JAVASCRIPT-PLUS-S22-Modules

modules
Training Clarusway
Pear Deck - March 2, 2022 at 10:31AM

Part 1 - Summary

Use this space to summarize your thoughts on the lesson

Part 2 - Responses

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JavaScript Modules
Javascript Plus Session-22

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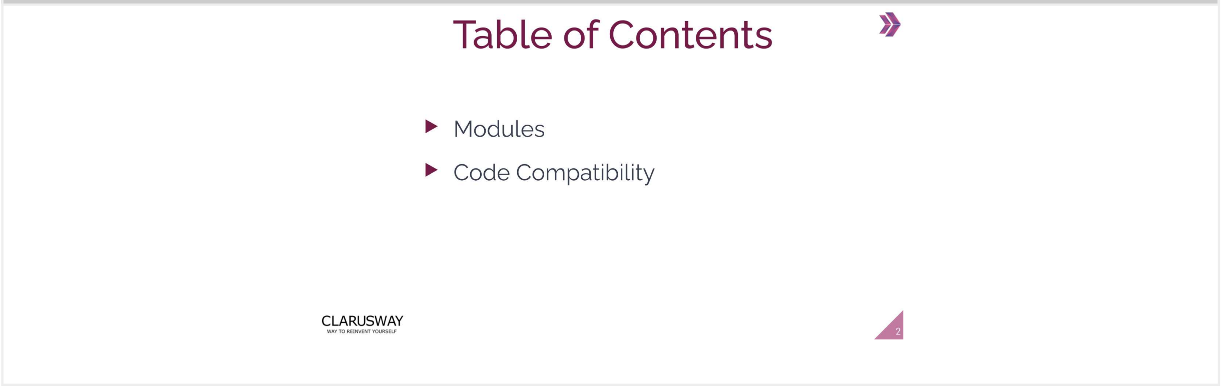

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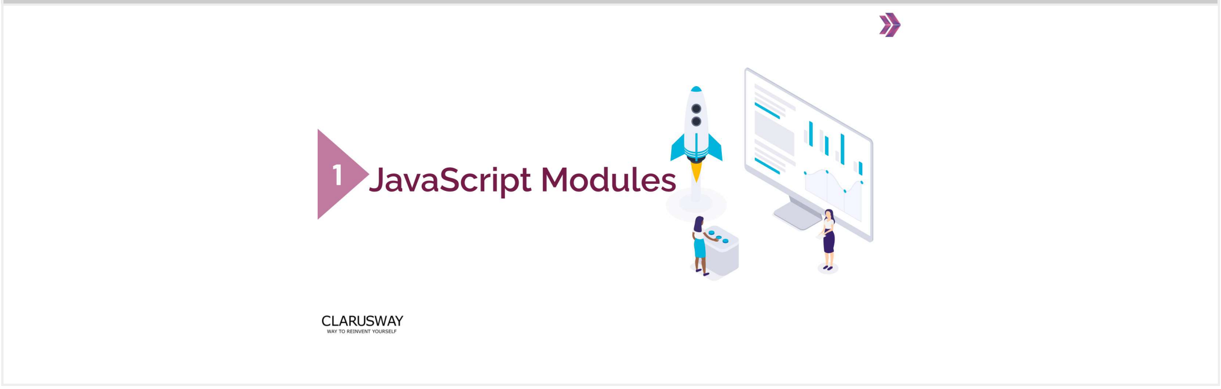

1 JavaScript Modules

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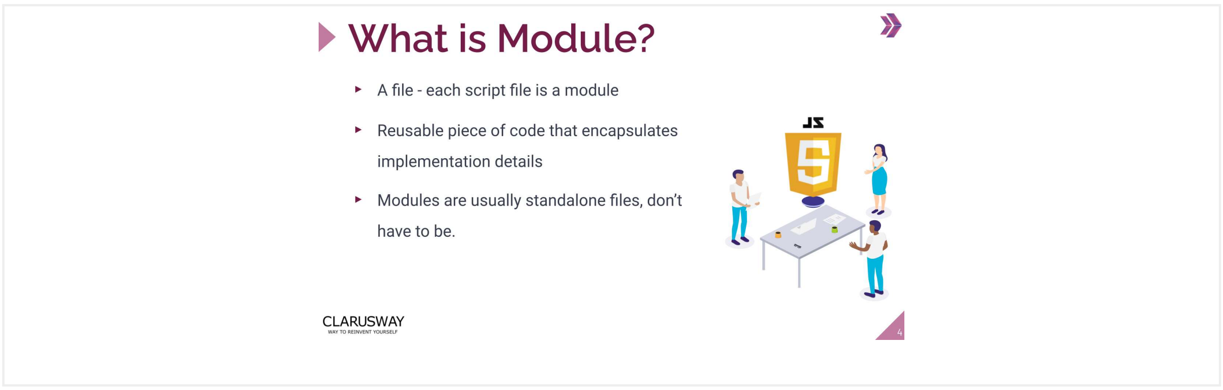

What is Module?

