

FS19

WEB ENGINEERING & DESIGN 3

VUE

T. Bocek

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WED 3: Plan 2019 (32 Teilnehmende = 3 Übungsgruppen)

VW	KW	Dat	Vorlesung	Dozent
01	08	22.02.18	Admin, SPA Grundlagen	Bocek
02	09	01.03.18	SPA Grundlagen, PWA	Bocek
03	10	08.03.18	React	Stocker
04	11	15.03.18	React	Stocker
05	12	22.03.18	React / Redux	Stocker
06	13	29.03.18	Angular	Gehrig
07	14	05.04.18	Angular	Gehrig
08	15	12.04.18	Angular	Gehrig
-	16	19.04.18	Karfreitag	-
09	17	26.04.18	Angular	Gehrig
10	18	03.05.18	Vue.js	Bocek
11	19	10.05.18	Web Engineering mit ASP.NET	Gfeller
12	20	17.05.18	Web Engineering mit ASP.NET	Gfeller
13	21	24.05.18	SVG / Canvas / WebGL	Gfeller
14	22	31.05.18	Praxisvorträge	Bocek

Admin / Web Engineering In the News

■ Today Vue.js lecture

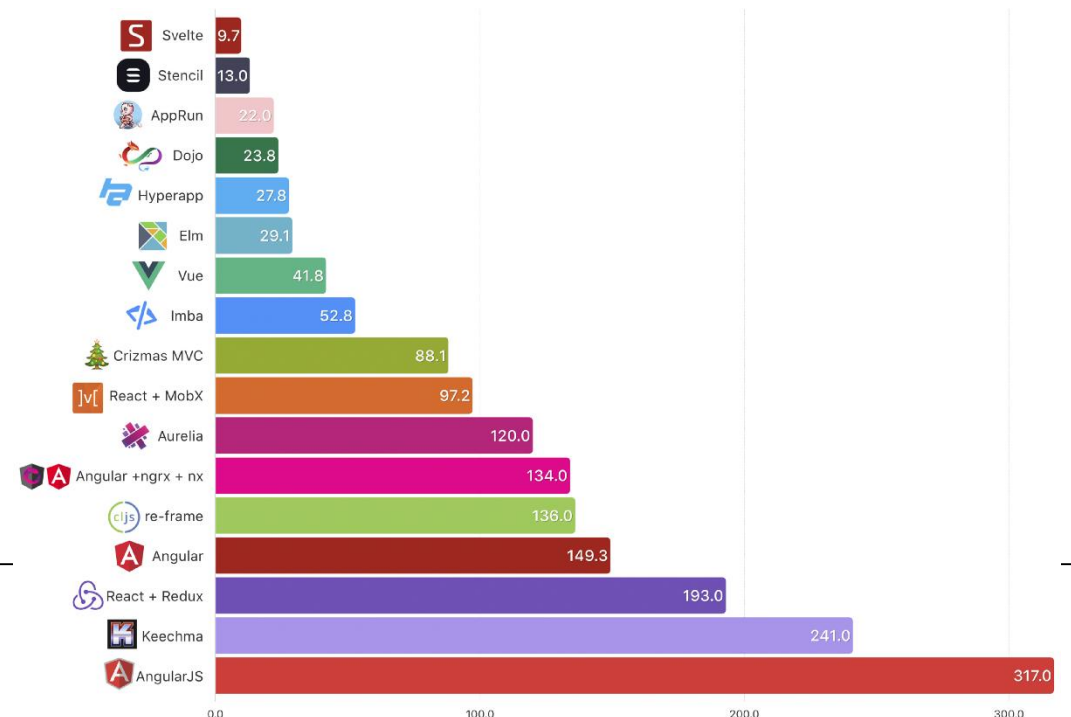
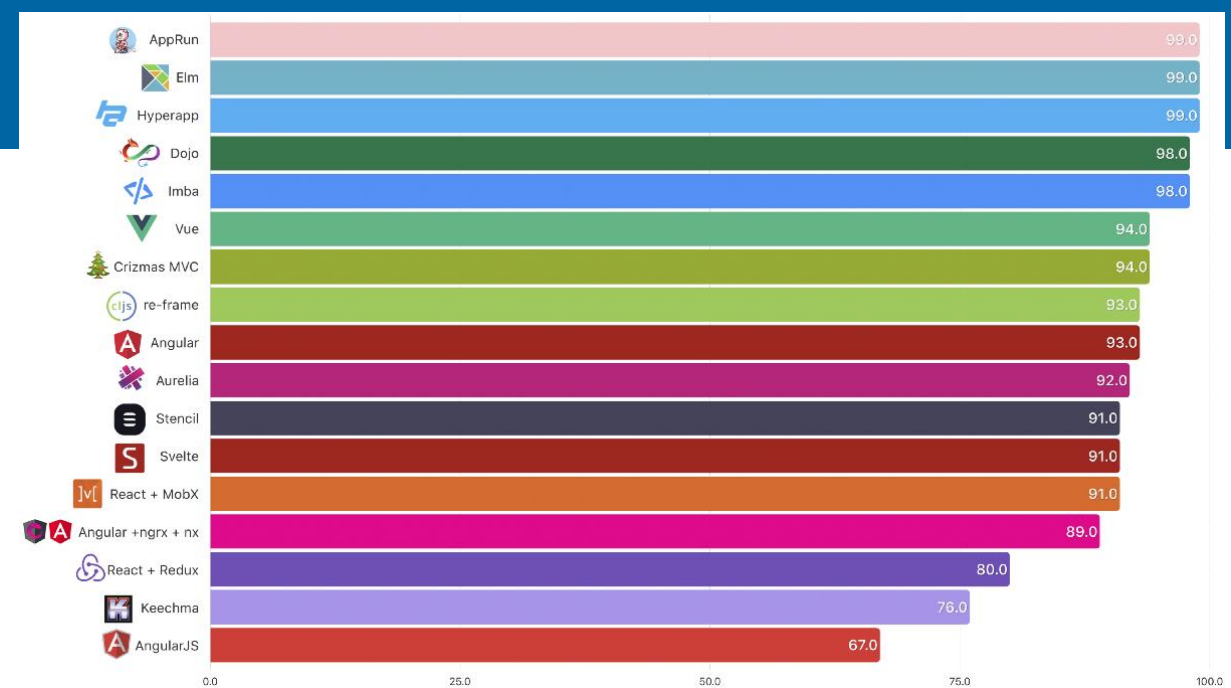
- [Exercises](#): work on your mini project
- “Sind 3er Gruppen erlaubt?
Ja, aber zusätzliche Abgabe mit Vue.js”

