BUILDING WEB APPS WITH VUE.JS

Raymond Camden

WHO AM I?

Raymond Camden

Developer Evangelist for HERE Technologies

Blogging at raymondcamden.com

Tweeting at raymondcamden

GAMEPLAN

Go over "requirements"

Talk about Vue at a high level (somewhat quick!)

Vue Syntax (basic stuff, but a lot of em!)

Components

Working with the CLI and Applications

Routing

Vuex (State management)

Vue 3.0 – What to Expect

Wrap Up

REQUIREMENTS

Assets (most code, slide deck, etc) - https://github.com/cfjedimaster/vue-workshop

Exercises:

- An editor (any editor is fine but Visual Studio Code is best)
- Or Codepen (codepen.io) or Code Sandbox (codesandbox.io)
- A web server (npm i -g httpster)

Web browser

WHY VUE?

Let’s back up…

SIMPLE

NO BUILD PROCESS

SCALABLE

QUICK VUE FACTS

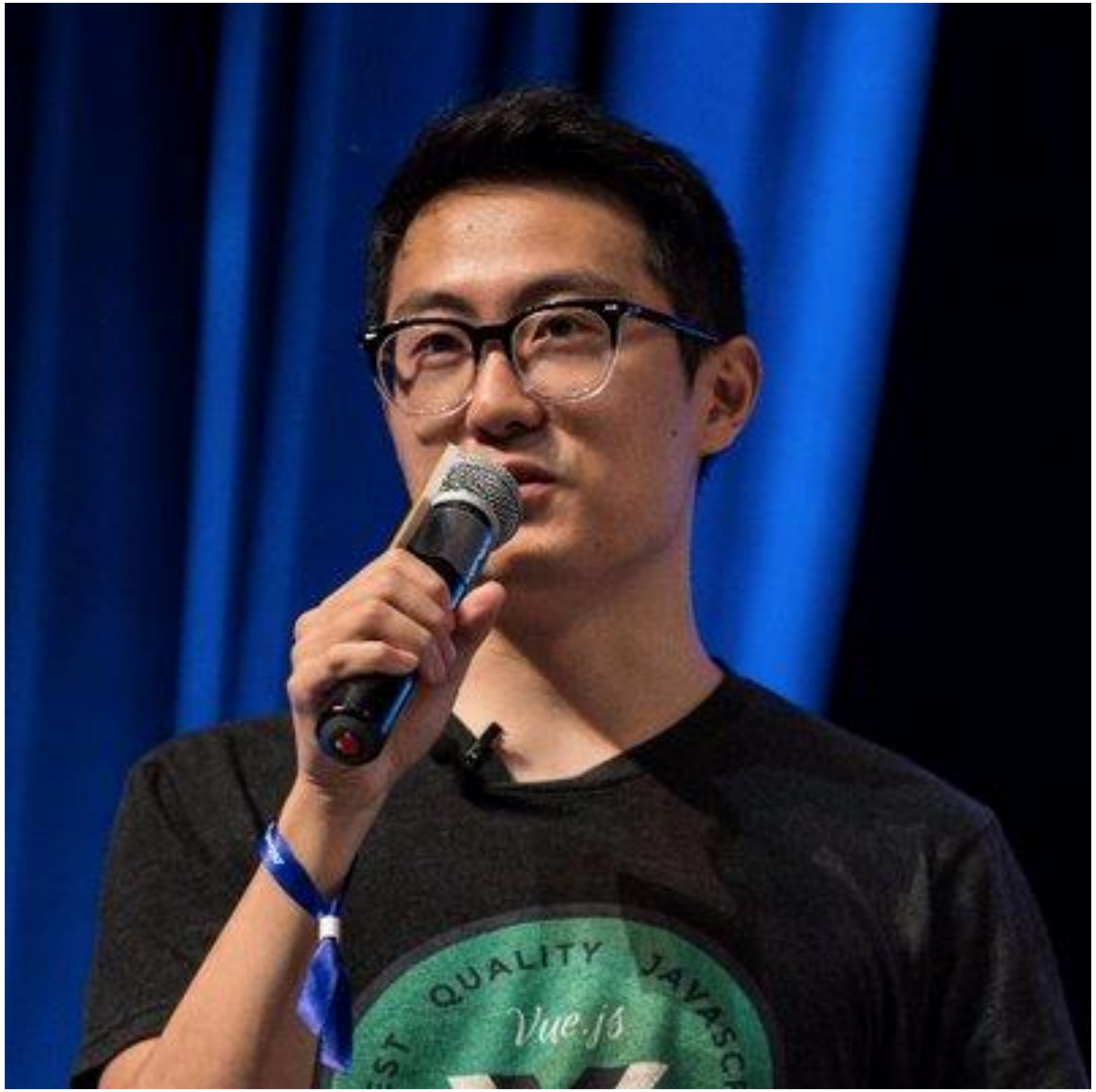
Created by Evan You (@youyuxi)

Released in February of 2014

"Currently" is version 2.6.11

Main site: vuejs.org

GitHub: https://github.com/vuejs



BRACE YOURSELF
VUE 3 IS COMING
imgflip.com

WHAT DOES VUE DO?

Two-way binding between your DOM and JavaScript

Template Language (aka Declarative Rendering)

And I know I said this - but it does more. A lot more.

INSTALLATION

npm install

cli install

Download from site

Copy and paste a script tag FTW!!!!!1!

<SCRIPT> STYLE

```html
<!-- dev -->
<script src="https://cdn.jsdelivr.net/npm/vue/dist/vue.js"></script>

<!-- prod -->
<script src="https://cdn.jsdelivr.net/npm/vue@2.6.11"></script>
```

WRITE SOME CODE!

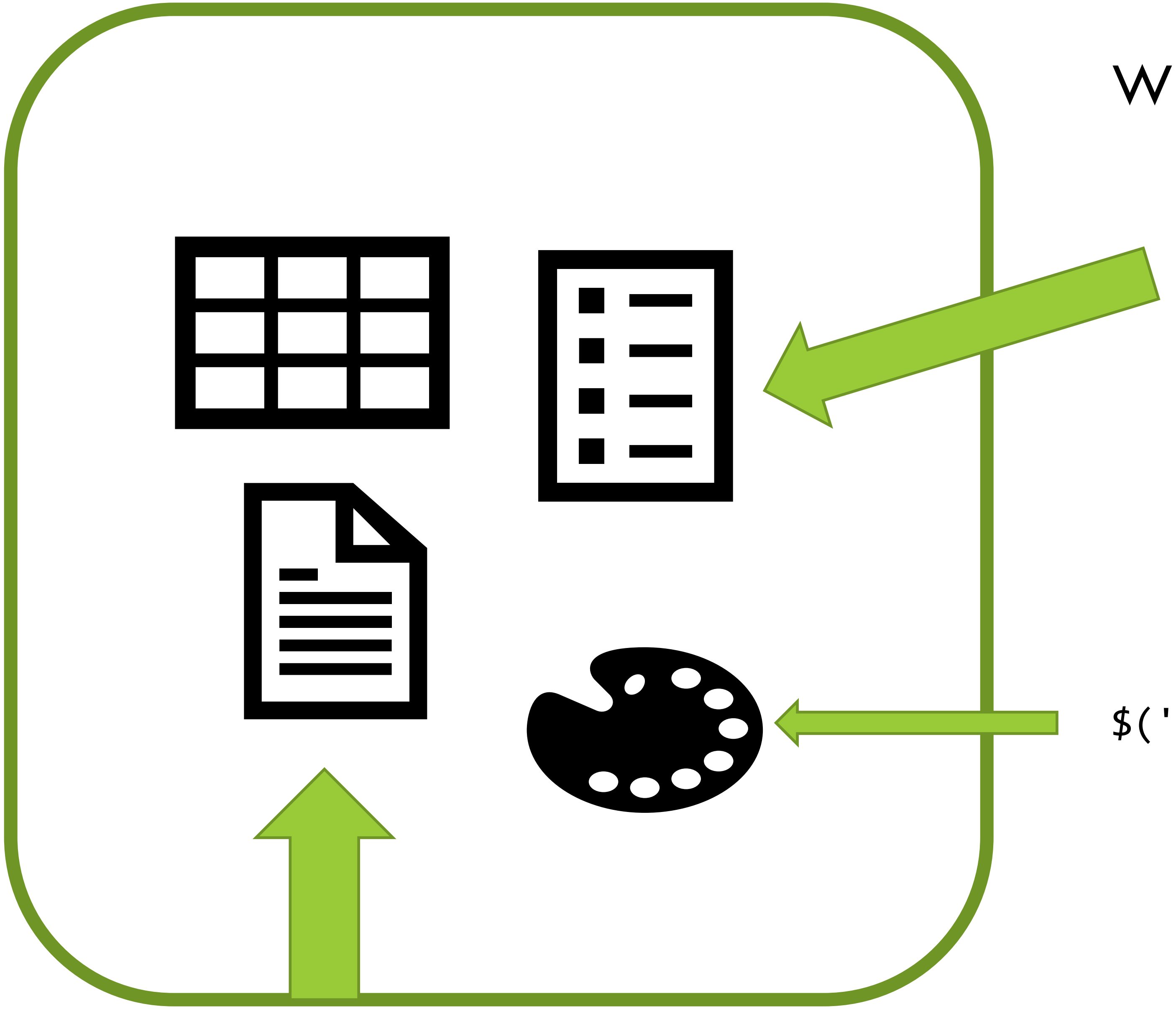
Identify where you're going to render stuff

Setup some data

Render that data

Add events (ie on this do that) and other fancy stuff

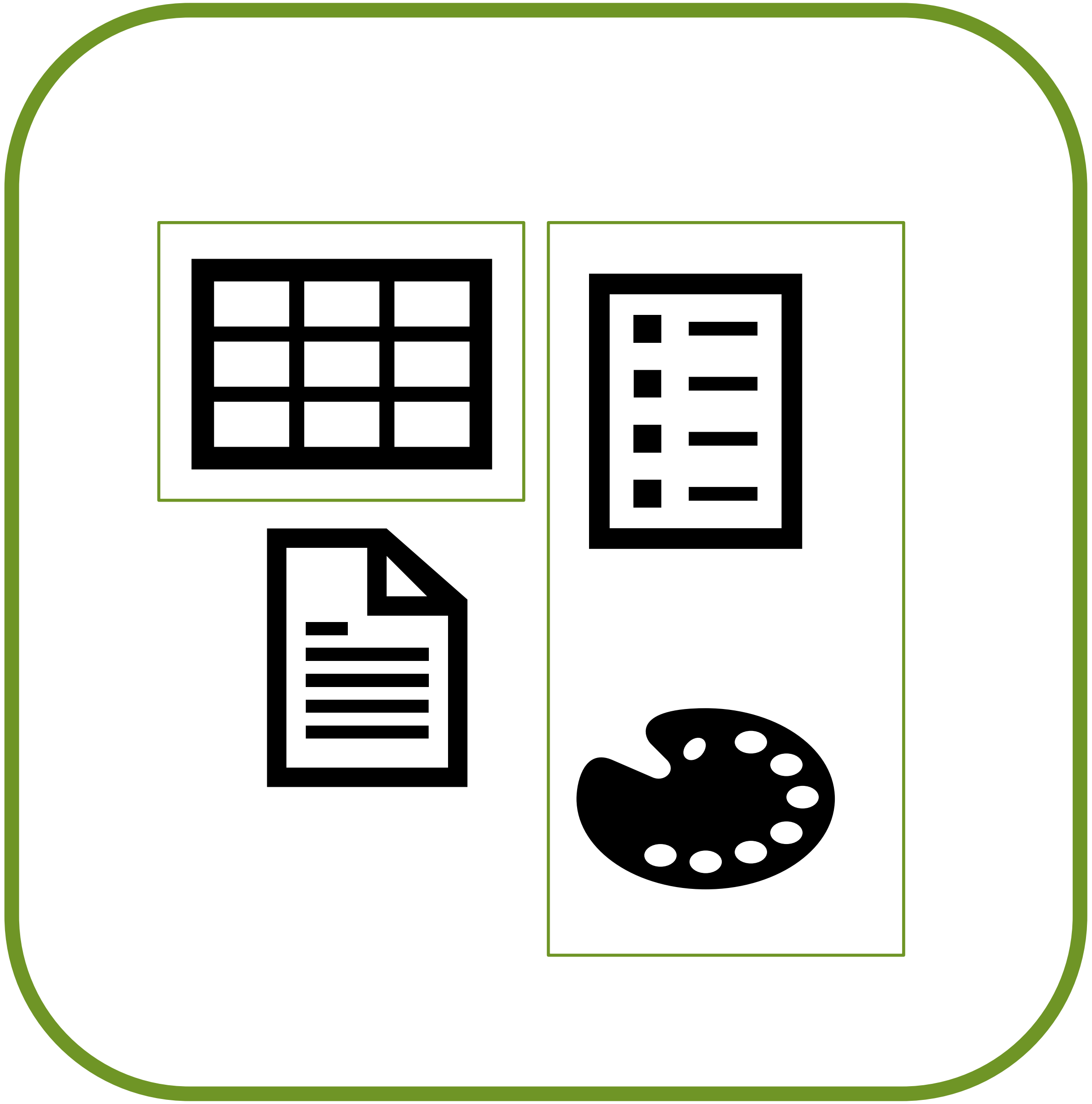
Willy Nilly DOM Manipulation



```
$('#somediv').html('woot');
```

```
$('#someotherdiv').val(2);
```

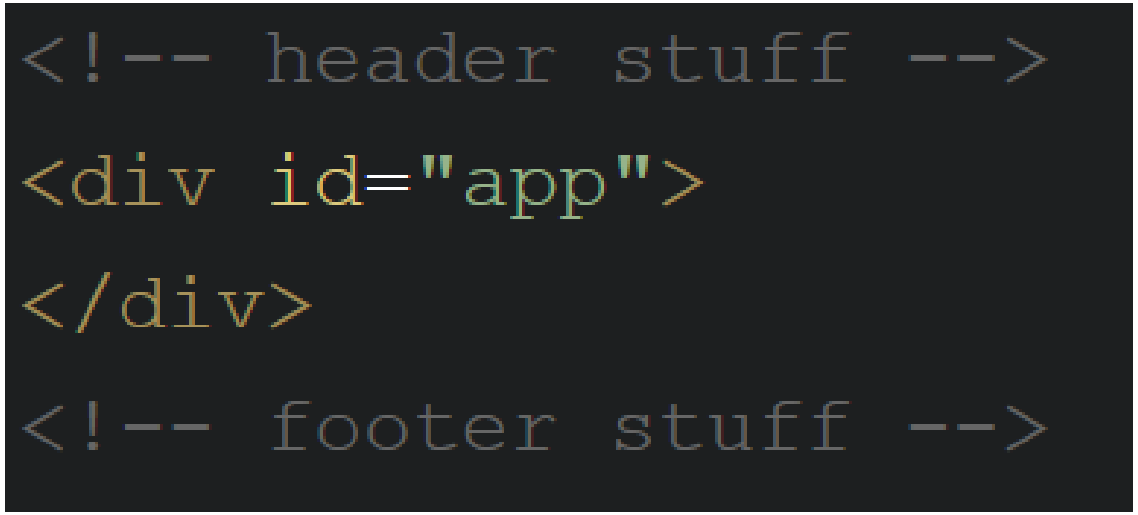
```
$('#yetanotherdiv').html('<b>This is awesome</b>');
```



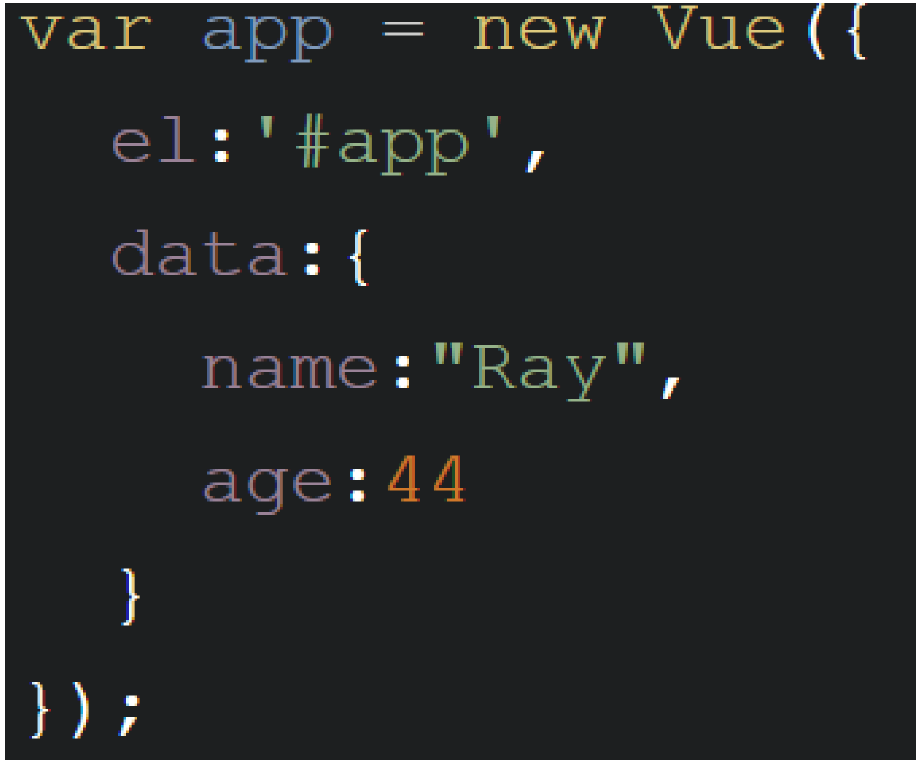
Defining Vue's Place...