- A file - each script file is a module
- Reusable piece of code that encapsulates implementation details
- Modules are usually standalone files, don't have to be.

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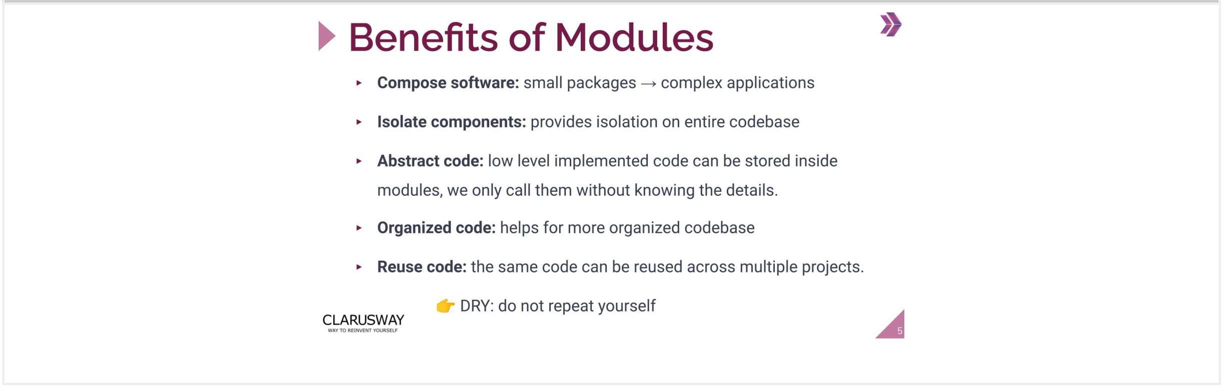

Benefits of Modules

- **Compose software:** small packages → complex applications
- **Isolate components:** provides isolation on entire codebase
- **Abstract code:** low level implemented code can be stored inside modules, we only call them without knowing the details.
- **Organized code:** helps for more organized codebase
- **Reuse code:** the same code can be reused across multiple projects.

👉 DRY: do not repeat yourself

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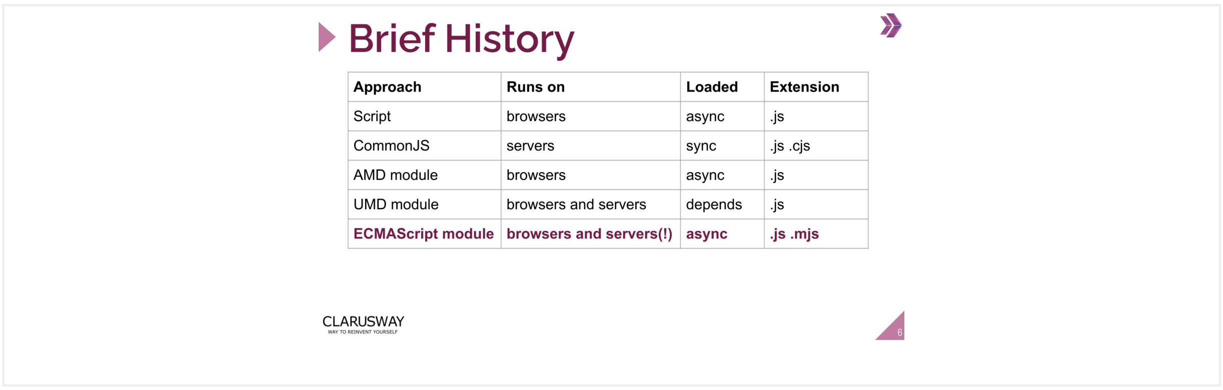

Brief History

Approach	Runs on	Loaded	Extension
Script	browsers	async	.js
CommonJS	servers	sync	.js .cjs
AMD module	browsers	async	.js
UMD module	browsers and servers	depends	.js
ECMAScript module	**browsers and servers(!)**	**async**	**.js .mjs**

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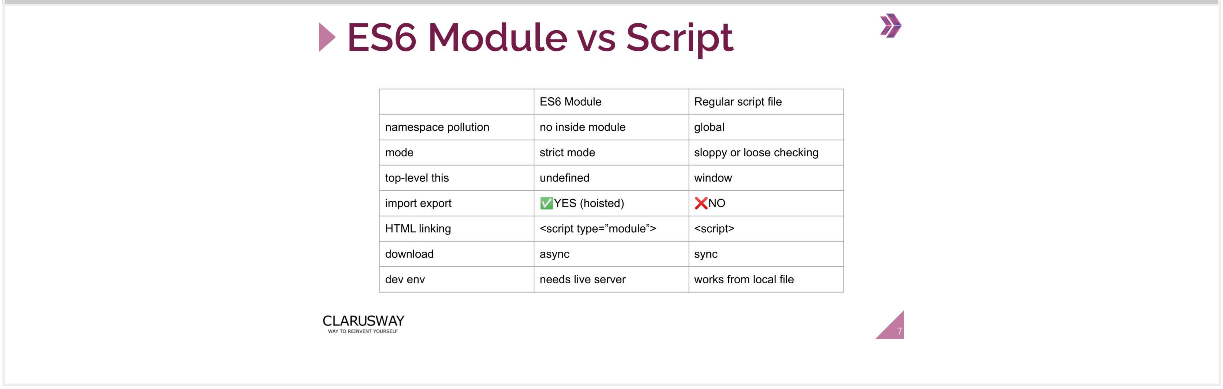