■ 31.05.2019 Praxisvorträge in the morning

- Mini Project Presentations right after

■ 08.04.2019: [A Real World Comparison of Front-End Frameworks with Benchmarks \(2019 update\)](#)

- Performance according to [Lighthouse Scoring Guide](#)
- Size and LoC comparison



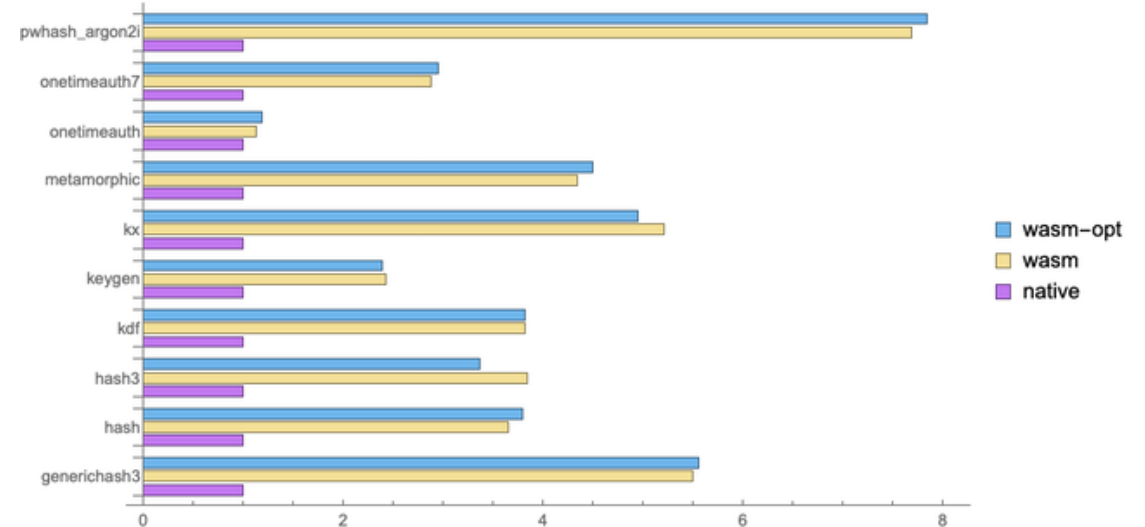
■ 09.04.2019: Developing a Javascript-free frontend

