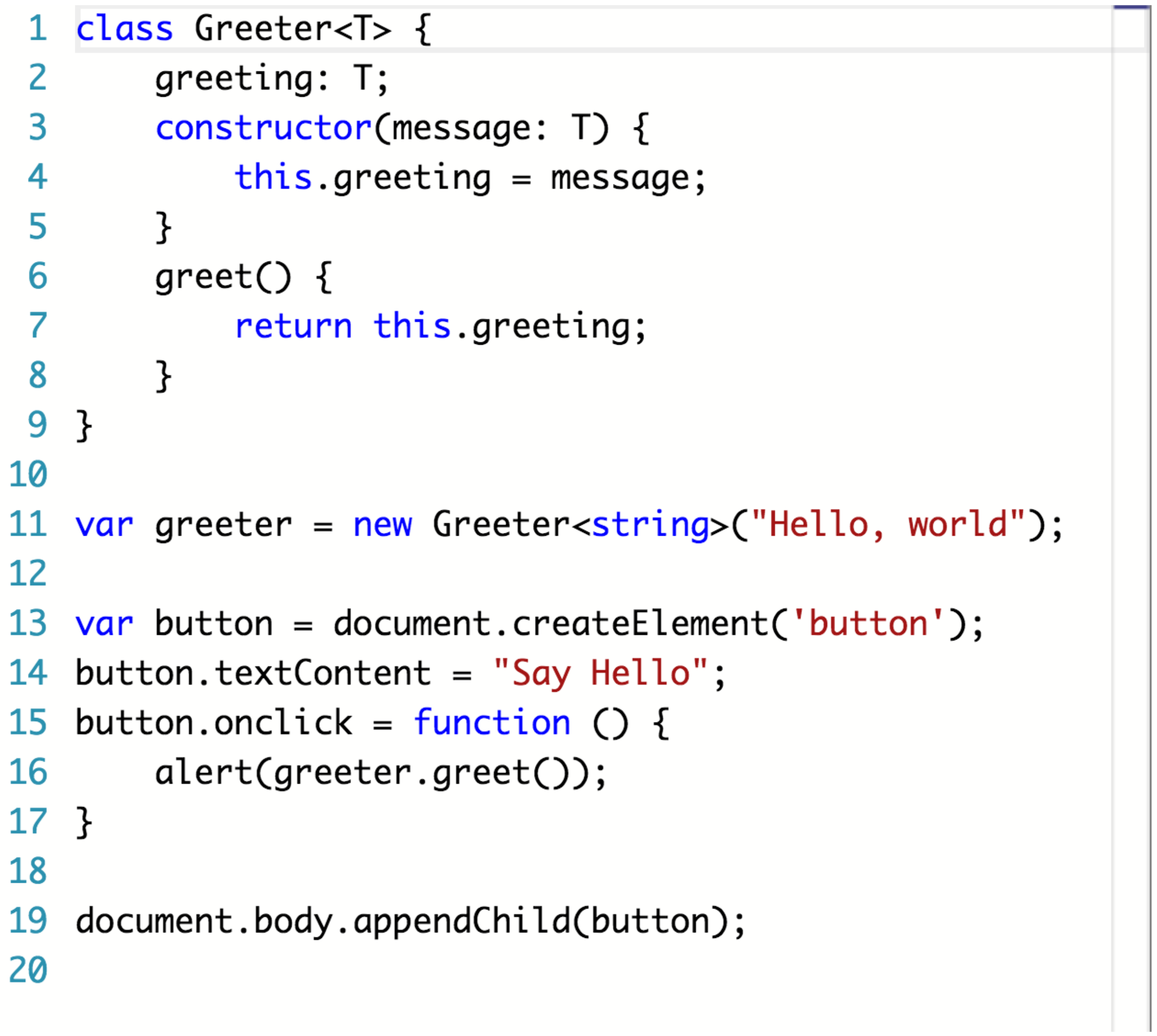
```javascript
var __extends = (this && this.__extends) || function (d, b) {
    for (var p in b) if (b.hasOwnProperty(p)) d[p] = b[p];
    function __() { this.constructor = d; }
    d.prototype = b === null ? Object.create(b) : (__.prototype = b.prototype, new __());
};
var Animal = (function () {
    function Animal(name) {
        this.name = name;
    }
    Animal.prototype.move = function (meters) {
        alert(this.name + " moved " + meters + "m.");
    };
    return Animal;
})();
var Snake = (function (_super) {
    __extends(Snake, _super);
    function Snake(name) {
        _super.call(this, name);
    }
    Snake.prototype.move = function () {
        alert("Slithering...");
        _super.prototype.move.call(this, 5);
    };
    return Snake;
})(Animal);
var Horse = (function (_super) {
    __extends(Horse, _super);
    function Horse(name) {
        _super.call(this, name);
    }
    Horse.prototype.move = function () {
        alert("Galloping...");
        _super.prototype.move.call(this, 45);
    };
    return Horse;
})(Animal);
var sam = new Snake("Sammy the Python");
var tom = new Horse("Tommy the Palomino");
sam.move();
tom.move(34);