ES6 Module vs Script

	ES6 Module	Regular script file
namespace pollution	no inside module	global
mode	strict mode	sloppy or loose checking
top-level this	undefined	window
import export	✅YES (hoisted)	❌NO
HTML linking	<script type="module">	<script>
download	async	sync
dev env	needs live server	works from local file

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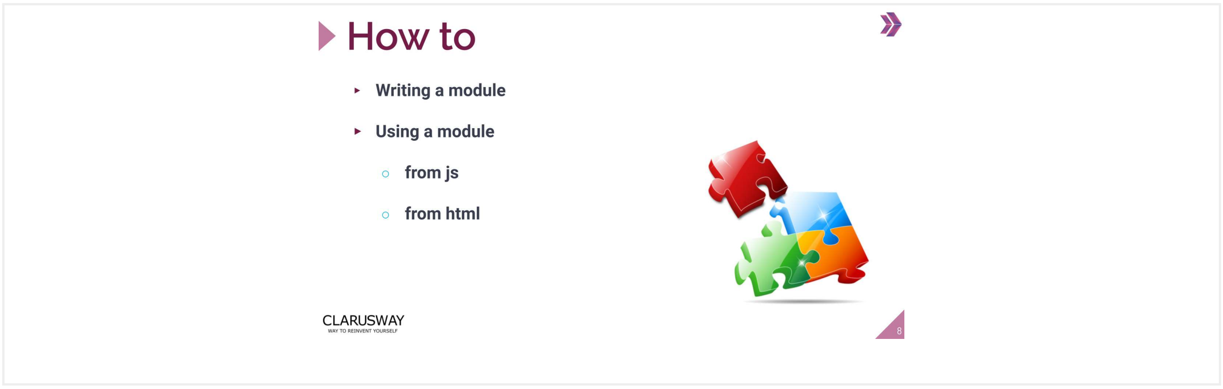

How to

- Writing a module
- Using a module
    - from js
    - from html

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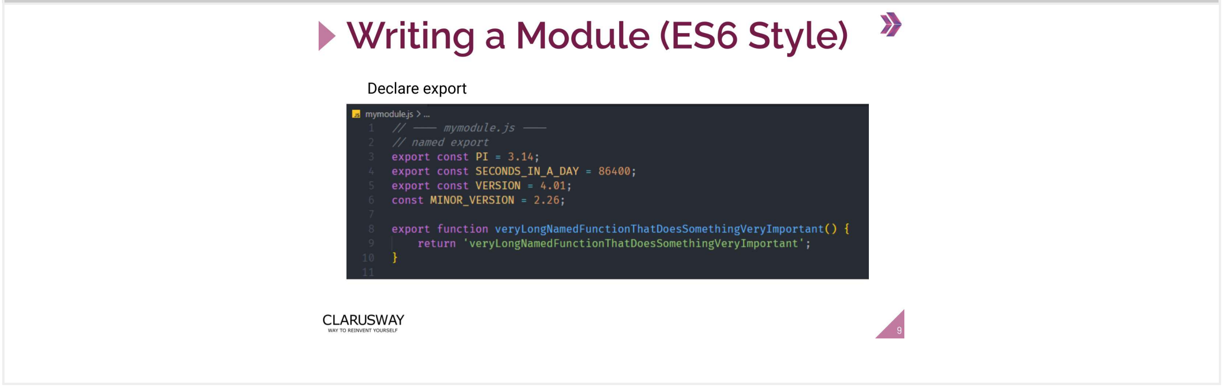

Writing a Module (ES6 Style)

Declare export

mymodule.js > ...

```
// ——— mymodule.js ———
// named export
export const PI = 3.14;
export const SECONDS_IN_A_DAY = 86400;
export const VERSION = 4.01;
const MINOR_VERSION = 2.26;

export function veryLongNamedFunctionThatDoesSomethingVeryImportant() {
    return 'veryLongNamedFunctionThatDoesSomethingVeryImportant';
}
```