EXAMPLES

http://bit.ly/rayvuedemos

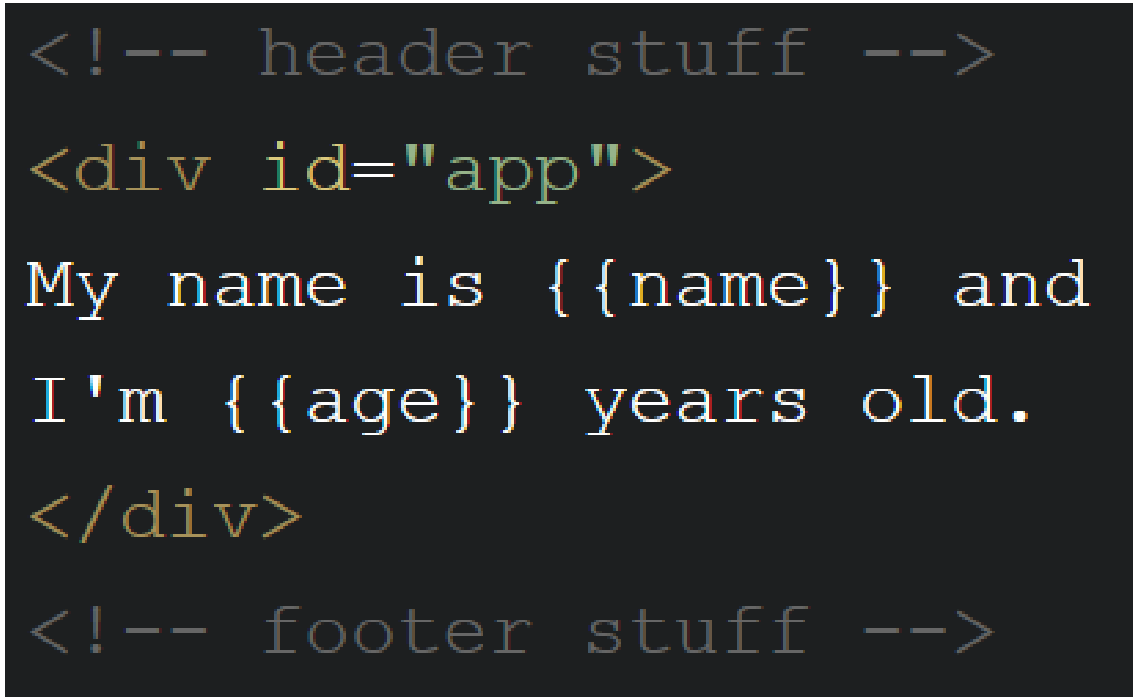


```html
<!-- header stuff -->
<div id="app">
</div>
<!-- footer stuff -->
```

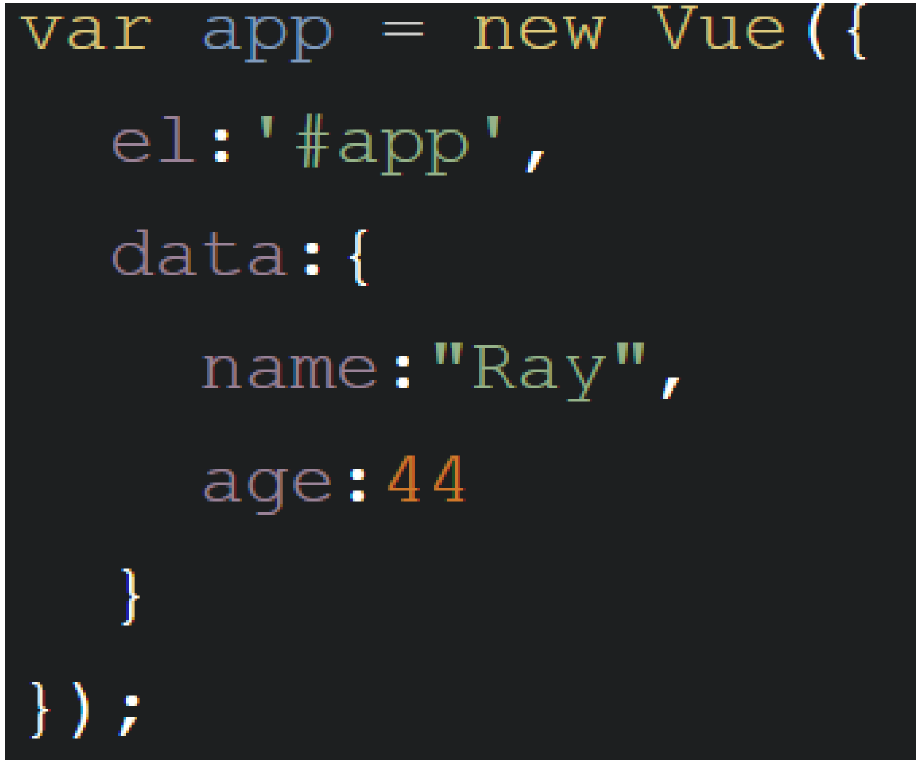


```javascript
var app = new Vue({
  el:'#app',
  data:{
    name:"Ray",
    age:44
  }
});
```

SOME CODE...



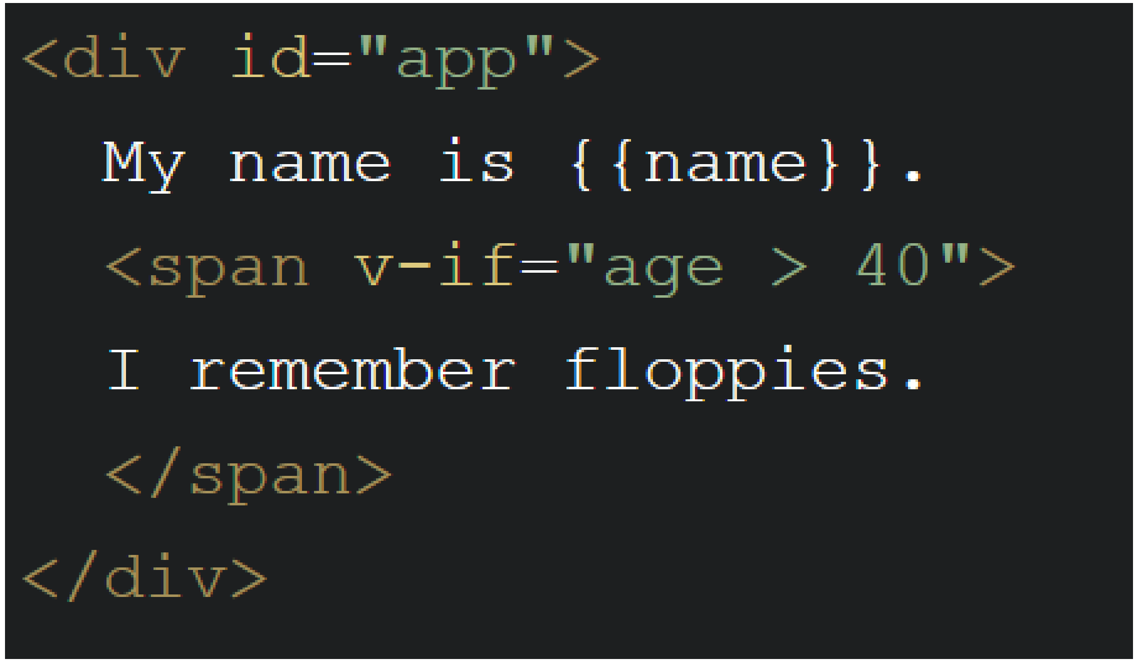
```
<!-- header stuff -->
<div id="app">
My name is {{name}} and
I'm {{age}} years old.
</div>
<!-- footer stuff -->
```



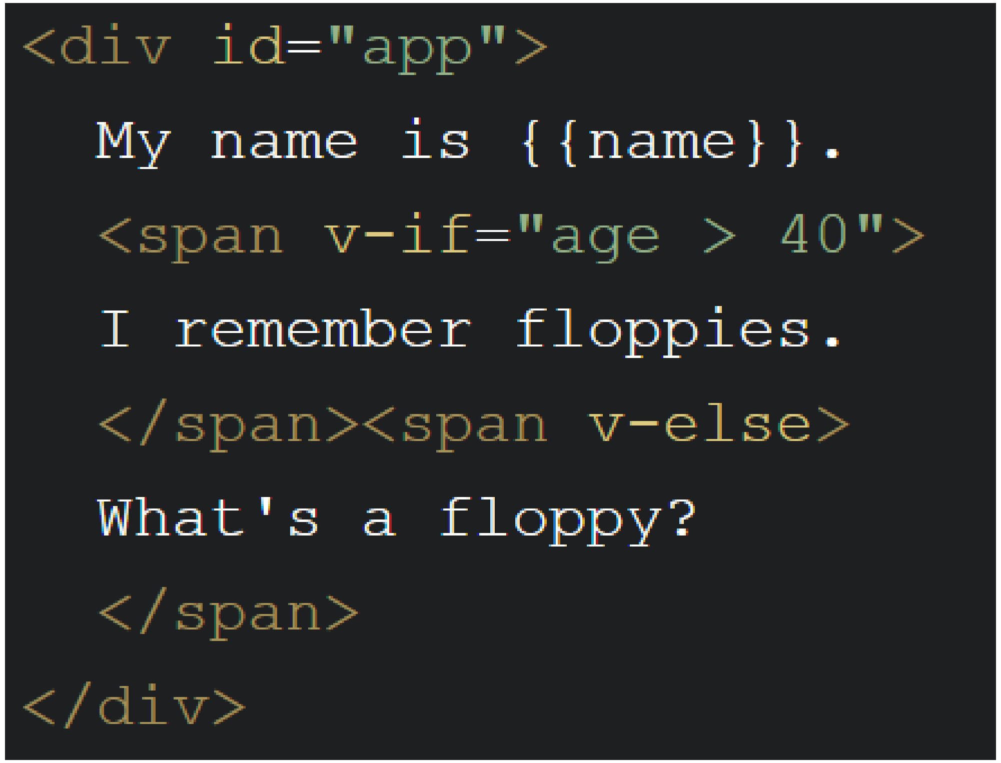
```
var app = new Vue({
  el:'#app',
  data:{
    name:"Ray",
    age:44
  }
});
```

SOME MORE CODE…

CODE PEN: FIRST DEMO



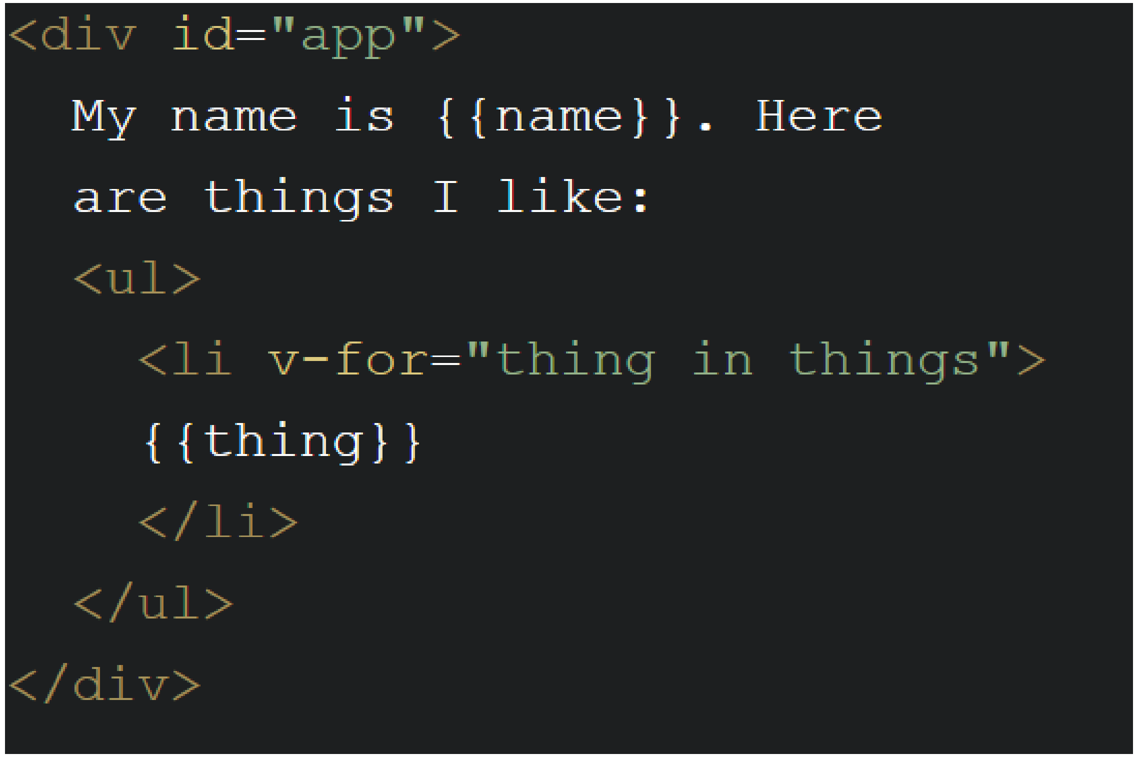
```
<div id="app">
  My name is {{name}}.
  <span v-if="age > 40">
  I remember floppies.
  </span>
</div>
```



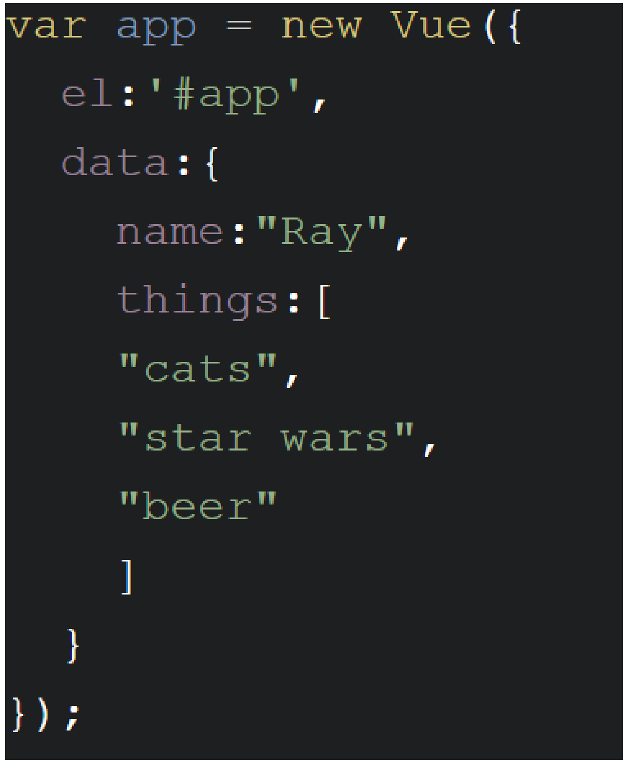
```
<div id="app">
  My name is {{name}}.
  <span v-if="age > 40">
  I remember floppies.
  </span><span v-else>
  What's a floppy?
  </span>
</div>
```

TEMPLATE DIRECTIVES - CONDITIONALS

CODE PEN: SECOND DEMO



```
<div id="app">
  My name is {{name}}. Here
  are things I like:
  <ul>
    <li v-for="thing in things">
    {{thing}}
    </li>
  </ul>
</div>
```



```
var app = new Vue({
  el:'#app',
  data:{
    name:"Ray",
    things:[
    "cats",
    "star wars",
    "beer"
    ]
  }
});
```