```



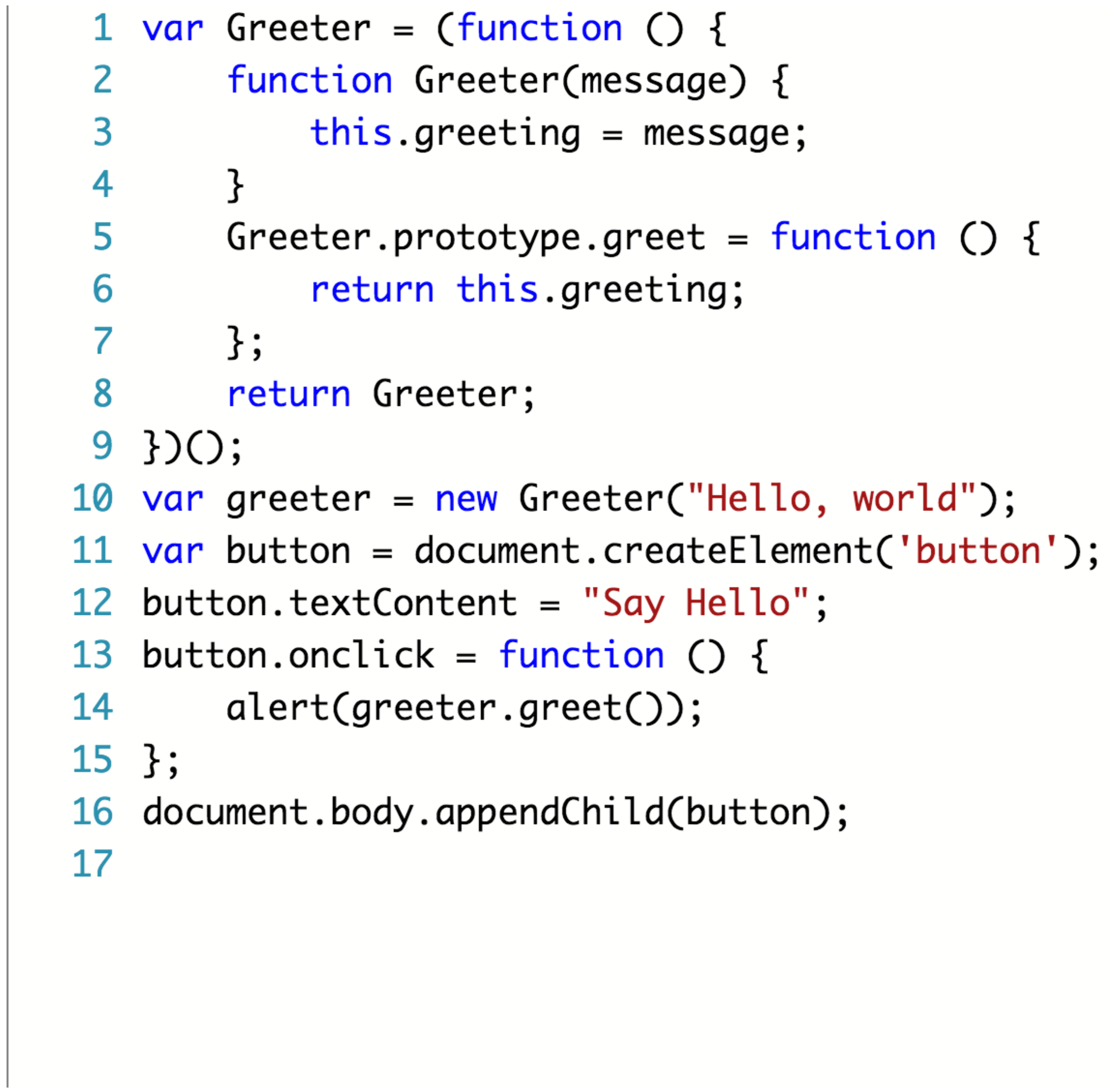
```typescript
module Sayings {
    export class Greeter {
        greeting: string;
        constructor(message: string) {
            this.greeting = message;
        }
        greet() {
            return "Hello, " + this.greeting;
        }
    }
}
var greeter = new Sayings.Greeter("world");

var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function() {
    alert(greeter.greet());
};

document.body.appendChild(button);

```



```javascript
var Sayings;
(function (Sayings) {
    var Greeter = (function () {
        function Greeter(message) {
            this.greeting = message;
        }
        Greeter.prototype.greet = function () {
            return "Hello, " + this.greeting;
        };
        return Greeter;
    })();
    Sayings.Greeter = Greeter;
})(Sayings || (Sayings = {}));
var greeter = new Sayings.Greeter("world");
var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function () {
    alert(greeter.greet());
};
document.body.appendChild(button);