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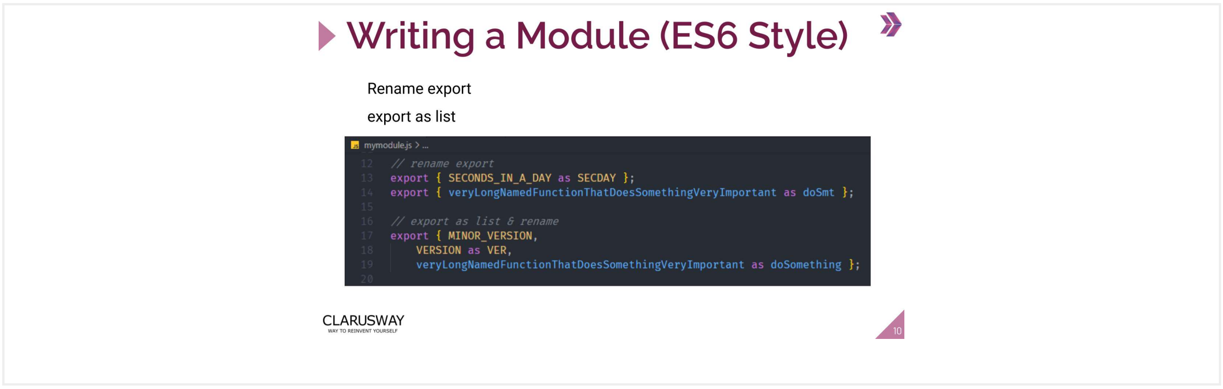

Writing a Module (ES6 Style)

Rename export

export as list

mymodule.js > ...

```
// rename export
export { SECONDS_IN_A_DAY as SECDAY };
export { veryLongNamedFunctionThatDoesSomethingVeryImportant as doSmt };

// export as list & rename
export { MINOR_VERSION,
    VERSION as VER,
    veryLongNamedFunctionThatDoesSomethingVeryImportant as doSomething };
```

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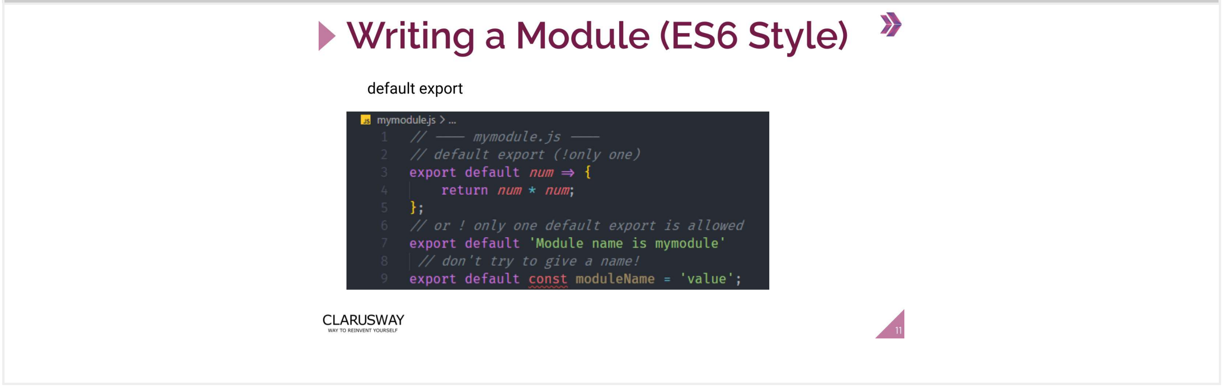

Writing a Module (ES6 Style)

default export

mymodule.js > ...

```
// ─── mymodule.js ───
// default export (!only one)
export default num => {
    return num * num;
};
// or ! only one default export is allowed
export default 'Module name is mymodule'
 // don't try to give a name!
export default const moduleName = 'value';
```

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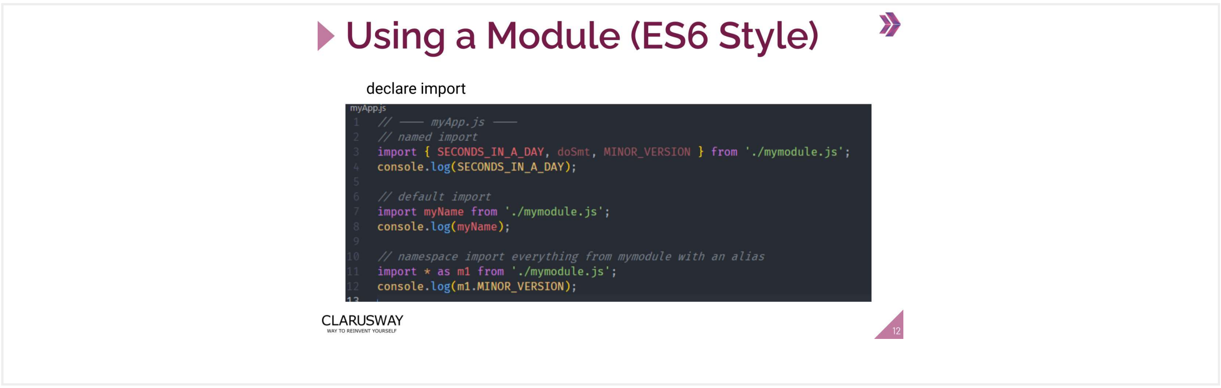

Using a Module (ES6 Style)

declare import

myApp.js

```javascript
// —— myApp.js ——
// named import
import { SECONDS_IN_A_DAY, doSmt, MINOR_VERSION } from './mymodule.js';
console.log(SECONDS_IN_A_DAY);

// default import
import myName from './mymodule.js';
console.log(myName);

// namespace import everything from mymodule with an alias
import * as m1 from './mymodule.js';
console.log(m1.MINOR_VERSION);
```