- “You probably don't need a “Progressive Web App.” Seriously evaluate if your app needs such complexity.”
- Rebuild SPA application without JavaScript (almost)
- Some tricks: “display: none;”
- Form validation with [HTML5](#)
- From 230KB down to 6KB

■ 09.04.2019: Benchmarking WebAssembly using libsodium

- Lecture 2, slide 13: “Execute at native speed”
- Libsodium, a cryptographic library for the browser, written in C

- Compiled to WebAssembly and benchmarked
- “Password hashing is 8 times slower”
- “While the overhead of WebAssembly is significant, these figures should be relativized. The original, native code is extremely fast ... Pure Javascript versions of libsodium are significantly slower ... ”



Learning Objectives

The learning objective of this lecture is to acquire knowledge and expertise in single page applications (SPA) and to be able to understand its implementation.

The students are able to...

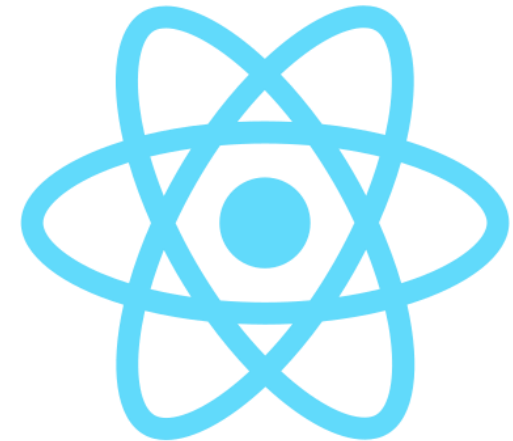
- ... know what Vue.js is
- ... understand the concepts of Vue.js
- ... write a simple WebApp in Vue.js

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Vue.js Introduction

- Vue (pronounced /vju:/, like view) is a progressive framework for building user interfaces.
- Released in February 2014
- ...On the other hand, Vue is also perfectly capable of powering sophisticated Single-Page Applications when used in combination with modern tooling and supporting libraries.
- 5 Best JavaScript Frameworks in 2017
 - Angular, React, Vue, Ember, Meteor
- Top 7 Most Popular JavaScript Frameworks in 2018
 - Angular, React, Ember, Aurelia, Meteor, Polymer, **Vue**
- **Vue – personal opinion: low learning curve**



Vue.js History

- Created by Evan You
- Worked for Google using AngularJS
 - “I figured, what if I could just extract the part that I really liked about Angular and build something really lightweight without all the extra concepts involved?”
- **“Vue is probably the most similar to React”**
 - “Angular, they try to be opinionated on all the problems”
 - “To date, Vue has been rewritten from the ground up twice.”
- Funding: patreon: 18K per month
 - No real marketing, writing blog posts / twitter
- **“There is not going to be this one true framework that just makes everyone happy.”**



Vue.js Introduction

■ Simple Vue example

- Load Vue library

■ Vue built-in template syntax

- {{name}}

■ Reactive

- The data and the DOM are now linked, and everything is now reactive
- `vm.name = 'hallo'`
- `#app` is mount point
 - [`vm.\$mount\('#app'\)`](#)