TEMPLATE DIRECTIVES - LOOPS

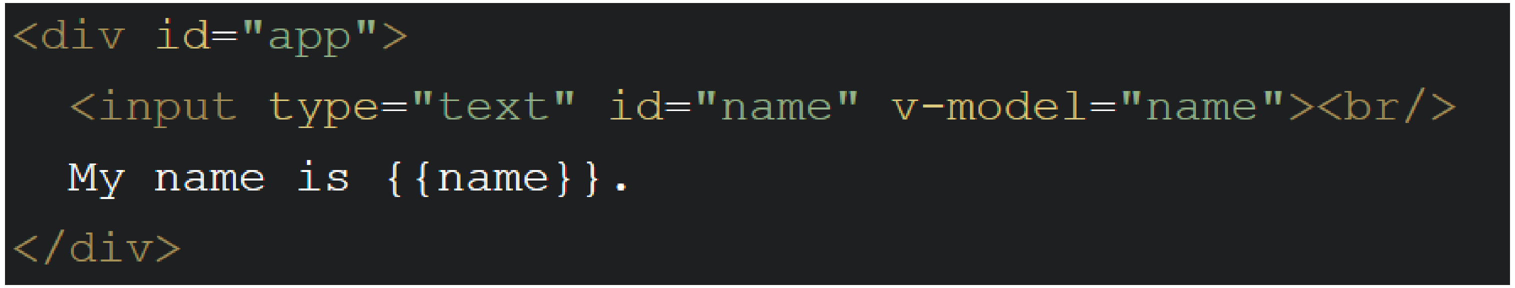
CODE PEN: THIRD DEMO

WORKING WITH FORM FIELDS

`v-model` links to data field

Works in all kinds of form fields

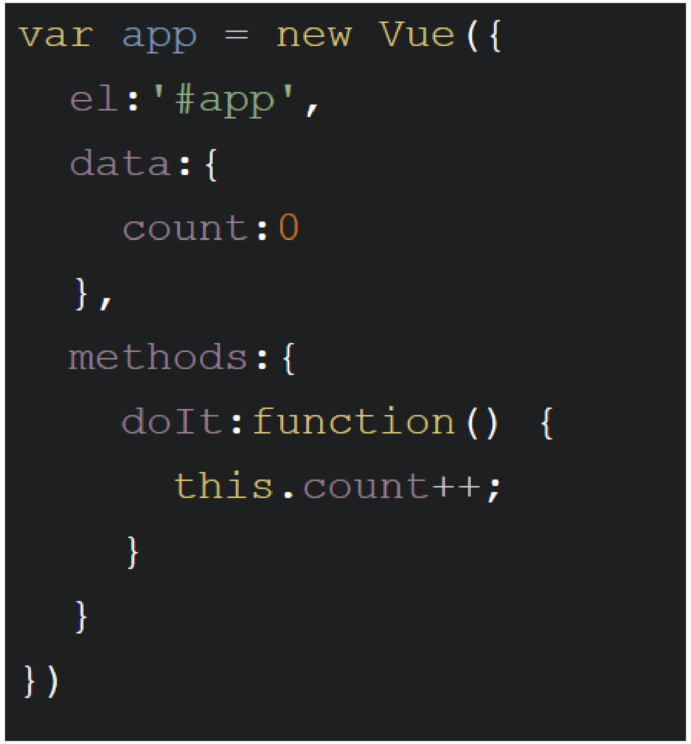
Bigger demo: https://www.raymondcamden.com/2020/01/27/vue-and-form-fields



```
<div id="app">
  <input type="text" id="name" v-model="name"><br/>
  My name is {{name}}.
</div>
```

CODE PEN: FOURTH DEMO

EVENTS



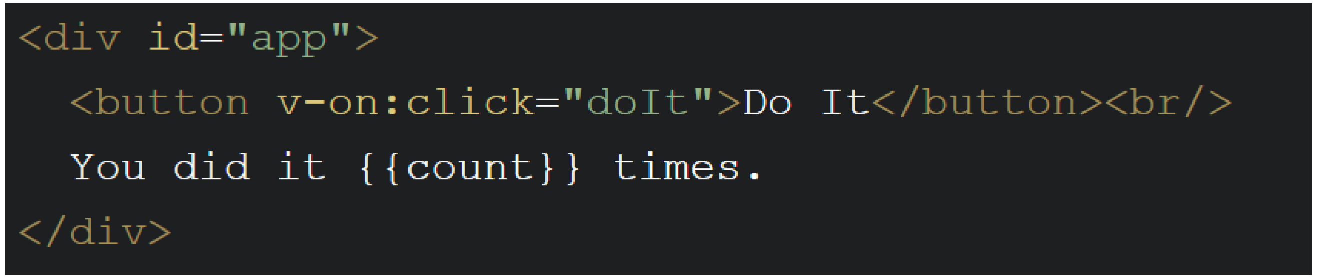
```
var app = new Vue({
  el:'#app',
  data:{
    count:0
  },
  methods:{
    doIt:function() {
      this.count++;
    }
  }
})
```

`v-on:click=“something”`

Defined in methods block of Vue instance

Easy to do modifiers (`v-on:submit.prevent`)

@click=“something”

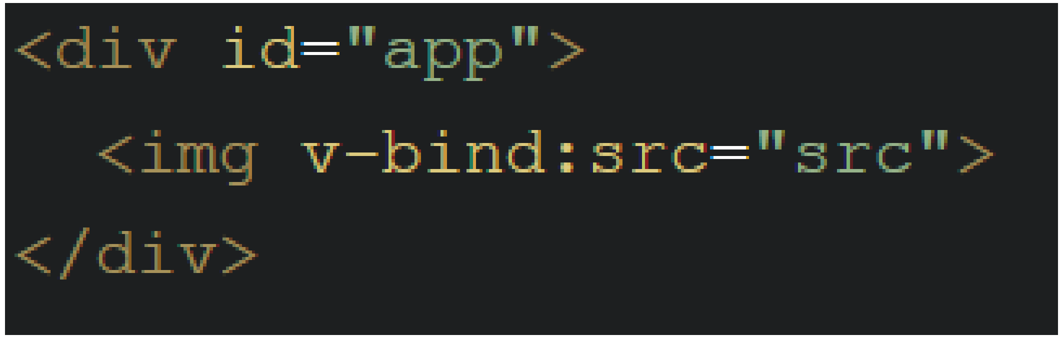


```
<div id="app">
  <button v-on:click="doIt">Do It</button><br/>
  You did it {{count}} times.
</div>
```

CODE PEN: FIFTH DEMO

ATTRIBUTE BINDING

```
v-bind:attribute=“value”
:attribute=“value”
v-bind:style="{bgcolor:curColor, font-style:textStyle}"
v-bind:class="{highlighted:isActive, color:appStatus}"
```



```
<div id="app">
  <img v-bind:src="src">
</div>
```

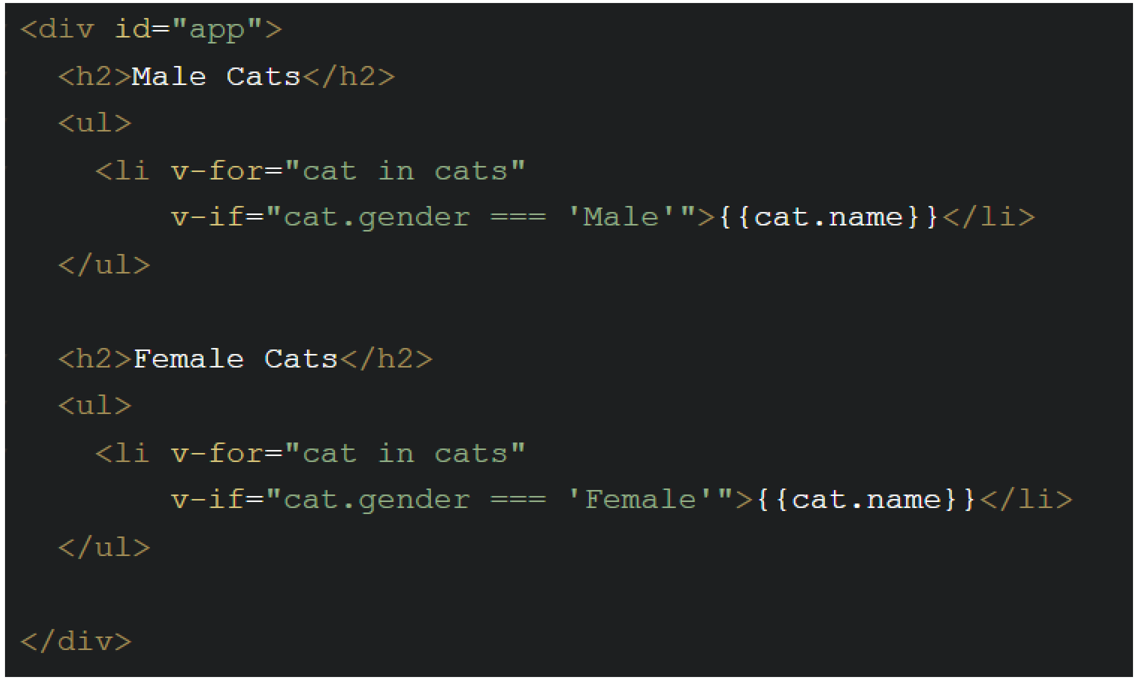
CODE PEN: SIXTH DEMO

COMPUTED PROPERTIES

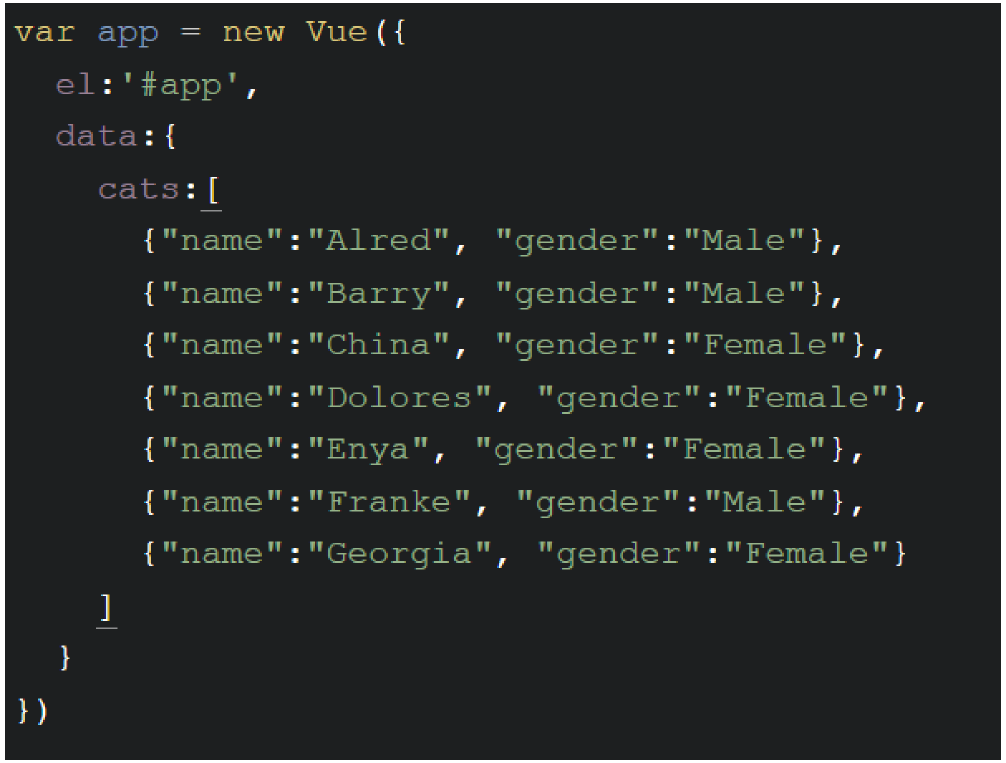
Virtual properties

Property X is based on real data A and B

Defined in the `computed` part of the Vue instance

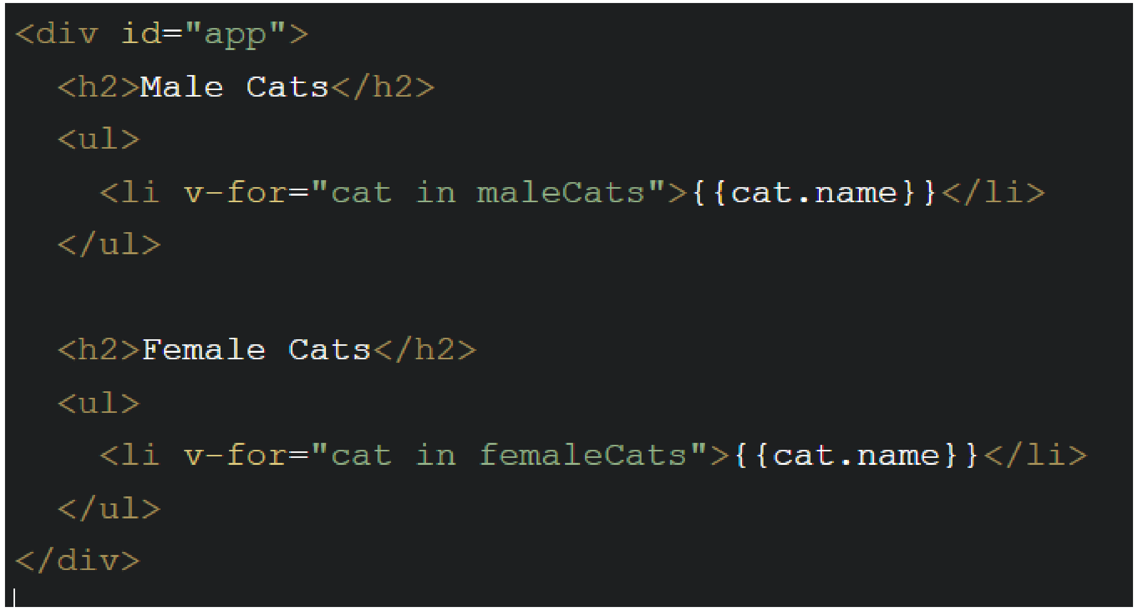


```
<div id="app">
  <h2>Male Cats</h2>
  <ul>
    <li v-for="cat in cats"
        v-if="cat.gender === 'Male'">{{cat.name}}</li>
  </ul>

  <h2>Female Cats</h2>
  <ul>
    <li v-for="cat in cats"
        v-if="cat.gender === 'Female'">{{cat.name}}</li>
  </ul>

</div>
```

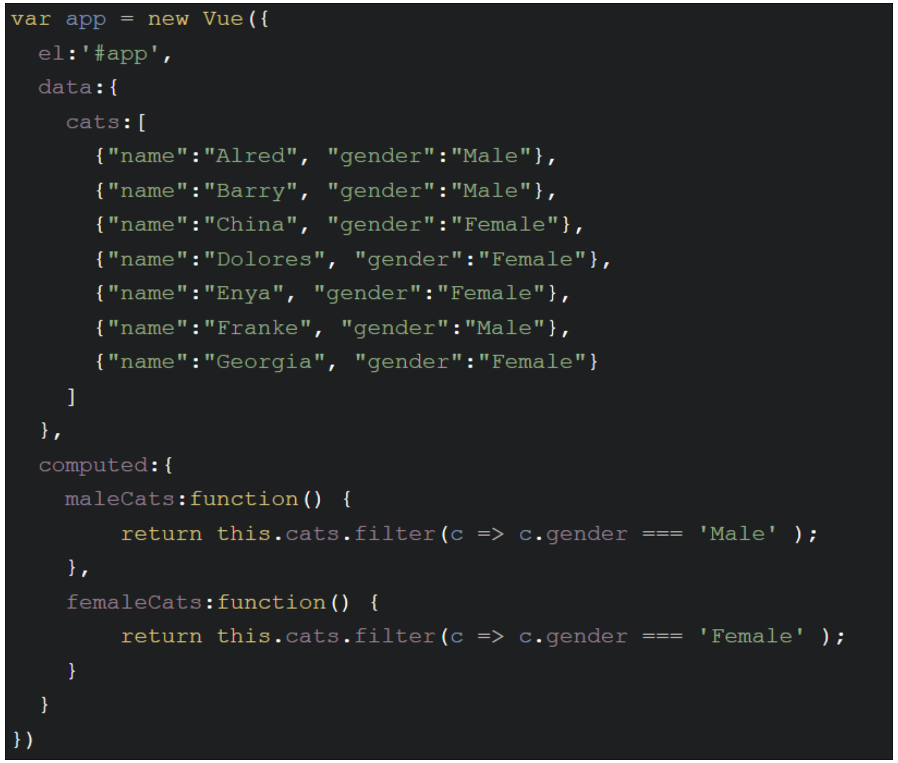


```
var app = new Vue({
  el:'#app',
  data:{
    cats:[
      {"name":"Alred", "gender":"Male"},
      {"name":"Barry", "gender":"Male"},
      {"name":"China", "gender":"Female"},
      {"name":"Dolores", "gender":"Female"},
      {"name":"Enya", "gender":"Female"},
      {"name":"Franke", "gender":"Male"},
      {"name":"Georgia", "gender":"Female"}
    ]
  }
})
```