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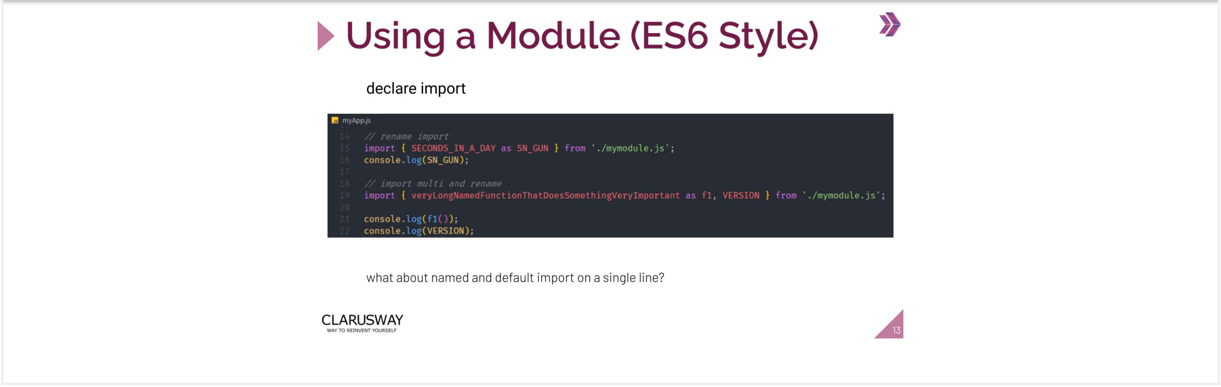

Using a Module (ES6 Style)

declare import

myApp.js

```javascript
// rename import
import { SECONDS_IN_A_DAY as SN_GUN } from './mymodule.js';
console.log(SN_GUN);

// import multi and rename
import { veryLongNamedFunctionThatDoesSomethingVeryImportant as f1, VERSION } from './mymodule.js';

console.log(f1());
console.log(VERSION);
```

what about named and default import on a single line?

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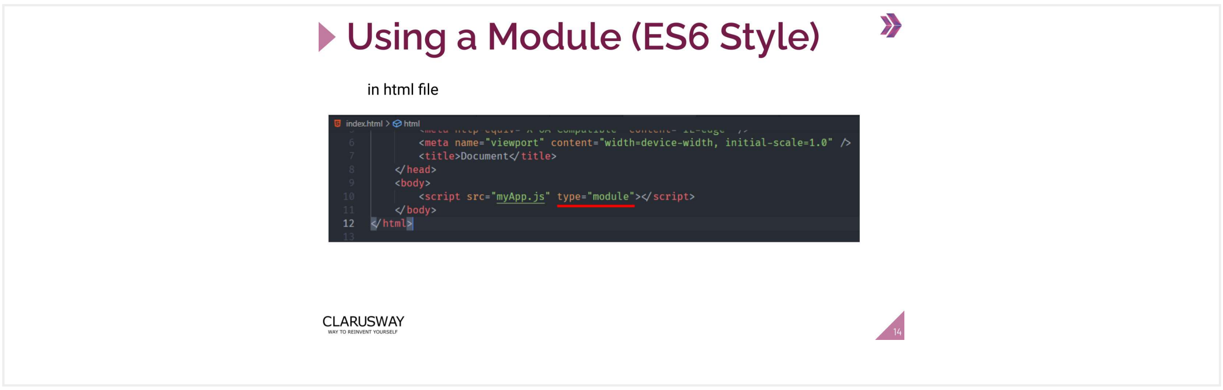

Using a Module (ES6 Style)

in html file

index.html > html

```
        <meta name="viewport" content="width=device-width, initial-scale=1.0" />
        <title>Document</title>
    </head>
    <body>
        <script src="myApp.js" type="module"></script>
    </body>
</html>
```

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1 JavaScript Code Compatibility

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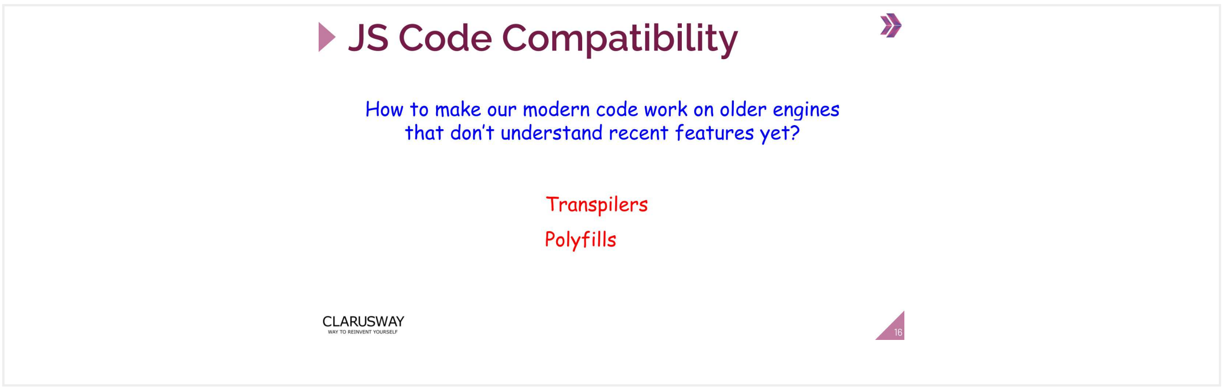

JS Code Compatibility

How to make our modern code work on older engines
that don't understand recent features yet?