■ Example vue.html

```
<!DOCTYPE html>
<head>
  <meta charset="UTF-8">
  <title>Hello!</title>
  <script src="https://cdn.jsdelivr.net/npm/vue"></script>
</head>
<body>
  <div id="app">
    <h2 class="hello-title">Hello {{name}}!</h2>
  </div>
  <script type="text/javascript">
    var vm = new Vue({
      el: '#app',
      data: {
        name: 'Hello Vue!'
      },
      created: function () {
        fetch('/spa/'+window.location.hash.substring(1))
          .then(response => response.json())
          .then(body => {
            this.name = body.value;
          });
      }
    });
  </script>
</body>
</html>
```

Vue.js Introduction

■ {{Template Syntax}}

- “Mustache” syntax (double curly braces)
- If {{}} cannot be used (e.g. in attributes), use v-bind - `<div v-bind:id=“someId”></div>`
- `{{ counter + 1 }}` works as well

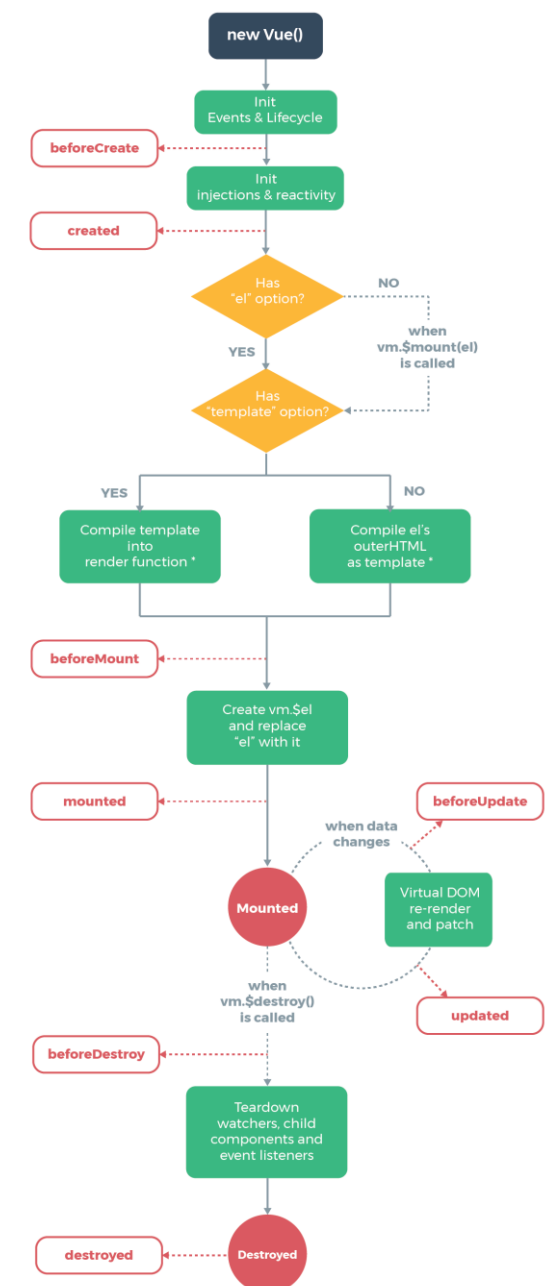
■ Lifecycle Hooks

- [Created](#)
- [Mounted](#)
- [Updated](#)
- [Destroyed](#)

■ Directives: two way data binding

- [v-model](#)

■ Example: vue-hooks.html



■ Directives

- [v-on // @](#) (vue2.html)
 - [Events](#), modifiers
- [v-once](#)
 - Rendered only once. Subsequent re-renders treated as static content and skipped
- [v-html](#)
- [v-if](#), [v-show](#), [v-for](#)
 - v-if: not in DOM, v-show: hidden
 - Groups with v-if on [<template>](#)

■ Computed vs Methods: Caching!