EXAMPLE (BEFORE)



```
<div id="app">
  <h2>Male Cats</h2>
  <ul>
    <li v-for="cat in maleCats">{{cat.name}}</li>
  </ul>

  <h2>Female Cats</h2>
  <ul>
    <li v-for="cat in femaleCats">{{cat.name}}</li>
  </ul>
</div>
```



```
var app = new Vue({
  el:'#app',
  data:{
    cats:[
      {"name":"Alred", "gender":"Male"},
      {"name":"Barry", "gender":"Male"},
      {"name":"China", "gender":"Female"},
      {"name":"Dolores", "gender":"Female"},
      {"name":"Enya", "gender":"Female"},
      {"name":"Franke", "gender":"Male"},
      {"name":"Georgia", "gender":"Female"}
    ]
  },
  computed:{
    maleCats:function() {
        return this.cats.filter(c => c.gender === 'Male' );
    },
    femaleCats:function() {
        return this.cats.filter(c => c.gender === 'Female' );
    }
  }
})
```

EXAMPLE (AFTER)

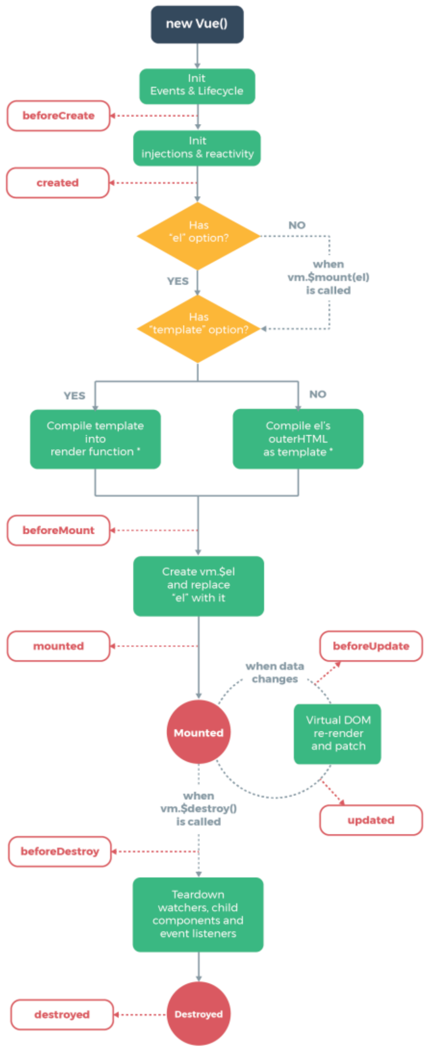
CODE PEN: SEVENTH DEMO

VUE LIFECYCLE EVENTS

Events that occur while a Vue instance is doing stuff

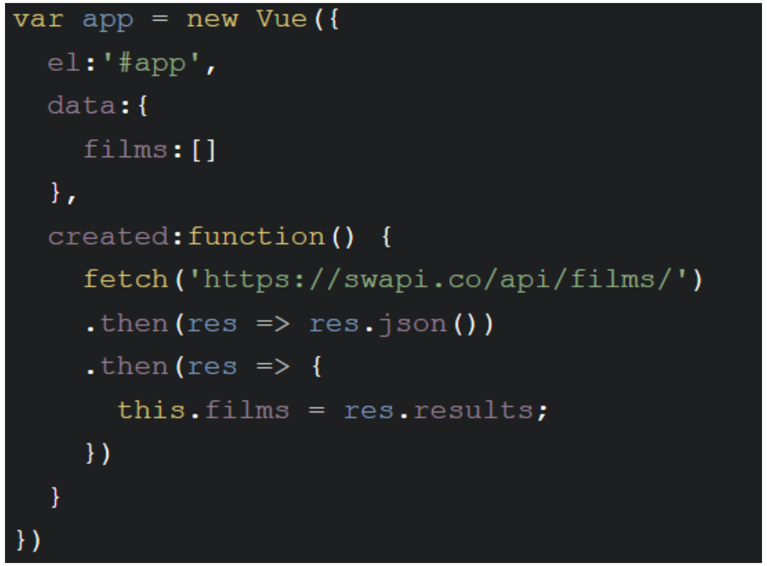
beforeCreate, created, beforeMount, mounted, beforeUpate, updated, activated, deactivated, beforeDestroy, destroyed, errorCaptured

https://vuejs.org/v2/api/#Options-Lifecycle-Hooks

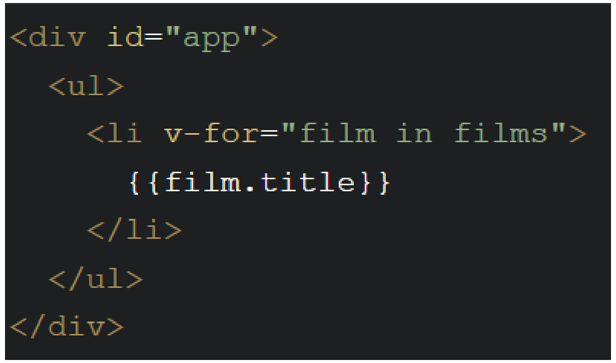


* template compilation is performed ahead-of-time if using a build step, e.g. single-file components

EXAMPLE



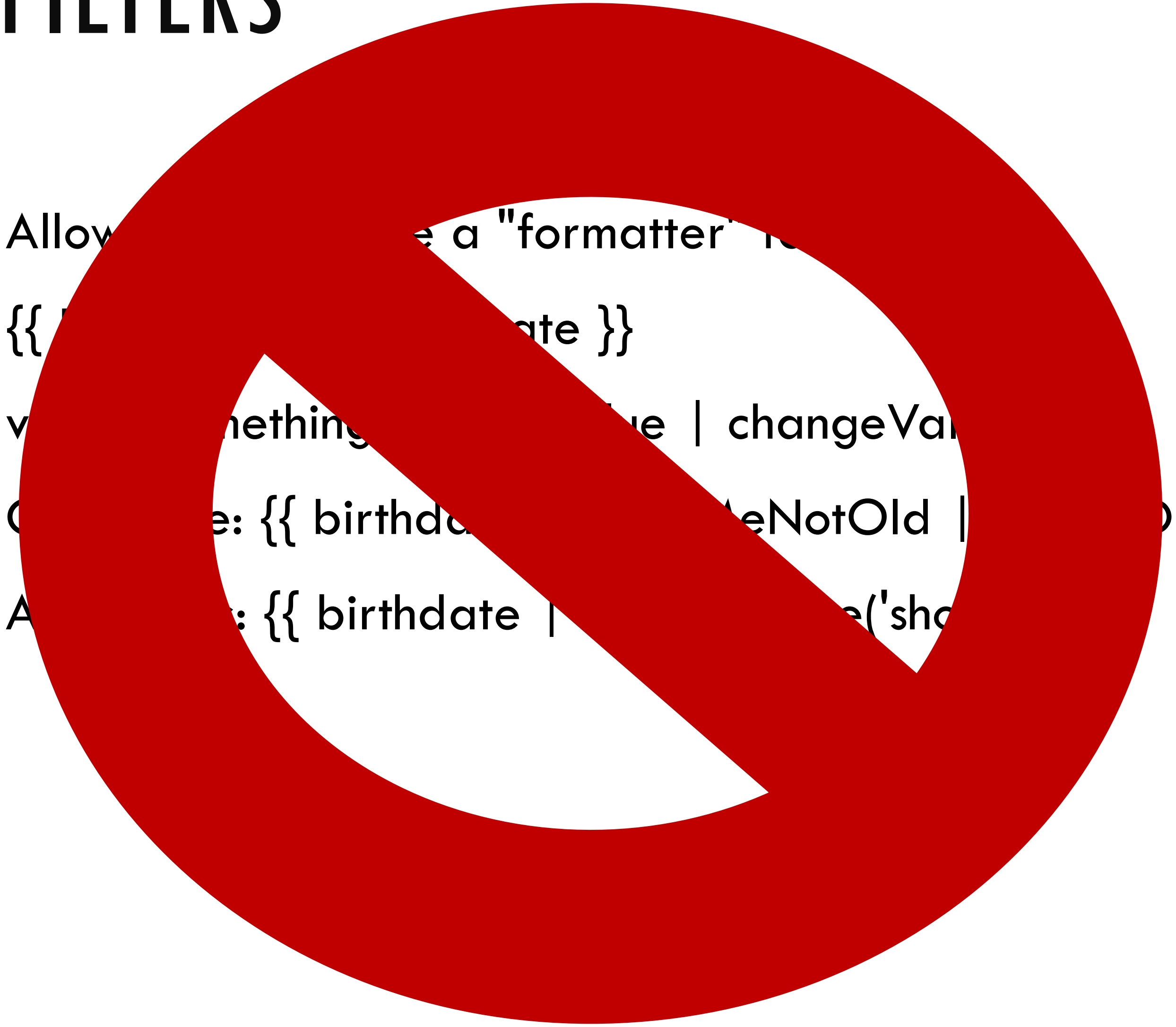
```
var app = new Vue({
  el:'#app',
  data:{
    films:[]
  },
  created:function() {
    fetch('https://swapi.co/api/films/')
    .then(res => res.json())
    .then(res => {
      this.films = res.results;
    })
  }
})
```



```
<div id="app">
  <ul>
    <li v-for="film in films">
      {{film.title}}
    </li>
  </ul>
</div>
```

CODE PEN: EIGHTH DEMO

FILTERS



Allow e a "formatter" fo

{{ ate }}

v nethin ue | changeVal

C e: {{ birthda eNotOld | ate }}

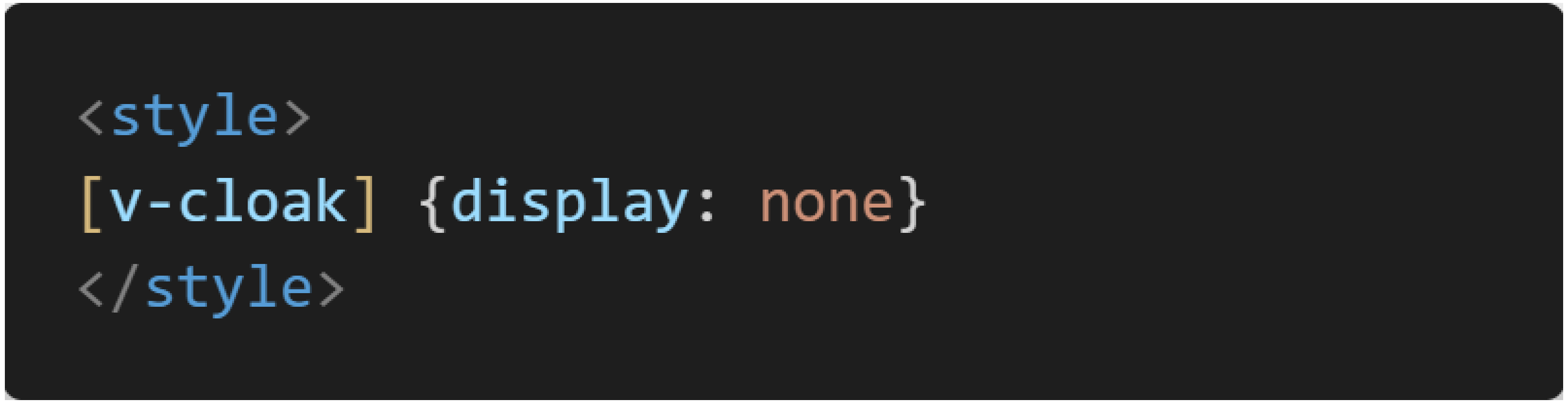
A : {{ birthdate | e('sho

QUICK TIP

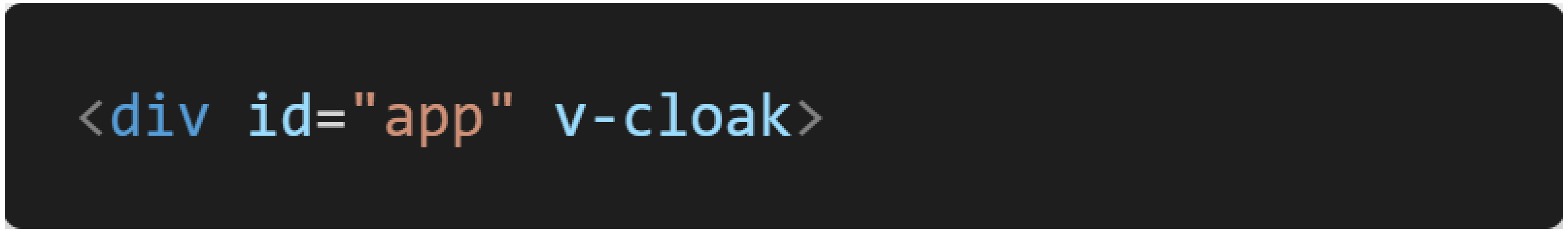
Hiding the FOUC (Flash of Unstyled Content

Add v-cloak to DOM item "holding" your app

Add a style declaration to hide it.



```
<style>
[v-cloak] {display: none}
</style>
```



```
<div id="app" v-cloak>
```

FULL EXAMPLE: FORM VALIDATION

Do I need to explain this?

Check on submit, report on top

More examples: https://vuejs.org/v2/cookbook/form-validation.html

FULL EXAMPLE: AJAX SEARCH

Accept user input

Send to remote API…

- https://www.openbrewerydb.org/documentation/03-search

Render responses

BREAK

COMPONENTS

Re-usable objects of awesome-ness

Template + Logic + Style = Component

Also solves one of HTML's most glaring problems…

<nicolas-cage>

COMPONENT PARTS

Register the name

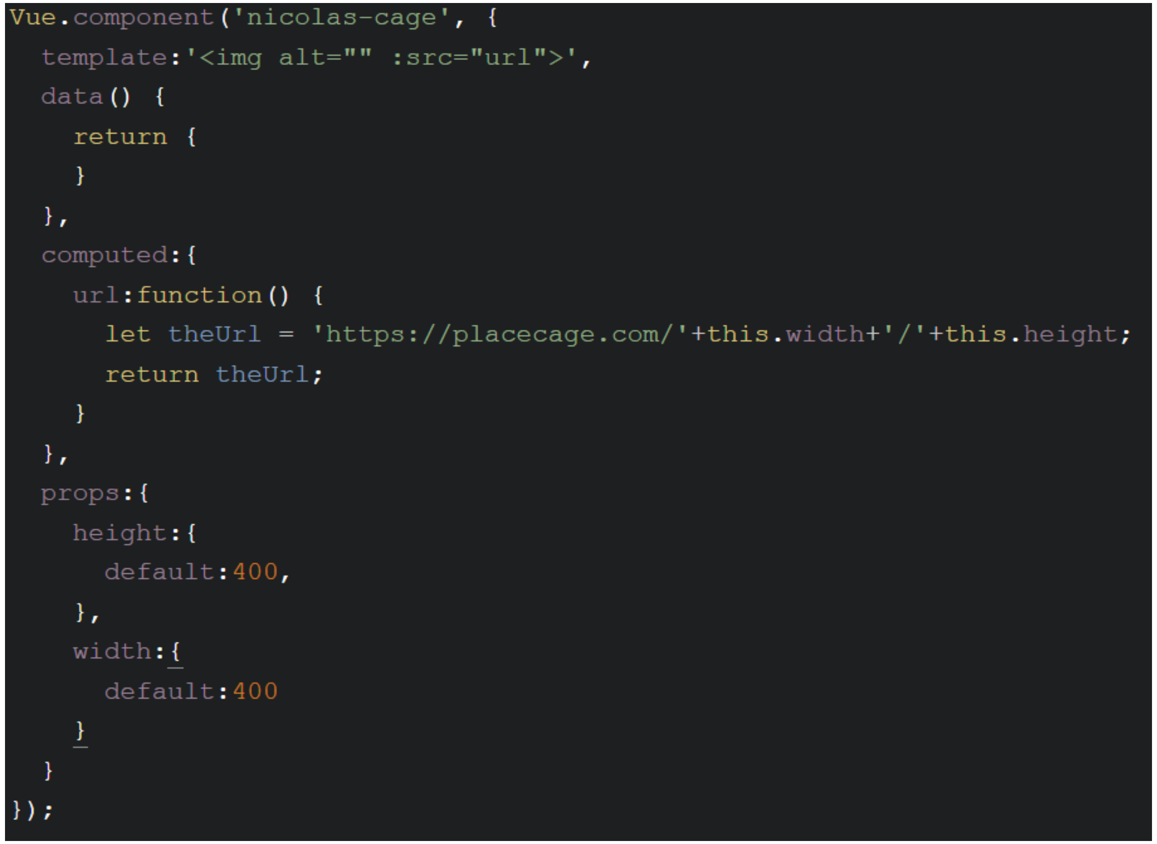
Contain “regular” Vue properties: data, computed, methods

Contains a template (the HTML rendered)

Possibly contains props (defining name, required, type, etc)