Transpilers

Polyfills

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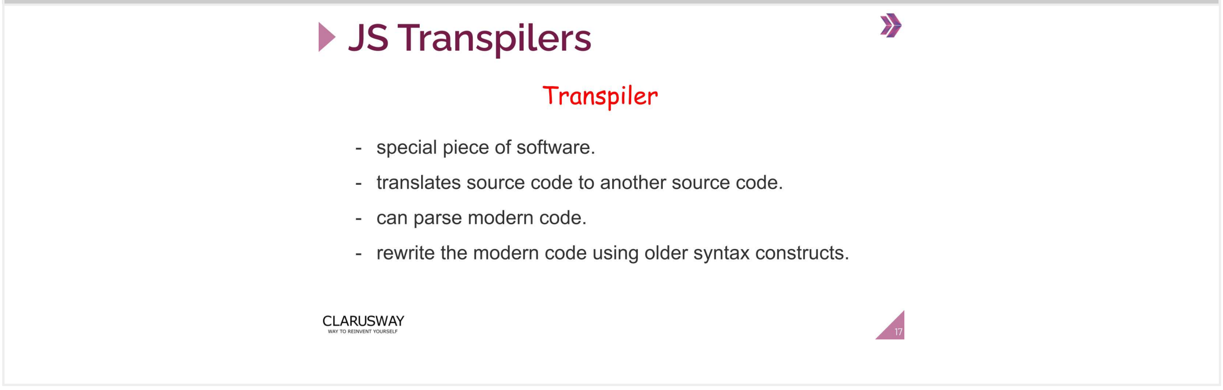

JS Transpilers

Transpiler

- special piece of software.
- translates source code to another source code.
- can parse modern code.
- rewrite the modern code using older syntax constructs.

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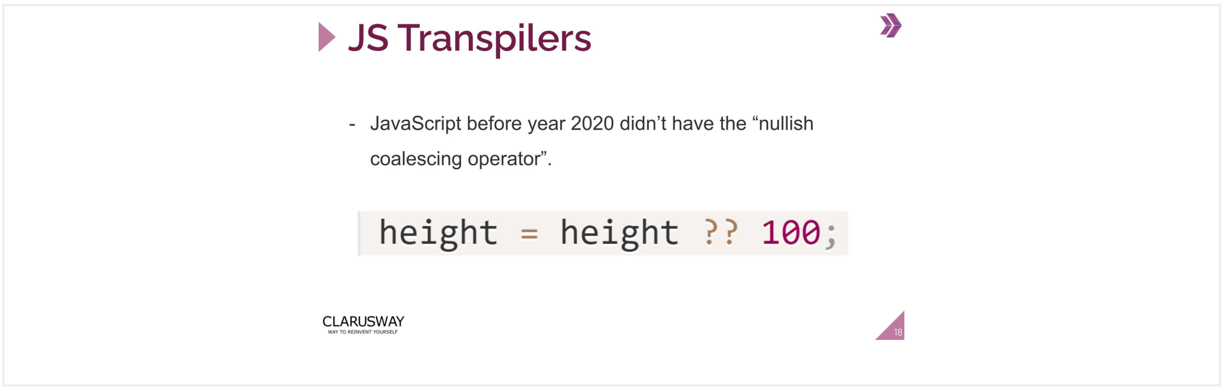

JS Transpilers

- JavaScript before year 2020 didn’t have the “nullish coalescing operator”.

```
height = height ?? 100;
```

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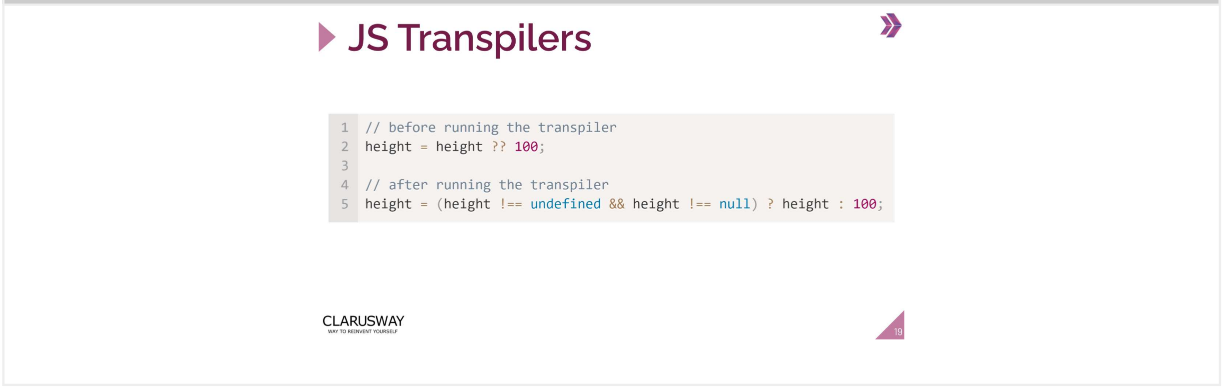