■ Watched Property

- Get notified when a property changes

■ Example: vue-input.html

changed from 10 to 9 Add 1

The button above has been clicked 10 times.

alt-c

Once counter: 0

Test

`<h1>Test</h1>`

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Vue.js Example

- Lets write a simple cryptocurrency portfolio manager
- Get a list of top 10 cryptocurrencies
 - <https://api.coinmarketcap.com/v1/ticker/?limit=10>
- More vue stuff
 - [v-for](#)
 - [filters](#)
- Store input in array: `vm.coins['BTC']`
- Example `vue-crypto.html`
 - Everything in on file

• Bitcoin 11174.6	5	55873 BTC
• Ethereum 954.591	44.5	42479.2995 ETH
• Ripple 1.15328	0	XRP
• Bitcoin Cash 1546.8	0	BCH
• Litecoin 225.73	11.1	2505.6029999999996 LTC
• Cardano 0.393631	0	ADA
• NEO 137.157	0	NEO
• Stellar 0.458337	34432.123	15781.515959451 XLM
• EOS 9.7699	0	EOS
• IOTA 2.12612	0	MIOTA

total: 116639 USD

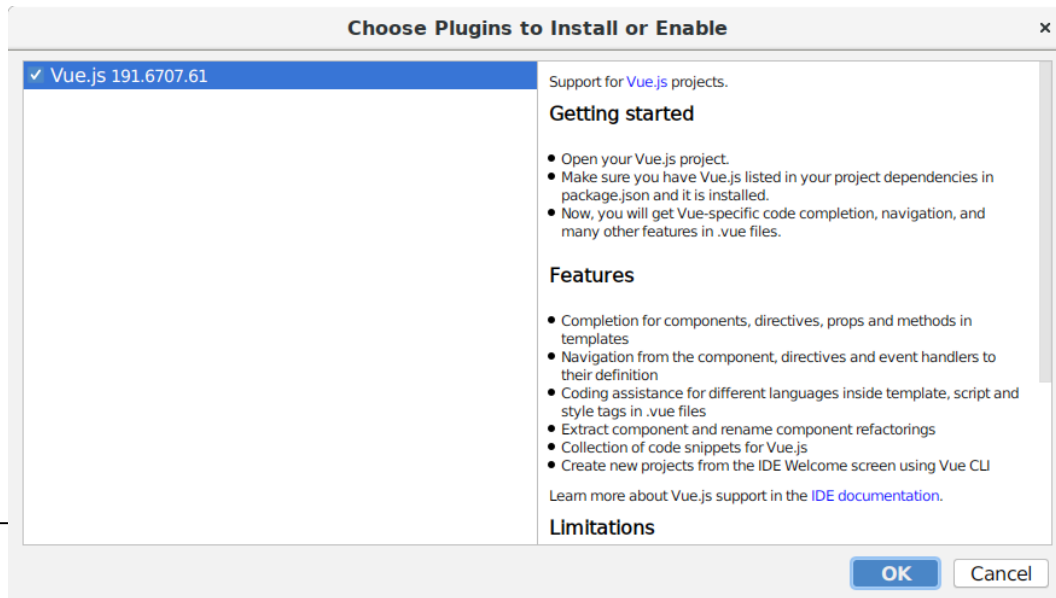
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Vue.js Example

■ Components

- Reusable
- Extend basic HTML elements
- Example single file components in components/
- ./node_modules/.bin/webpack
- ./node_modules/.bin/webpack-dev-server



// register

```
Vue.component('my-component', {  
  template: '<div>A custom component!</div>'  
})
```

// create a root instance

```
new Vue({  
  el: '#example'  
})
```

// html file

```
<div id="example">  
  <my-component></my-component>  
</div>
```

//will produce

```
<div id="example">  
  <div>A custom component!</div>  
</div>
```