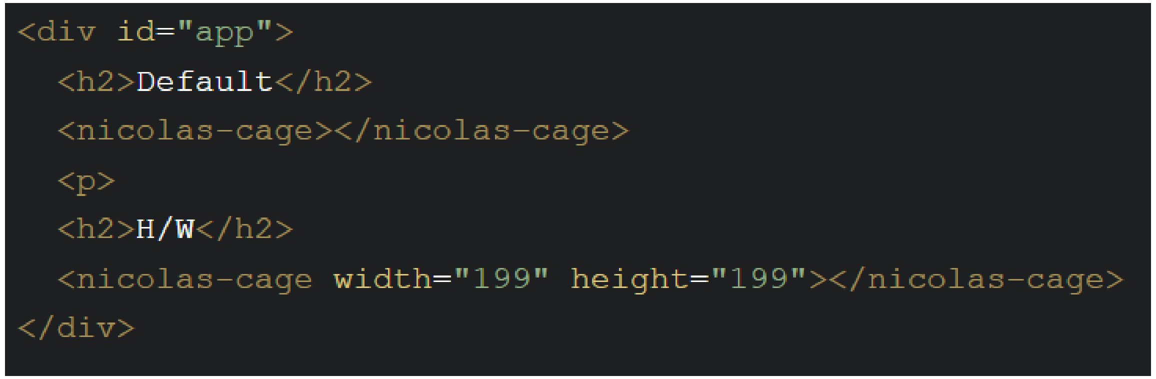
Can be registered globally or just to one Vue app/component

EXAMPLE



```
Vue.component('nicolas-cage', {
  template:'<img alt="" :src="url">',
  data() {
    return {
    }
  },
  computed:{
    url:function() {
      let theUrl = 'https://placecage.com/'+this.width+'/'+this.height;
      return theUrl;
    }
  },
  props:{
    height:{
      default:400,
    },
    width:{
      default:400
    }
  }
});
```

EXAMPLE



```
<div id="app">
  <h2>Default</h2>
  <nicolas-cage></nicolas-cage>
  <p>
  <h2>H/W</h2>
  <nicolas-cage width="199" height="199"></nicolas-cage>
</div>
```

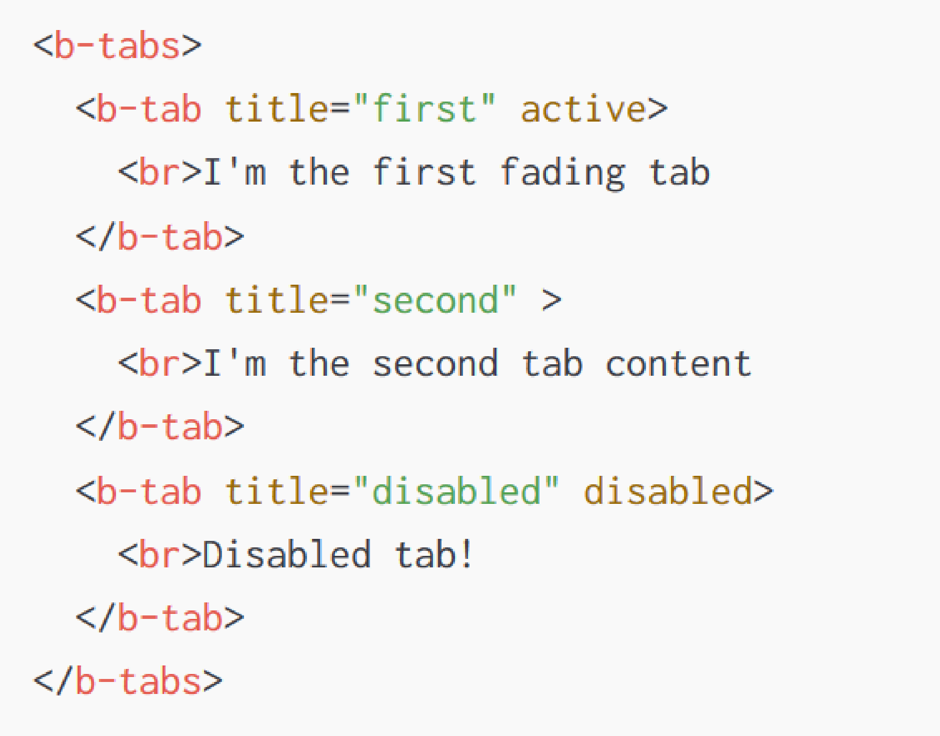
CODE PEN: NICOLAS-CAGE

COMPONENT EXAMPLES

Google Static Maps: https://www.npmjs.com/package/vue-static-map

Bootstrap: https://bootstrap-vue.js.org/

Vuetify: https://vuetifyjs.com/en/



```
<b-tabs>
  <b-tab title="first" active>
    <br>I'm the first fading tab
  </b-tab>
  <b-tab title="second" >
    <br>I'm the second tab content
  </b-tab>
  <b-tab title="disabled" disabled>
    <br>Disabled tab!
  </b-tab>
</b-tabs>
```

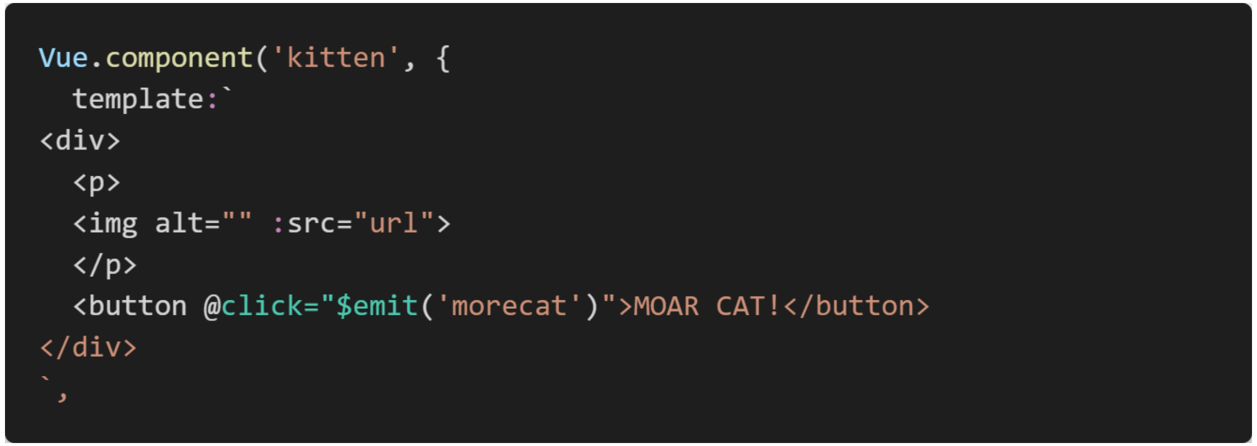
MORE COMPONENT STUFF

Data must be a function

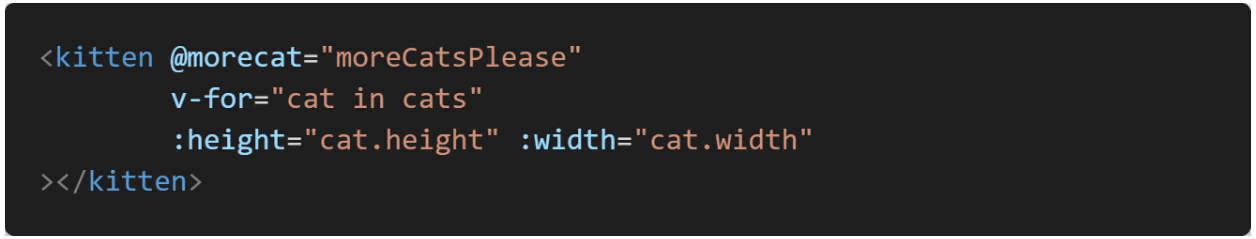
You can pass data in from the parent

You can listen for events from the component ($emit)

EXAMPLE



```
Vue.component('kitten', {
  template:`
<div>
  <p>
  <img alt="" :src="url">
  </p>
  <button @click="$emit('morecat')">MOAR CAT!</button>
</div>
`,
```



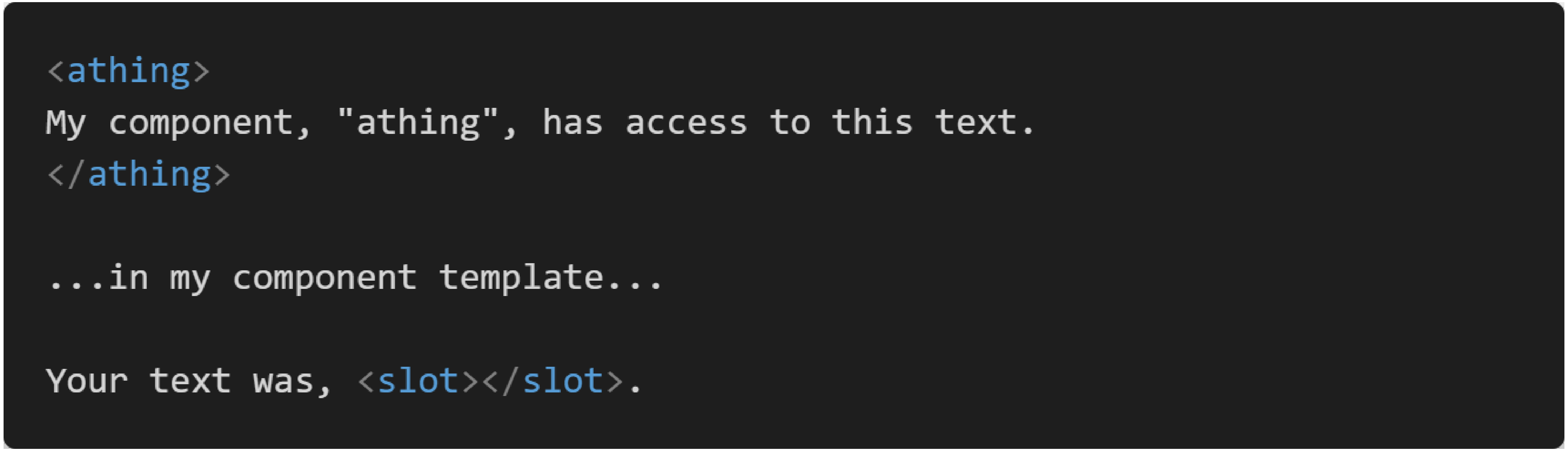
```
<kitten @morecat="moreCatsPlease"
        v-for="cat in cats"
        :height="cat.height" :width="cat.width"
></kitten>
```

CODE PEN: COMPONENT WITH EMIT

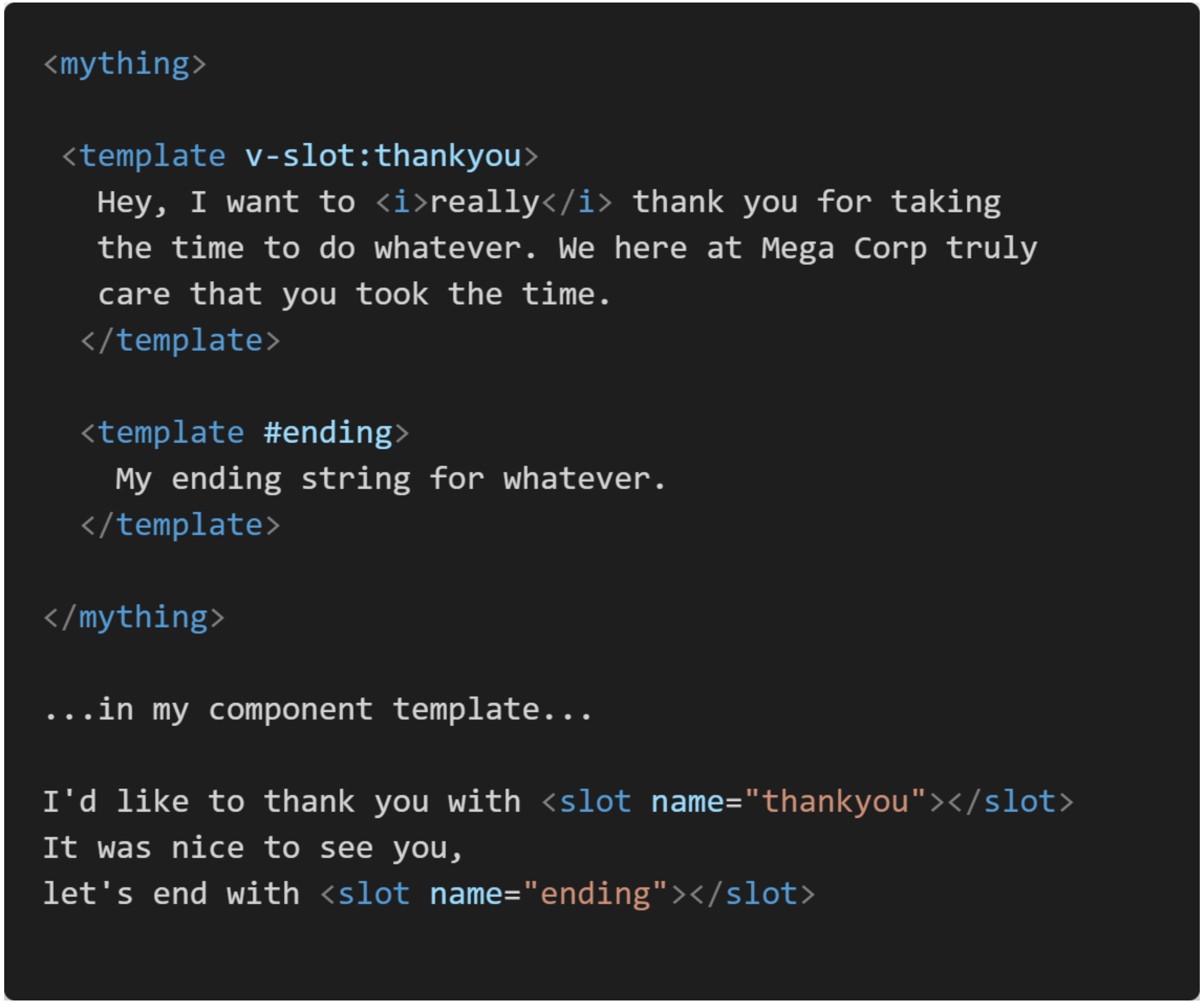
MORE COMPONENT STUFF

Slots lets you pass information to components in a more free form manner.

In ways, the same as props, but you have more freedom.



```
<athing>
My component, "athing", has access to this text.
</athing>

...in my component template...

Your text was, <slot></slot>.
```



```
<mything>

 <template v-slot:thankyou>
   Hey, I want to <i>really</i> thank you for taking
   the time to do whatever. We here at Mega Corp truly
   care that you took the time.
  </template>

  <template #ending>
    My ending string for whatever.
  </template>

</mything>

...in my component template...

I'd like to thank you with <slot name="thankyou"></slot>
It was nice to see you,
let's end with <slot name="ending"></slot>
```

CODE PEN: COMPONENT WITH SLOT

FULL EXAMPLE: PLACEHOLDER

Create an <image-placeholder> tag

Use placeholder.com (or any other service)

Accept height and width (with defaults)

BREAK

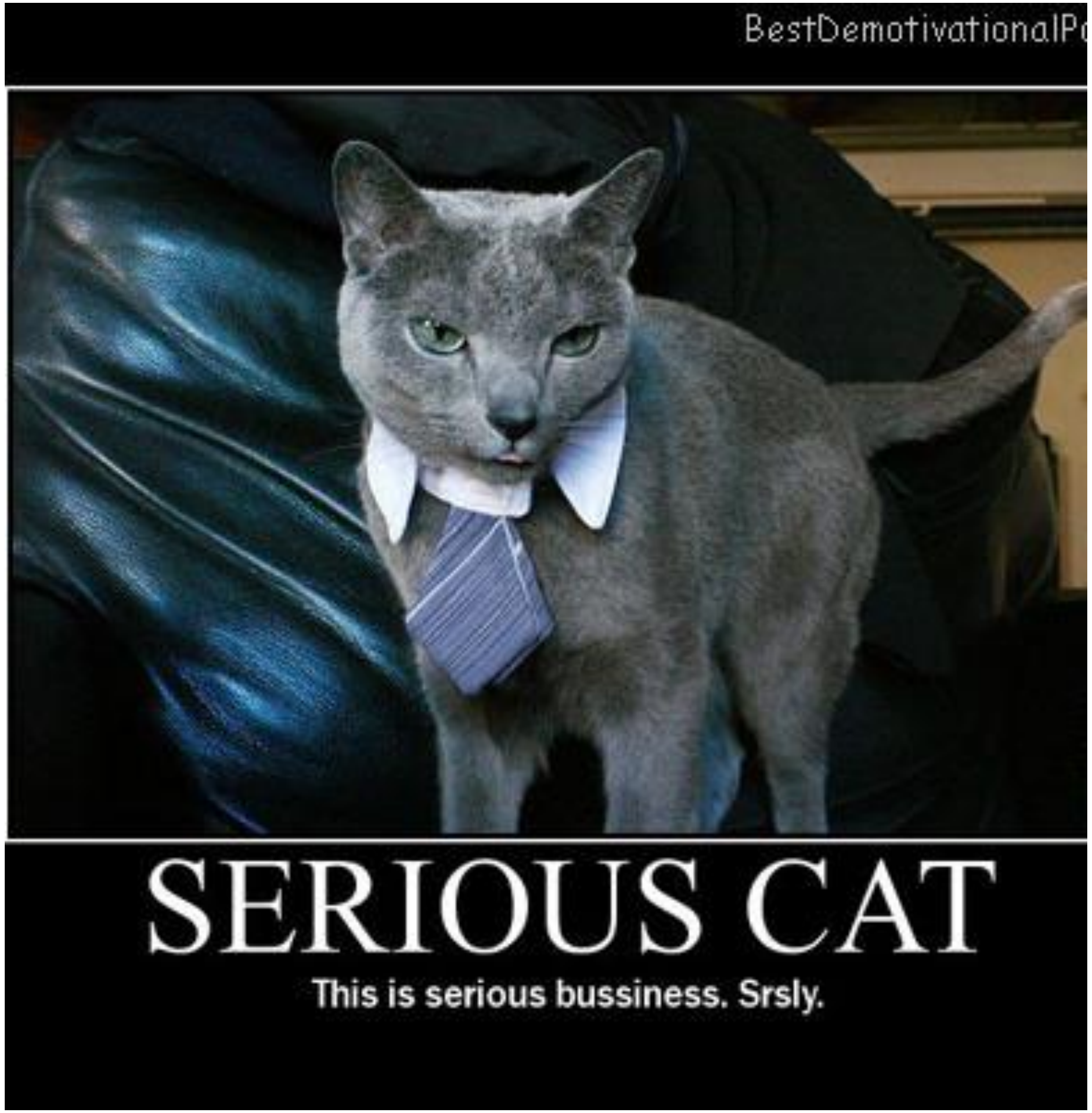
PAGE ENHANCEMENT VERSUS APPS

Warning: Opinions Incoming...