```



```
class Greeter<T> {
    greeting: T;
    constructor(message: T) {
        this.greeting = message;
    }
    greet() {
        return this.greeting;
    }
}

var greeter = new Greeter<string>("Hello, world");

var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function () {
    alert(greeter.greet());
}

document.body.appendChild(button);

```



```
var Greeter = (function () {
    function Greeter(message) {
        this.greeting = message;
    }
    Greeter.prototype.greet = function () {
        return this.greeting;
    };
    return Greeter;
})();
var greeter = new Greeter("Hello, world");
var button = document.createElement('button');
button.textContent = "Say Hello";
button.onclick = function () {
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```

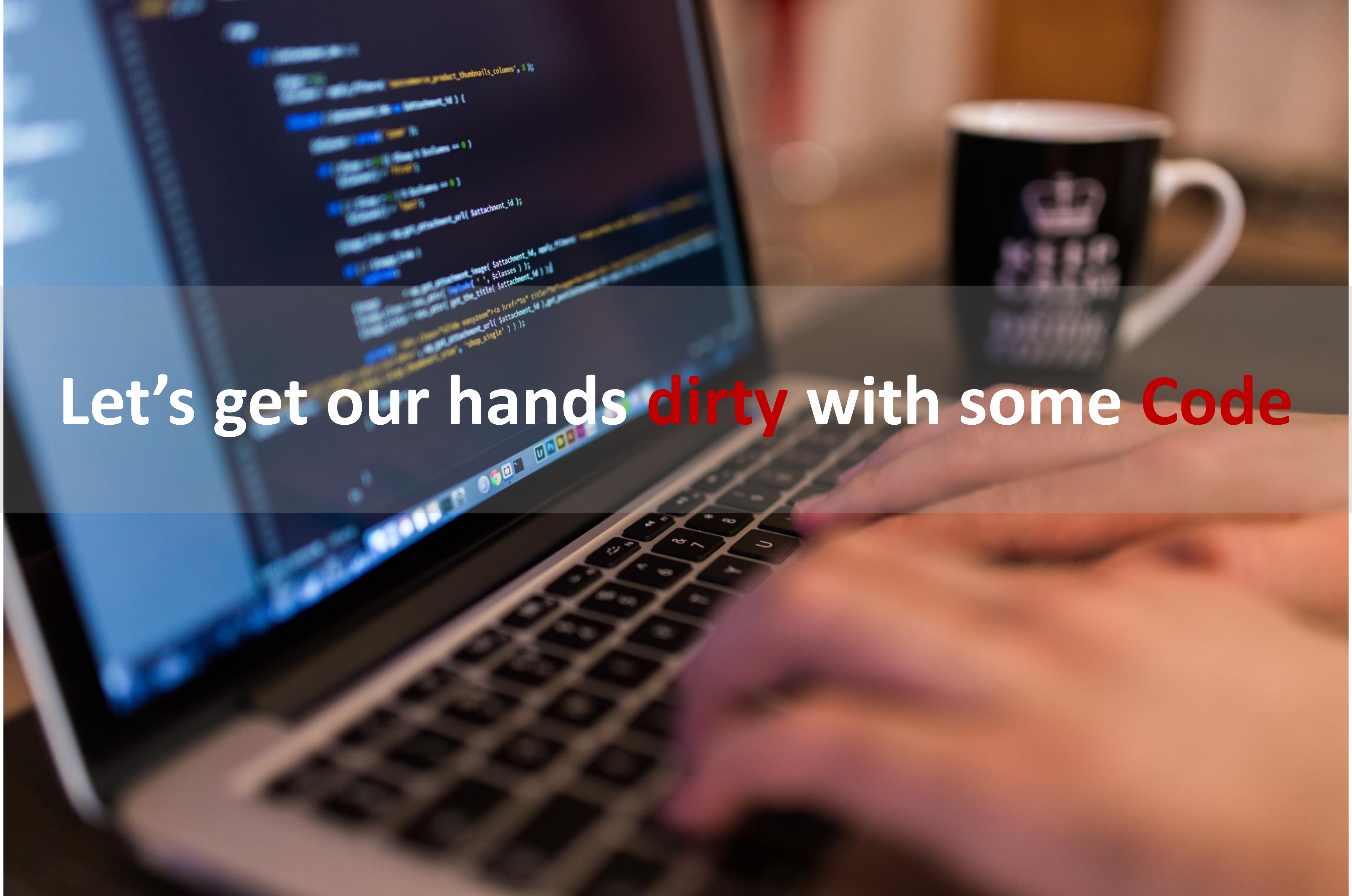

Let’s get our hands dirty with some Code