JS Transpilers

```
// before running the transpiler
height = height ?? 100;

// after running the transpiler
height = (height !== undefined && height !== null) ? height : 100;
```

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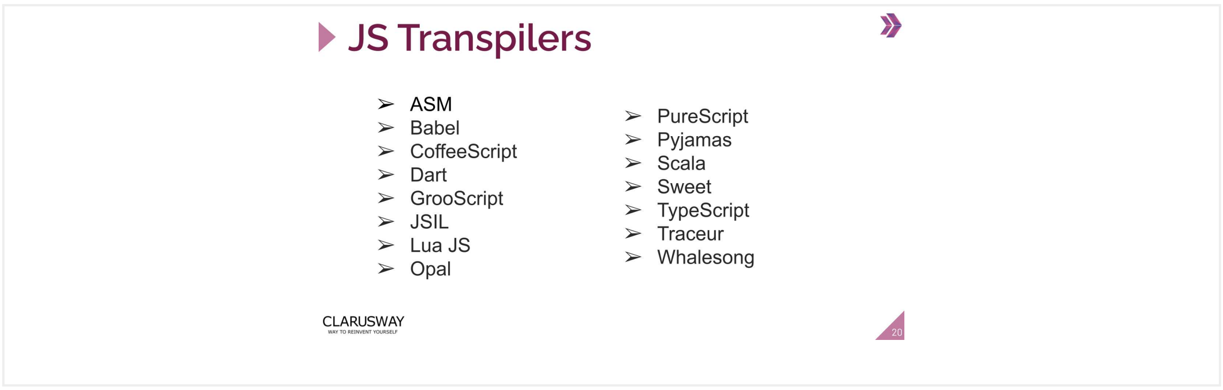

JS Transpilers

- ASM
- Babel
- CoffeeScript
- Dart
- GrooScript
- JSIL
- Lua JS
- Opal
- PureScript
- Pyjamas
- Scala
- Sweet
- TypeScript
- Traceur
- Whalesong

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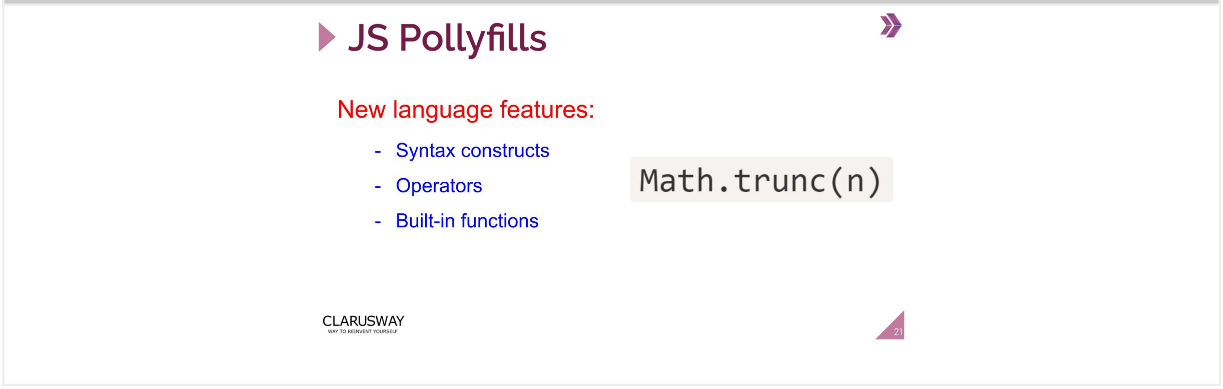

JS Pollyfills

New language features:

- Syntax constructs
- Operators
- Built-in functions

```
Math.trunc(n)
```

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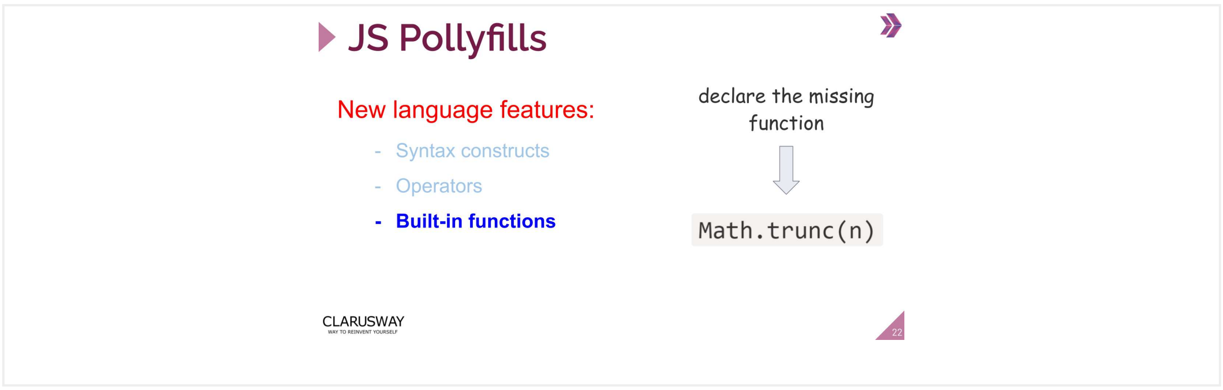

JS Pollyfills

New language features:

- Syntax constructs
- Operators
- **Built-in functions**

declare the missing function

`Math.trunc(n)`

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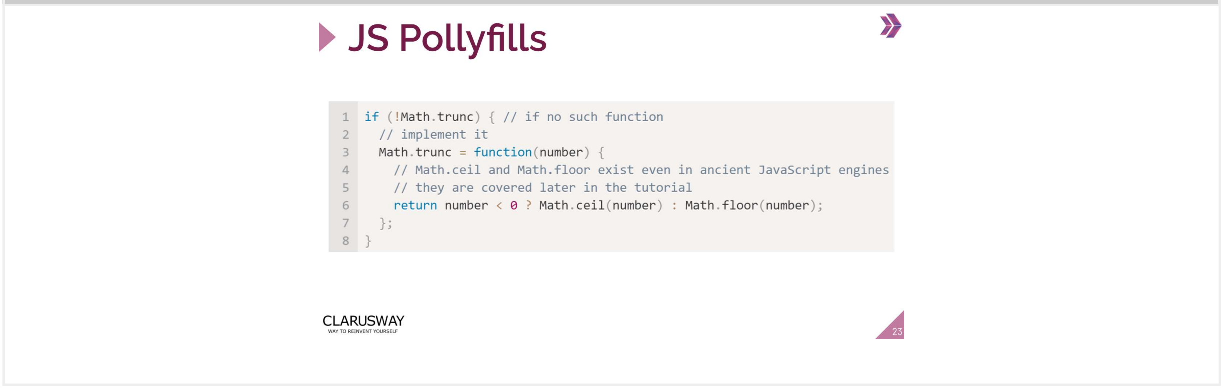

JS Pollyfills

```
if (!Math.trunc) { // if no such function
  // implement it
  Math.trunc = function(number) {
    // Math.ceil and Math.floor exist even in ancient JavaScript engines
    // they are covered later in the tutorial
    return number < 0 ? Math.ceil(number) : Math.floor(number);
  };
}
```

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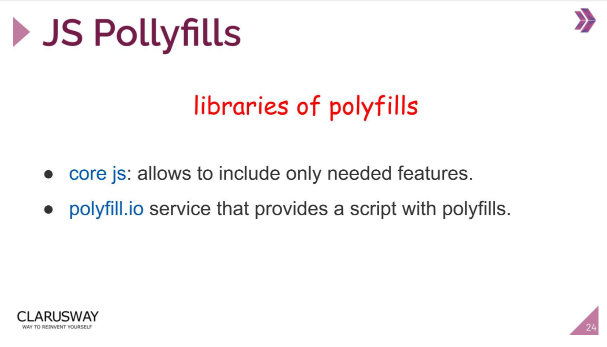

JS Pollyfills

libraries of polyfills

- core js: allows to include only needed features.
- polyfill.io service that provides a script with polyfills.

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Link(s) on this slide:
- https://github.com/zloirock/core-js
- http://polyfill.io/

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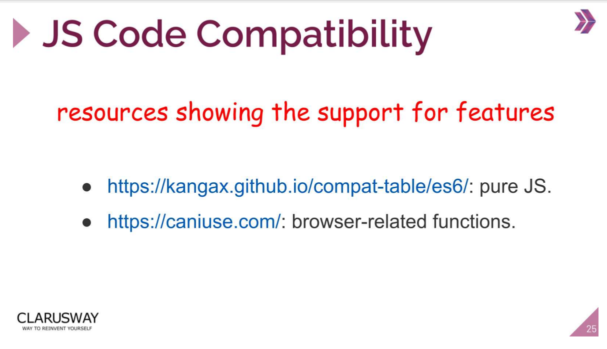

JS Code Compatibility

resources showing the support for features

- https://kangax.github.io/compat-table/es6/: pure JS.
- https://caniuse.com/: browser-related functions.

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Link(s) on this slide:
- https://kangax.github.io/compat-table/es6/
- https://caniuse.com/

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Link(s) on this slide:

- https://create.kahoot.it/details/02-node-js-module/12e6f3f0-0ecc-44f1-8887-f950d944cce2

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