What do we mean by "app"?

When do you use which?

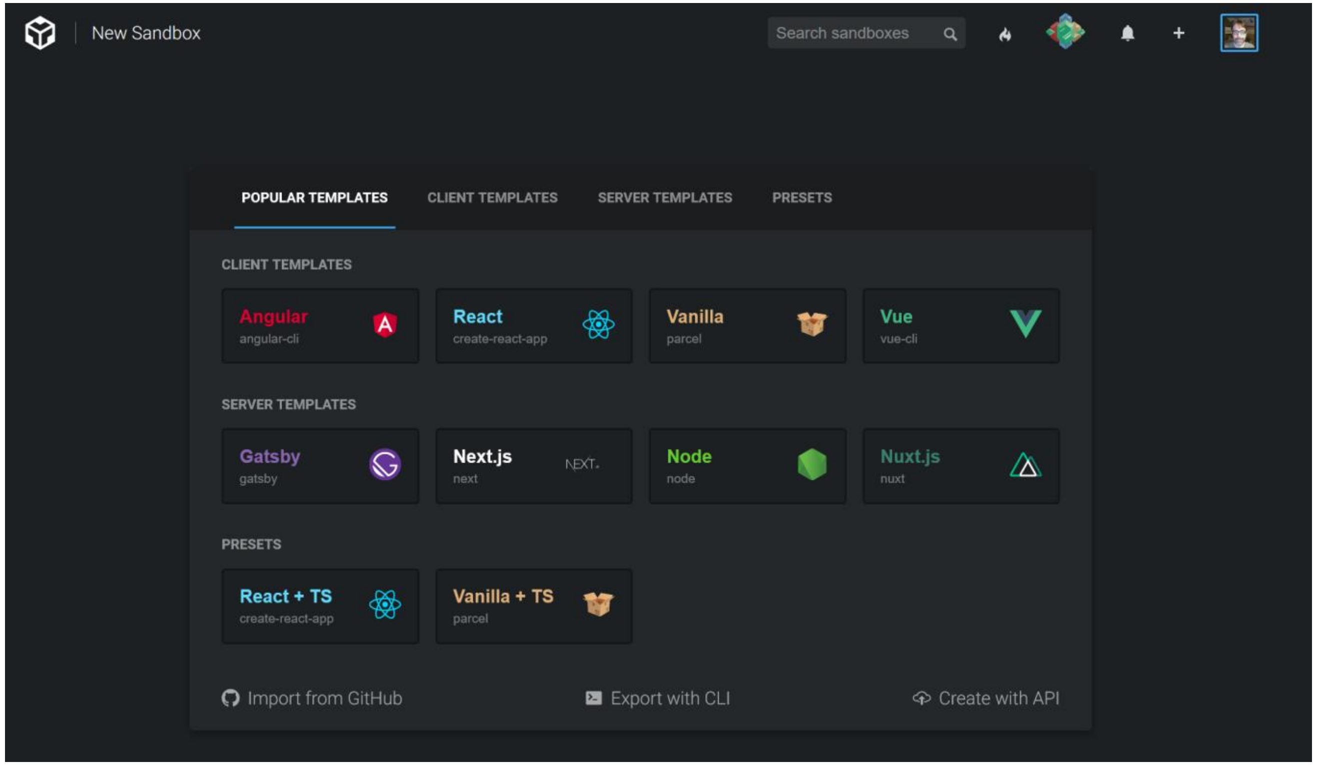
APP TIME!


BestDemotivationalPo
SERIOUS CAT
This is serious bussiness. Srsly.

HOW?

Command Line tool

An online tool (CodeSandbox.io)



THE CLI

Scaffolding and Building tool

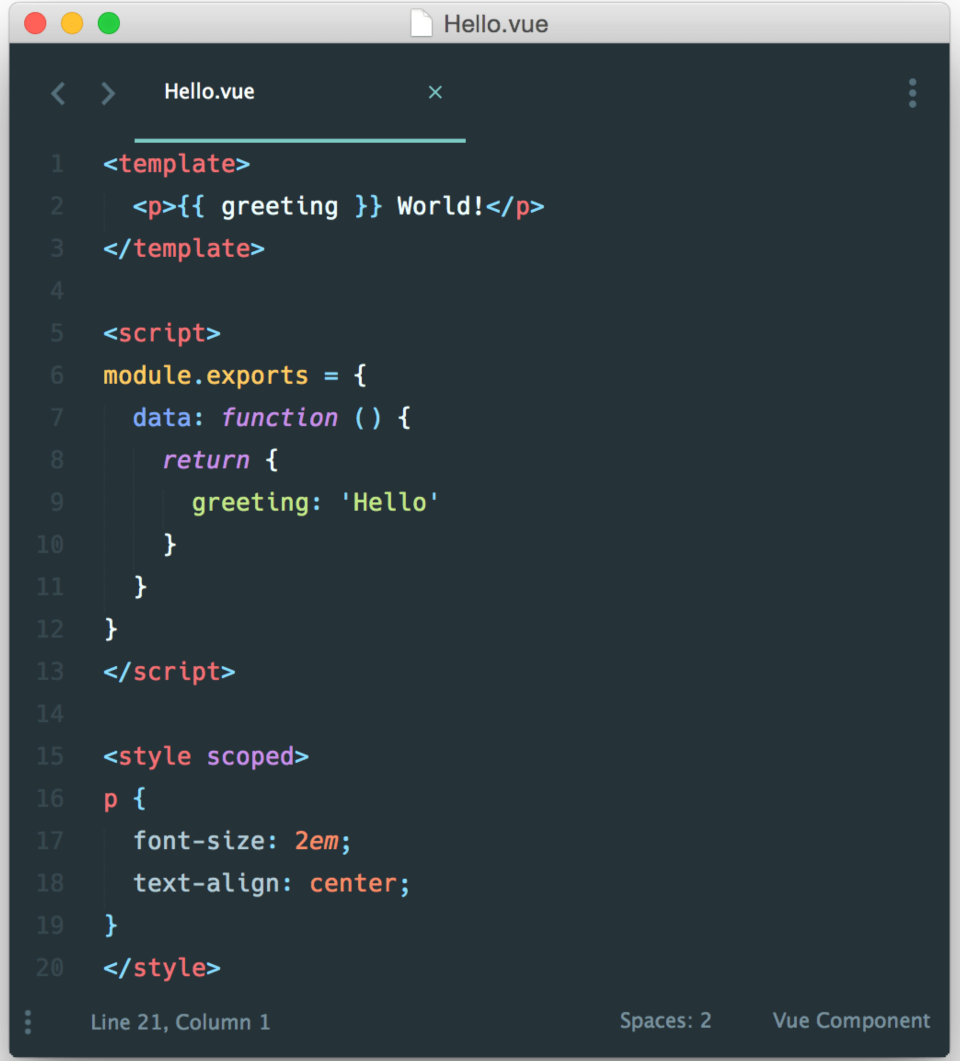
Focused on SPAs (but also does prototyping well)

https://cli.vuejs.org

GUI Tool

Supports Single File Components

SINGLE FILE COMPONENTS



```
<template>
  <p>{{ greeting }} World!</p>
</template>

<script>
module.exports = {
  data: function () {
    return {
      greeting: 'Hello'
    }
  }
}
</script>

<style scoped>
p {
  font-size: 2em;
  text-align: center;
}
</style>
```

WALKTHROUGH

FYI, install via: npm i -g @vue/cli

- npm i -g @vue/cli-service-global

Then: vue create foo

Then: npm run serve

Then: npm run build

Then: Prototype example (note, no hot reload)

Then: UI example

NOW WHAT?

Organization becomes a bit simpler

Optimized output

Easier to Build Up

ROUTING

Not a part of Vue

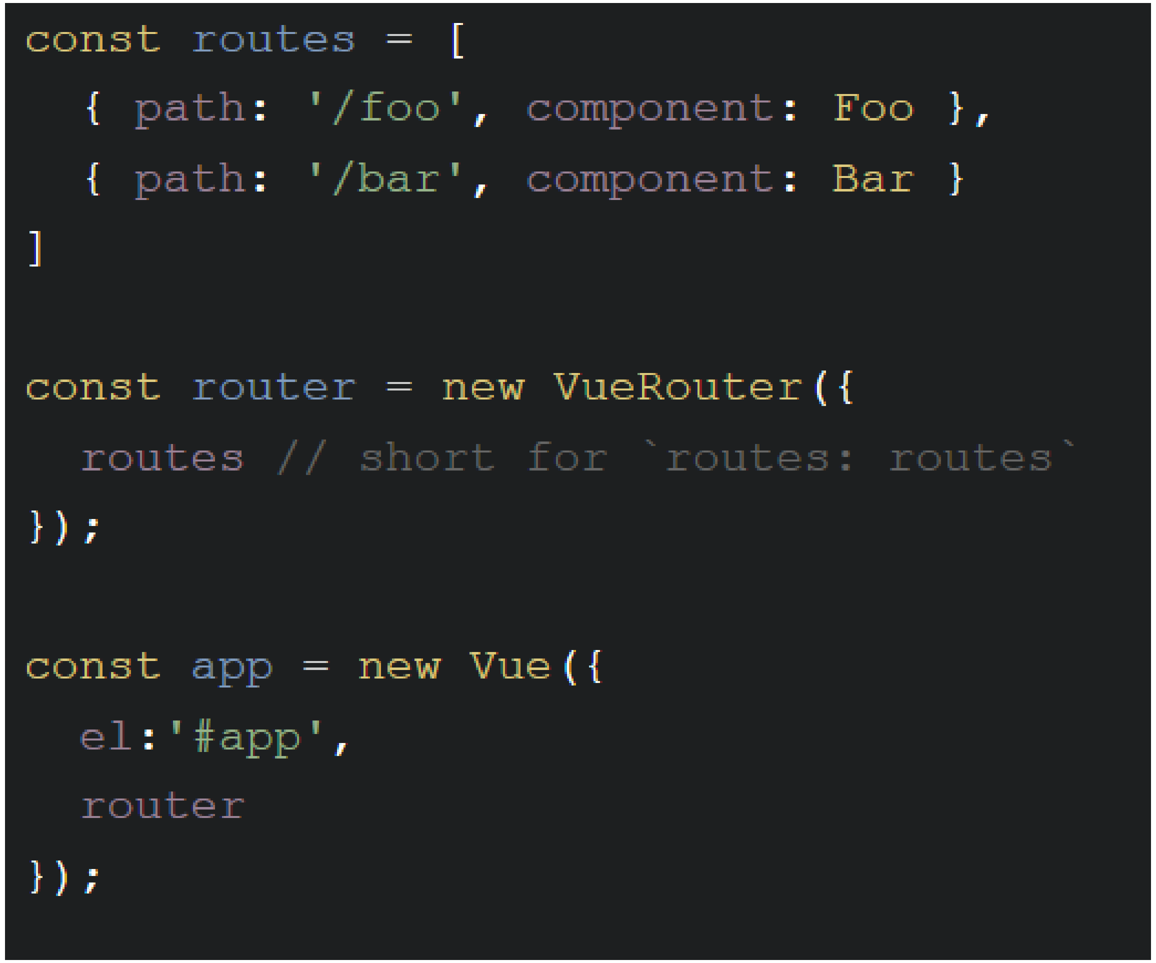
Official library: vue-router (https://router.vuejs.org)

"If I'm at location /foo, I want to do Foo"

"If I'm at location /goo, I want to do Goo"

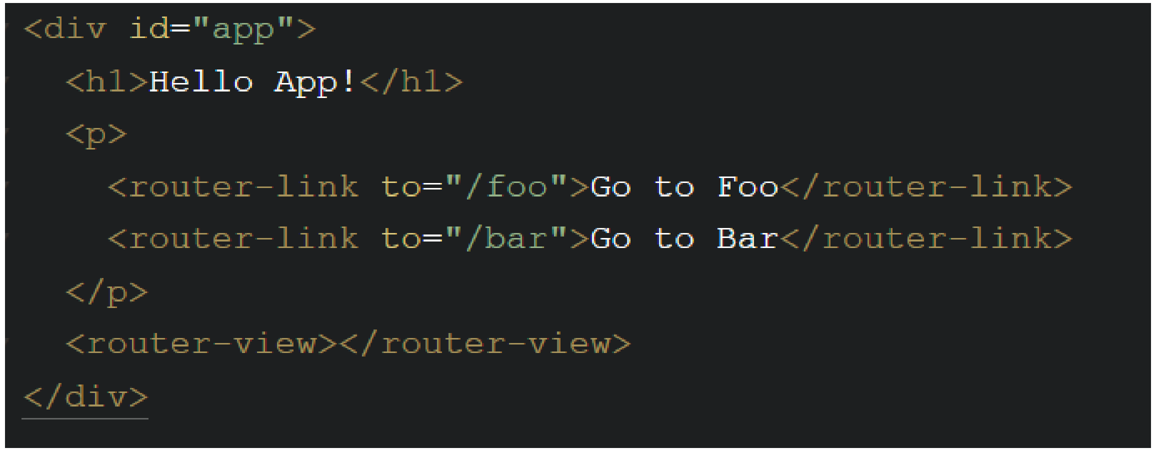
Installation via <script> tag or npm

EXAMPLE (FROM THE DOCS)



```
const routes = [
  { path: '/foo', component: Foo },
  { path: '/bar', component: Bar }
]

const router = new VueRouter({
  routes // short for `routes: routes`
});

const app = new Vue({
  el:'#app',
  router
});
```

EXAMPLE (STILL FROM THE DOCS)



```
<div id="app">
  <h1>Hello App!</h1>
  <p>
    <router-link to="/foo">Go to Foo</router-link>
    <router-link to="/bar">Go to Bar</router-link>
  </p>
  <router-view></router-view>
</div>
```

CODE PEN: EXAMPLE OF ROUTING IN VUE

FULL EXAMPLE: HOME AND ABOUT

First page – a home page

Second page – an about page

Use <router-link> and <router-view>

Use the CLI

PARAMS AND DYNAMIC ROUTES

Routes can be dynamic

/user/:id

Dynamic portion available via $route.params.X

/user/:id/post/:post_id (stolen from docs)

MORE ROUTING FEATURES

404/Catch All:

- path: ‘*’
- path: ‘feature-*’

Programmatic Navigation

- router.push(‘something’)
- router.replace(‘something’)
- router.go(X)

HTML5 History mode

And more…

FULL EXAMPLE: MAIN/DETAIL

First page - list of data (based on an API, but can be anything)

Second page - detail

STATE MANAGEMENT

Solves a problem you may not have!

One component, one set of data = easy

Two components, two set of data = mostly easy

Many components, one set of data = um….