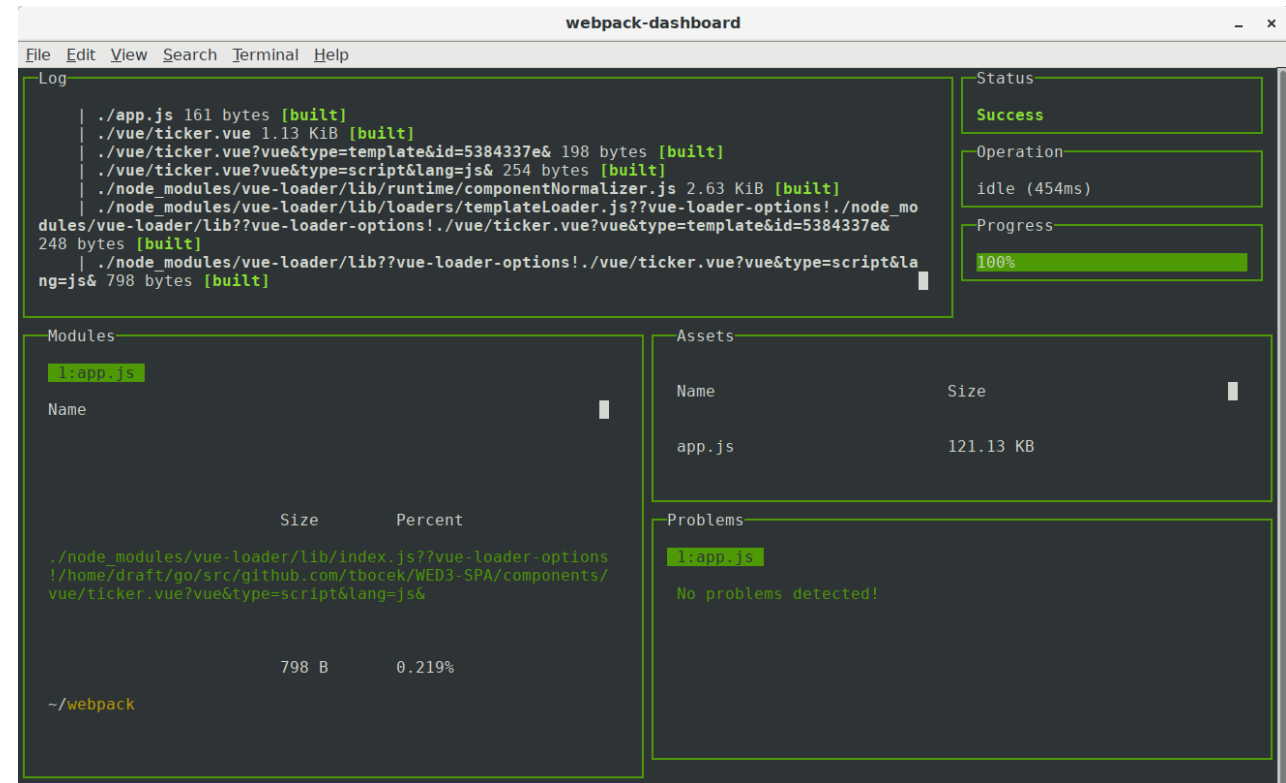
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Vue.js Example

■ Optimizing (current size: 386.44KB)

- Enable production mode
 - Enables minification
- Minify css
- Webpack can eliminate unused code
- Inline small images
- Recompress images
- Caching
- Split cache, dependencies change less often
- Lazy load code
- Monitor bundle size



■ Crypto Portfolio Management ([FS18](#))

- Usual suspects: app.js, index.html, package.json, webpack.config.js
- yarn install
- ./node_modules/.bin/webpack-dev-server
- portfolio-manager.vue
- Template: iterate over array of items from the user, iterate over options from coinmarketcap
- Lifecycle create: fetch coinmarketcap, fetch data from user, if no uuid given, create one
- “Add” – add to userCoinPortfolio – v-for get refreshed (data binding!) – also watched, thus, POST issued

```
func get(w http.ResponseWriter, r *http.Request, ps
httprouter.Params) {
    uuid := ps.ByName("uuid")
    w.Header().Set("Content-Type", "application/json")
    if len(m[uuid]) > 0 {
        io.Copy(w, strings.NewReader(m[uuid]))
    } else {
        w.Write([]byte("[]"))
    }
}

func post(w http.ResponseWriter, r *http.Request, ps
httprouter.Params) {
    uuid := ps.ByName("uuid")

    if b, err := ioutil.ReadAll(r.Body); err == nil {
        m[uuid] = string(b)
        w.WriteHeader(http.StatusOK)
        return
    }
    w.WriteHeader(http.StatusBadRequest)
}
```

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Questions?

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