VUEX

(Another) library for Vue (deeply integrated)

https://vuex.vuejs.org/

"Store"

Components can read from the store

Components cannot change data in the store (directly)

PARTS OF VUEX

State

Mutations

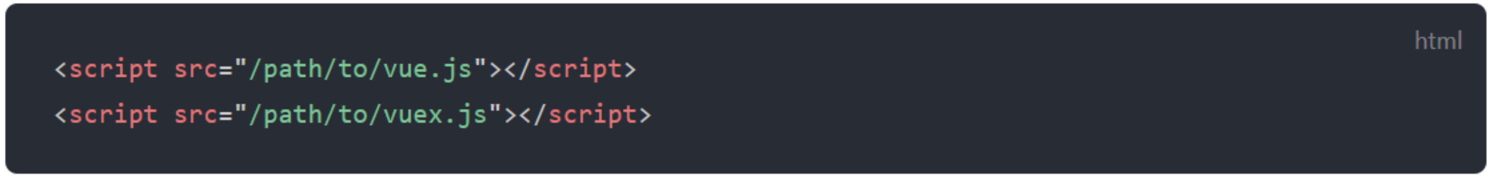
Getters

Actions

Modules

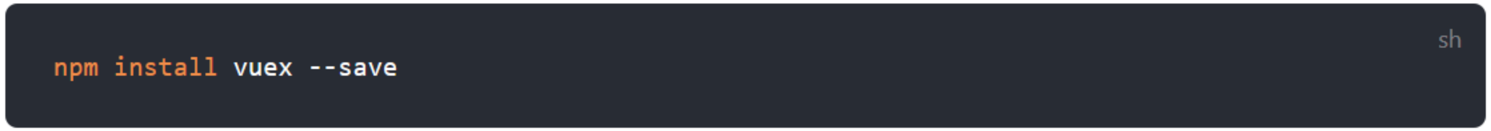
INCLUDING VUEX

Examples taken from docs….

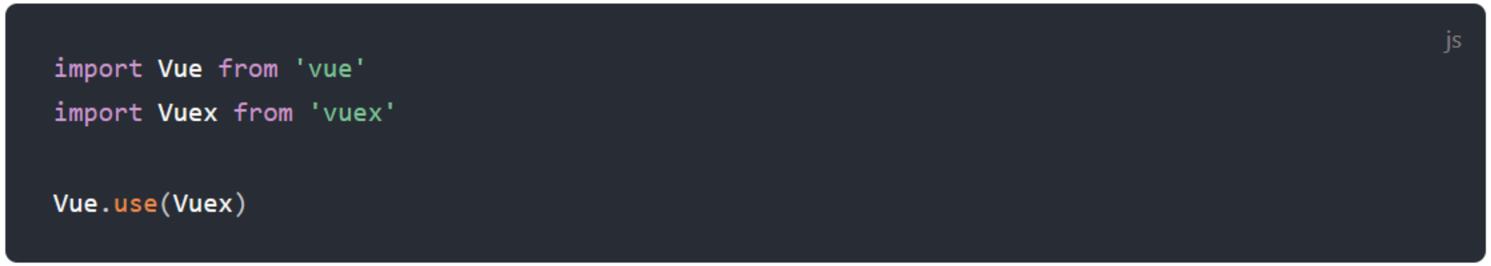


```html
<script src="/path/to/vue.js"></script>
<script src="/path/to/vuex.js"></script>
```

Or…

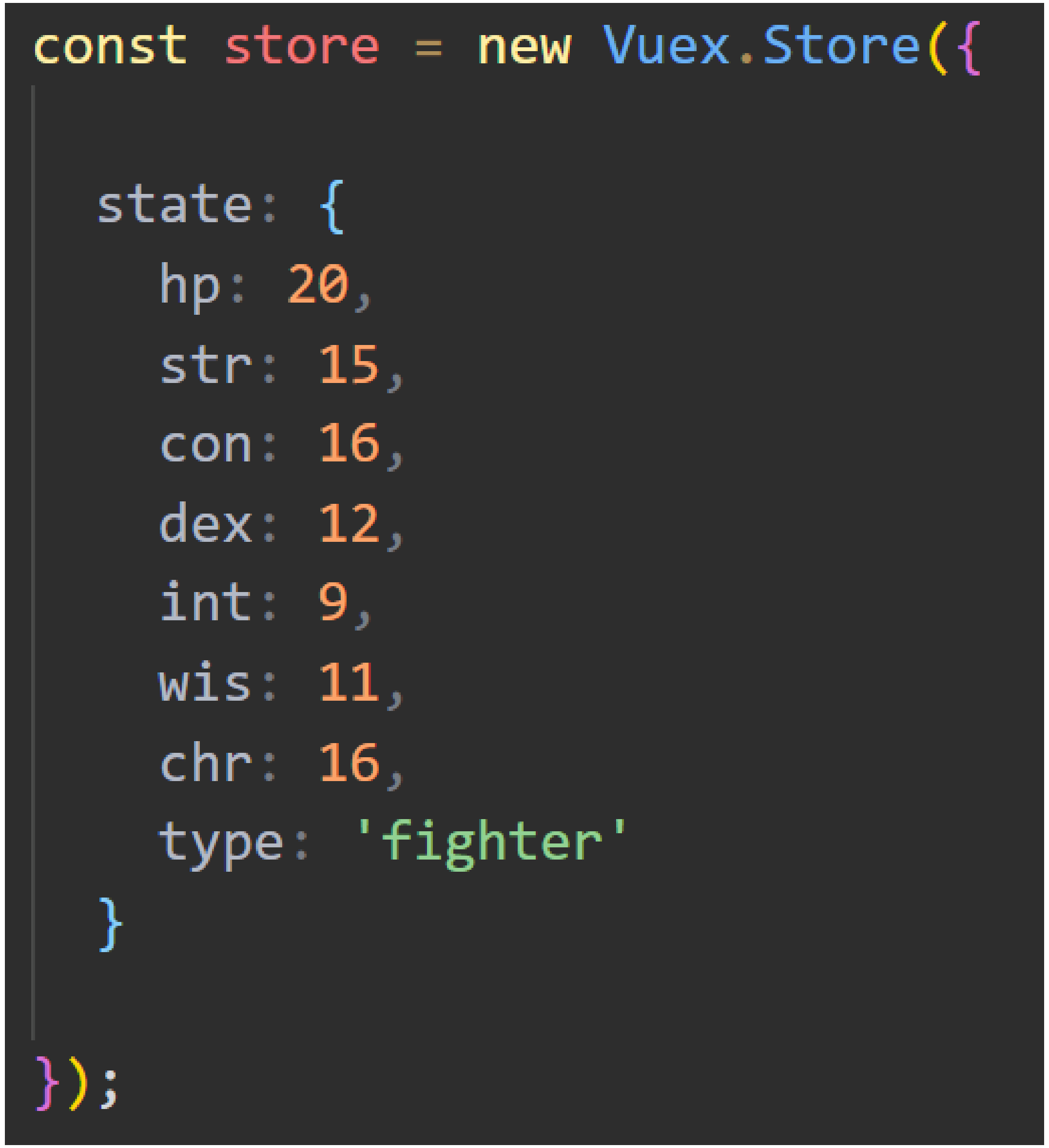


```sh
npm install vuex --save
```



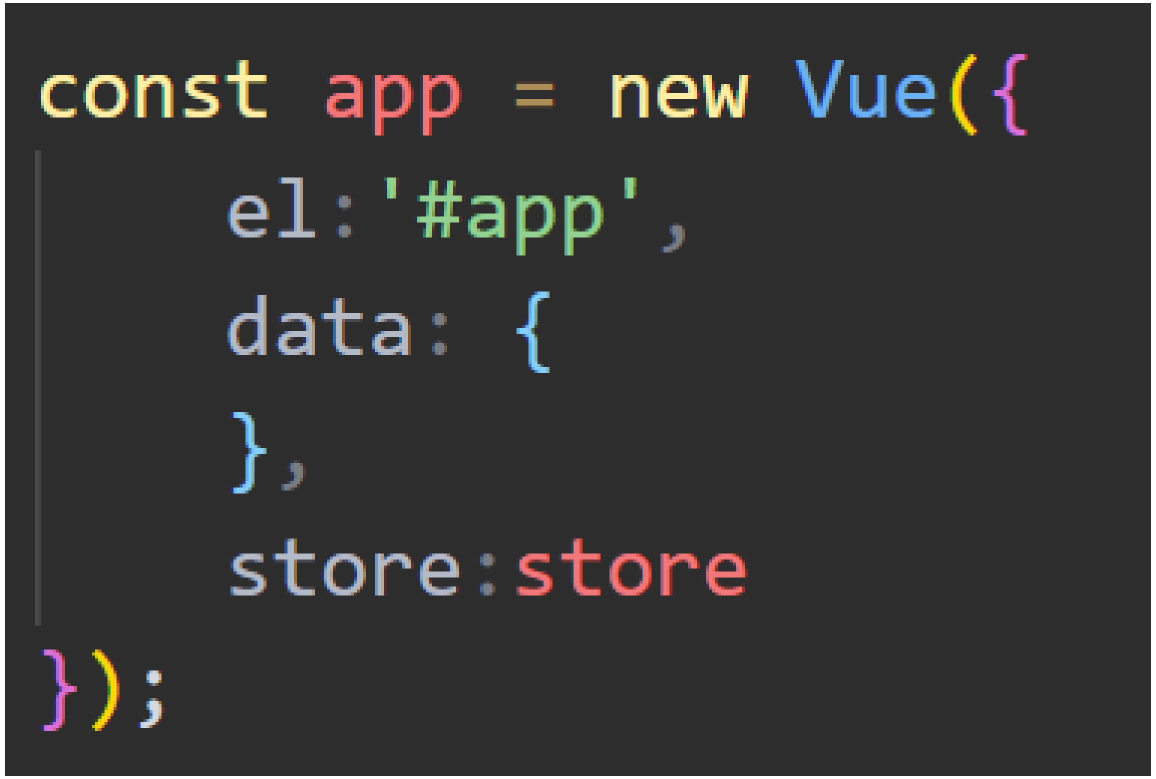
```js
import Vue from 'vue'
import Vuex from 'vuex'

Vue.use(Vuex)
```

CREATING A VUEX STORE



```
const store = new Vuex.Store({

  state: {
    hp: 20,
    str: 15,
    con: 16,
    dex: 12,
    int: 9,
    wis: 11,
    chr: 16,
    type: 'fighter'
  }

});
```

ADDING THE STORE



```
const app = new Vue({
    el:'#app',
    data: {
    },
    store:store
});
```

MUTATIONS

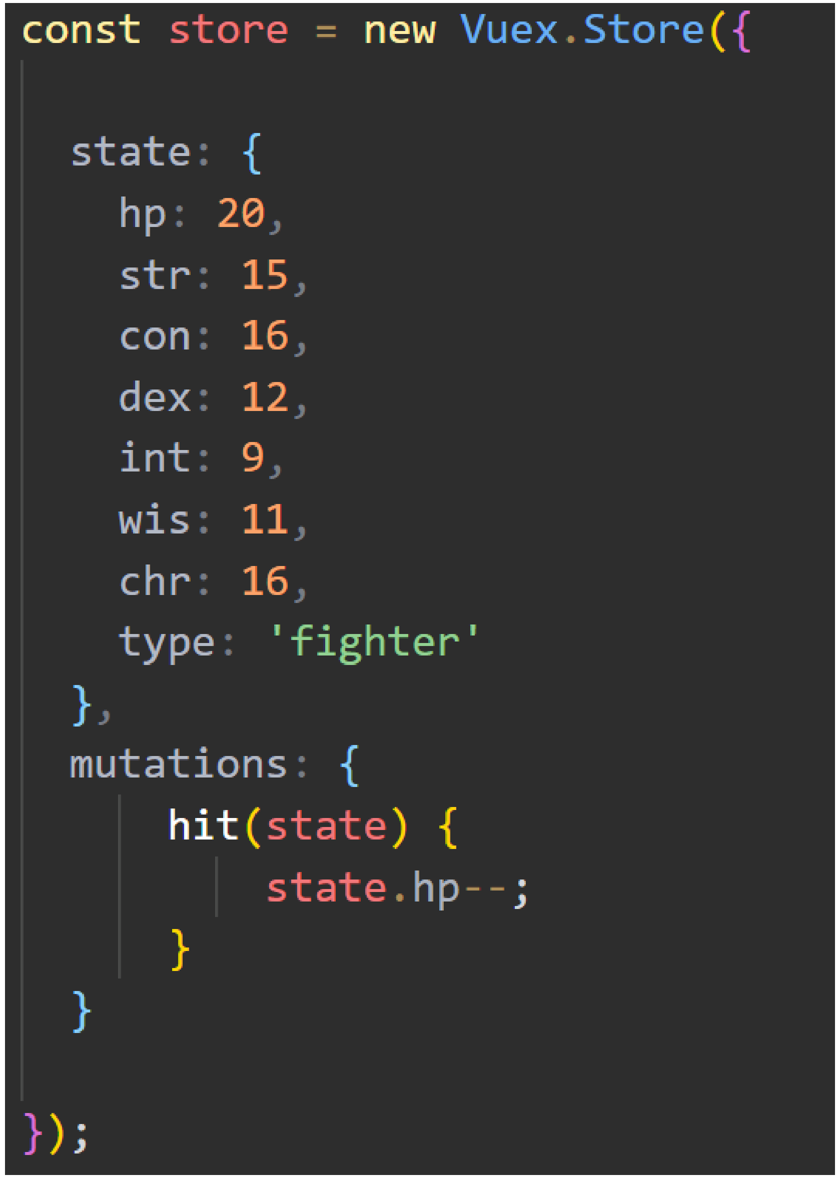
Change state

Called externally via: store.commit('name of mutation');

Or: store.commit('name of mutation', someAdditionalValue);

EXAMPLE MUTATION

To call: store.commit('hit');



```
const store = new Vuex.Store({

  state: {
    hp: 20,
    str: 15,
    con: 16,
    dex: 12,
    int: 9,
    wis: 11,
    chr: 16,
    type: 'fighter'
  },
  mutations: {
    hit(state) {
      state.hp--;
    }
  }

});
```

CODE PEN: VUEX DEMO 1

ACTIONS

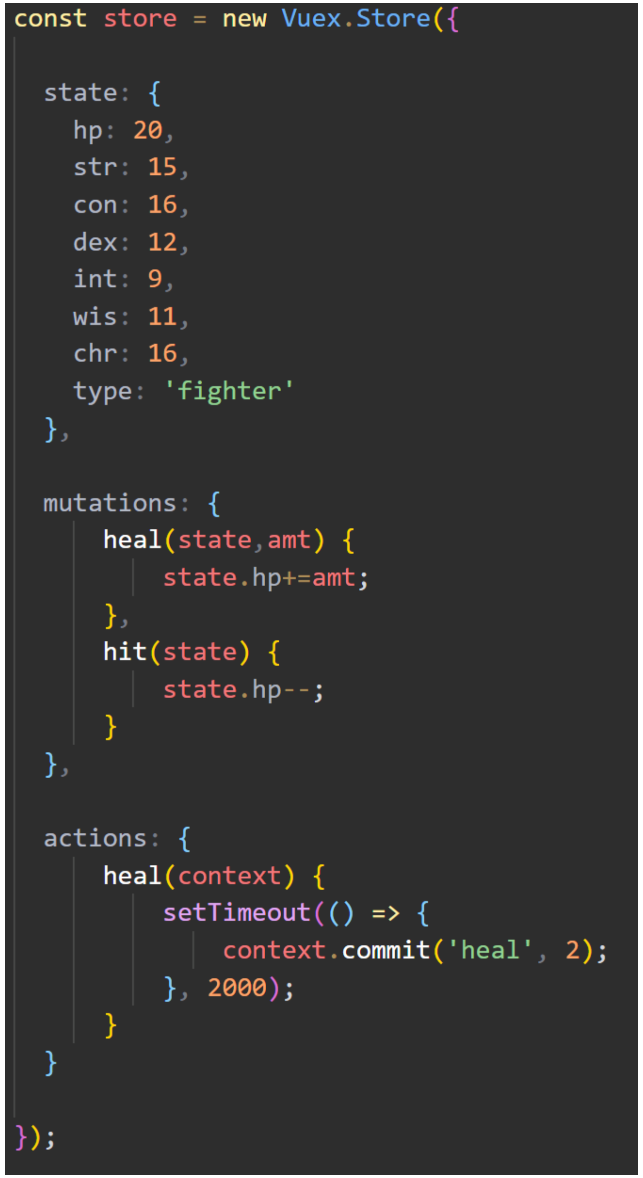
Async

Chain to mutations

Called externally via store.dispatch('name of action', optional additional data);

If the distinction seems a bit weird… yes.

EXAMPLE ACTION



```
const store = new Vuex.Store({

  state: {
    hp: 20,
    str: 15,
    con: 16,
    dex: 12,
    int: 9,
    wis: 11,
    chr: 16,
    type: 'fighter'
  },

  mutations: {
    heal(state,amt) {
      state.hp+=amt;
    },
    hit(state) {
      state.hp--;
    }
  },

  actions: {
    heal(context) {
      setTimeout(() => {
        context.commit('heal', 2);
      }, 2000);
    }
  }

});
```

CODE PEN: VUEX DEMO 2

GETTERS

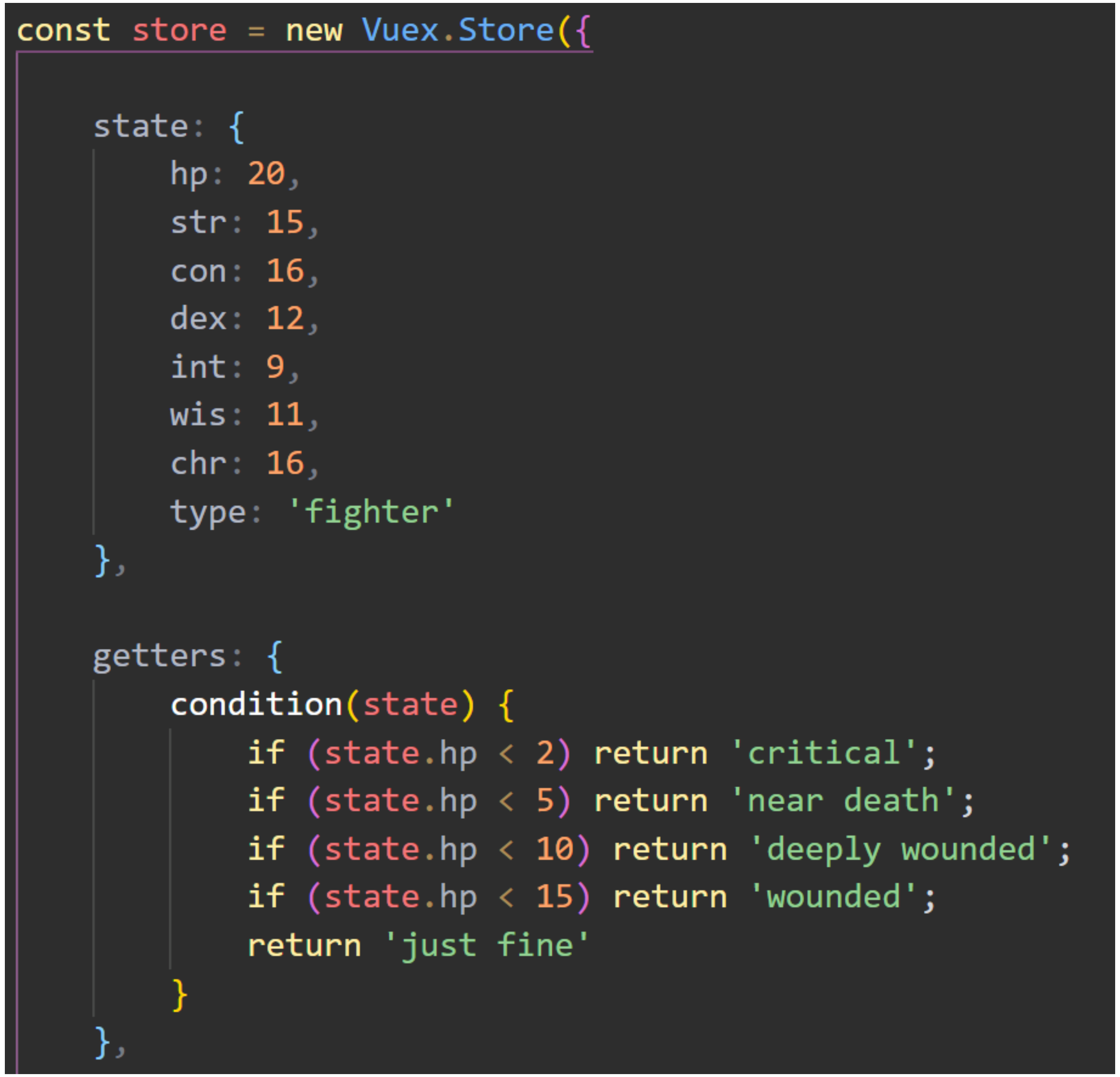
Pretty much just computed for Vuex

Values are cached based on dependencies

Accessed externally via store.getters.nameOfGetter

Can return a function so you can do: store.getters.nameOfGetter(arg).

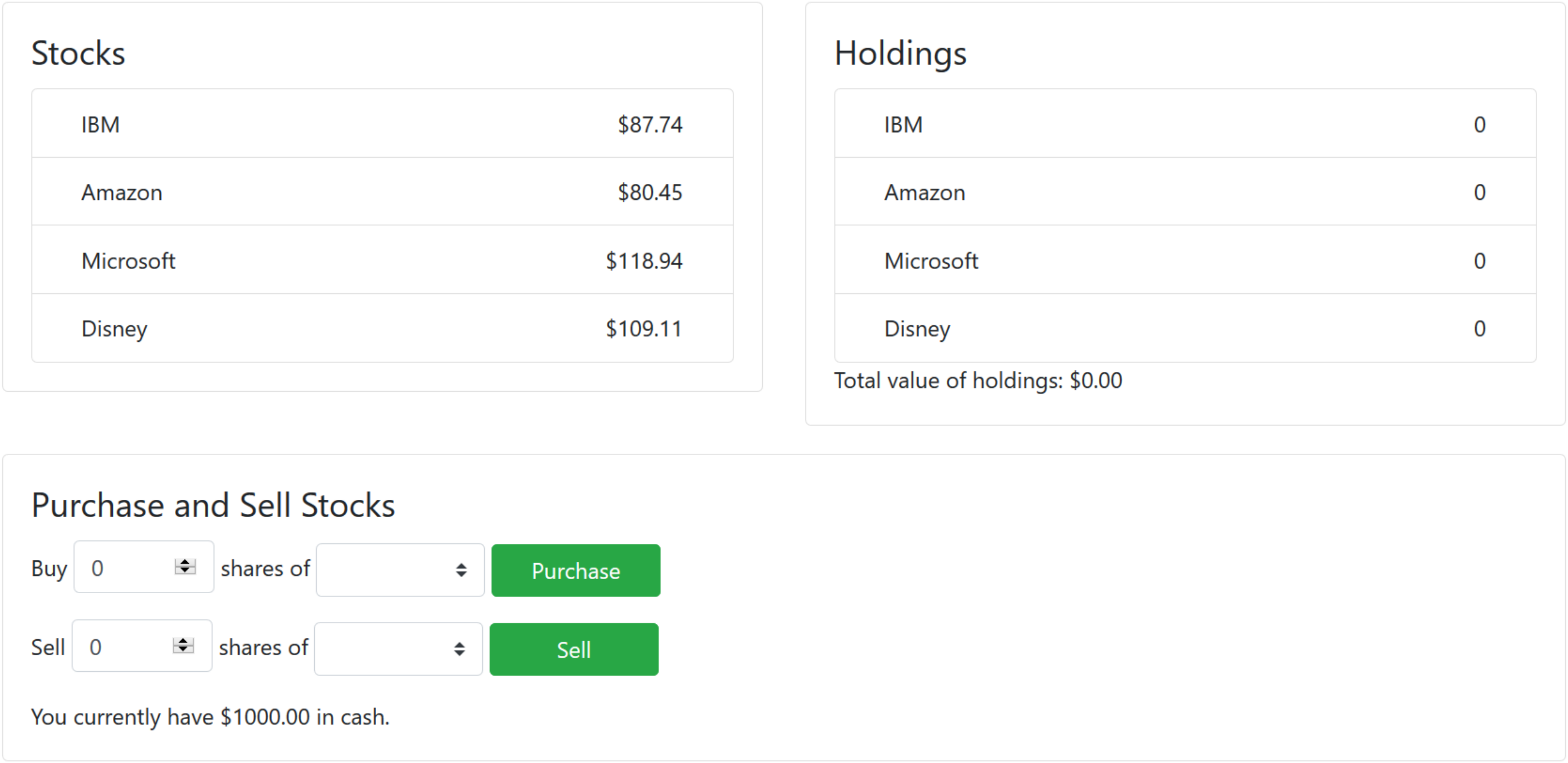
EXAMPLE GETTER



```
const store = new Vuex.Store({

    state: {
        hp: 20,
        str: 15,
        con: 16,
        dex: 12,
        int: 9,
        wis: 11,
        chr: 16,
        type: 'fighter'
    },

    getters: {
        condition(state) {
            if (state.hp < 2) return 'critical';
            if (state.hp < 5) return 'near death';
            if (state.hp < 10) return 'deeply wounded';
            if (state.hp < 15) return 'wounded';
            return 'just fine'
        }
    },
```

CODE PEN: VUEX DEMO 3

ONE MORE VUEX DEMO



Stocks

IBM	$87.74
Amazon	$80.45
Microsoft	$118.94
Disney	$109.11

Holdings

IBM	0
Amazon	0
Microsoft	0
Disney	0

Total value of holdings: $0.00

Purchase and Sell Stocks

Buy 0 shares of

Sell 0 shares of

You currently have $1000.00 in cash.

CODE PEN: STOCK GAME

3.0 - WHAT'S NEXT?

VUE 3.0

Faster, smaller

- Virtual DOM rewrite, native Proxy, 100% faster component instance initialization
- 20kb to roughly half (gzipped)

Multiple v-model support

- <MyThing v-model:rank="userRank" v-model:title="userTitle" />

Suspense

- Fallback support (ie, show this while loading)

Portals

- Render content elsewhere, uses a <Teleport> tag

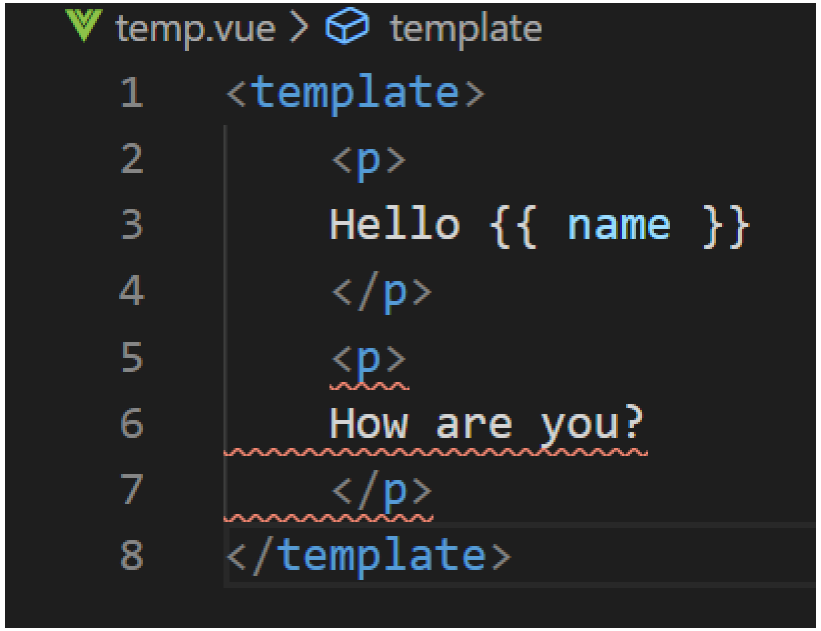
VUE 3.0

TypeScript Support

- Vue itself - all in TS

No need for "wrapper" divs in template blocks (aka "Fragments")

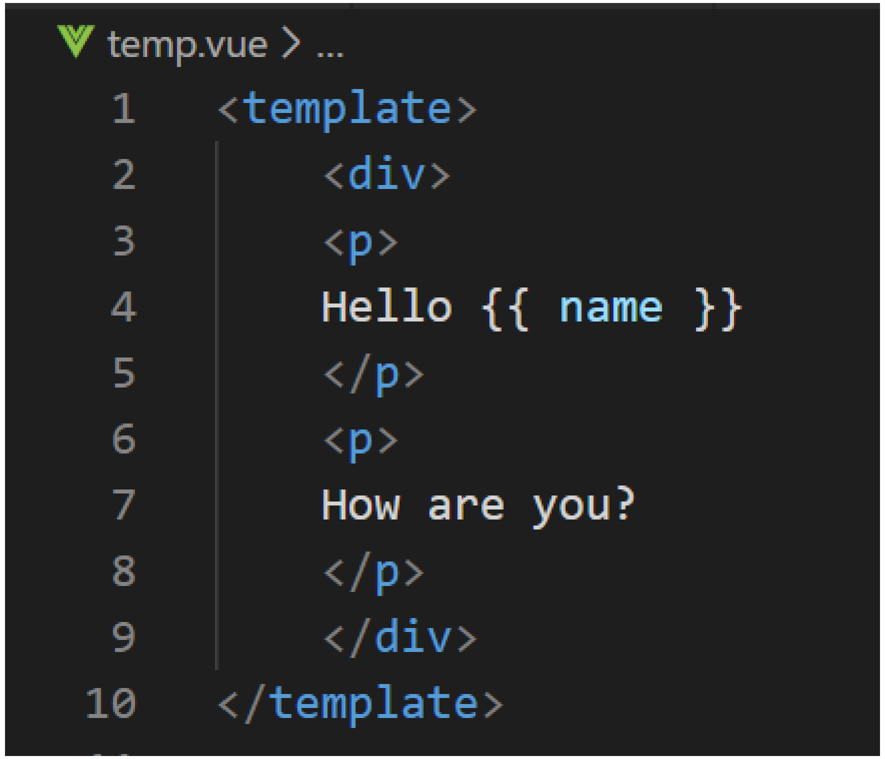
VUE 3.0



temp.vue > template

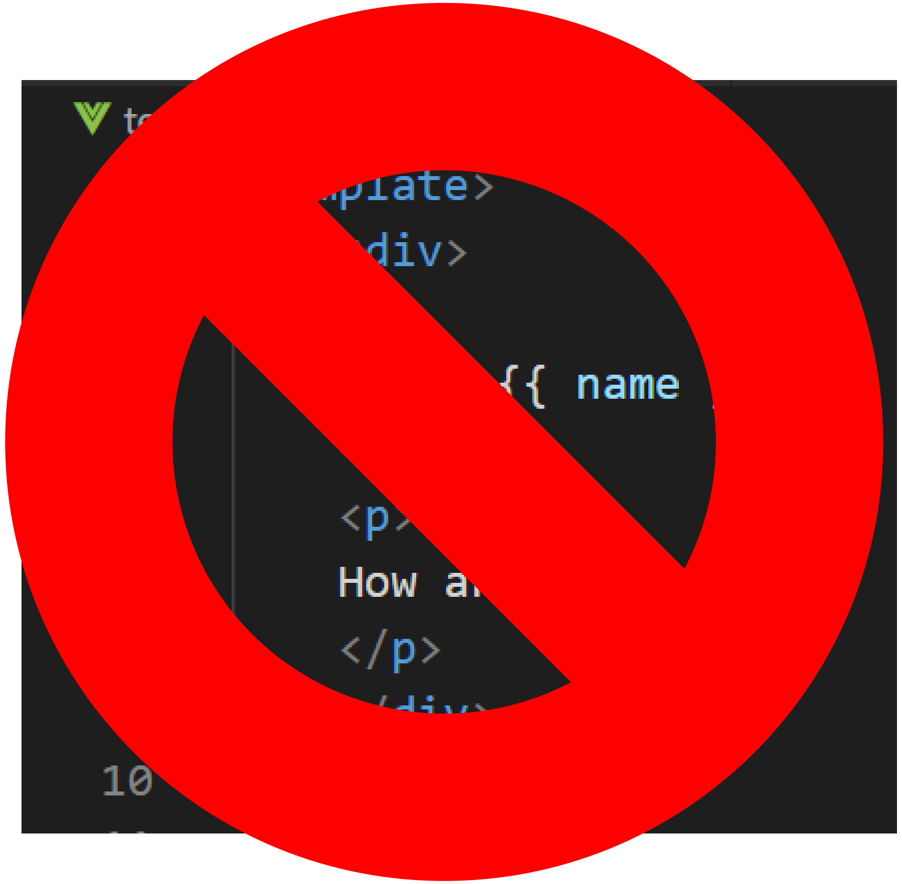
```
<template>
    <p>
    Hello {{ name }}
    </p>
    <p>
    How are you?
    </p>
</template>
```

VUE 3.0



```
<template>
    <div>
    <p>
    Hello {{ name }}
    </p>
    <p>
    How are you?
    </p>
    </div>
</template>
```

VUE 3.0



```
te
mplate>
div>

        {{ name

  <p>
  How a
  </p>
  </div>
```

VUE 3.0

TypeScript Support

- Vue itself - all in TS

No need for "wrapper" divs in template blocks (aka "Fragments")

Mounting changes to global libraries (add stuff to your Vue app, not global Vue object)

Composition API

- OPTIONAL new way of writing components
- Better for larger, complex architectures

Official repo: https://github.com/vuejs/vue-next

VUE 3 - RIP

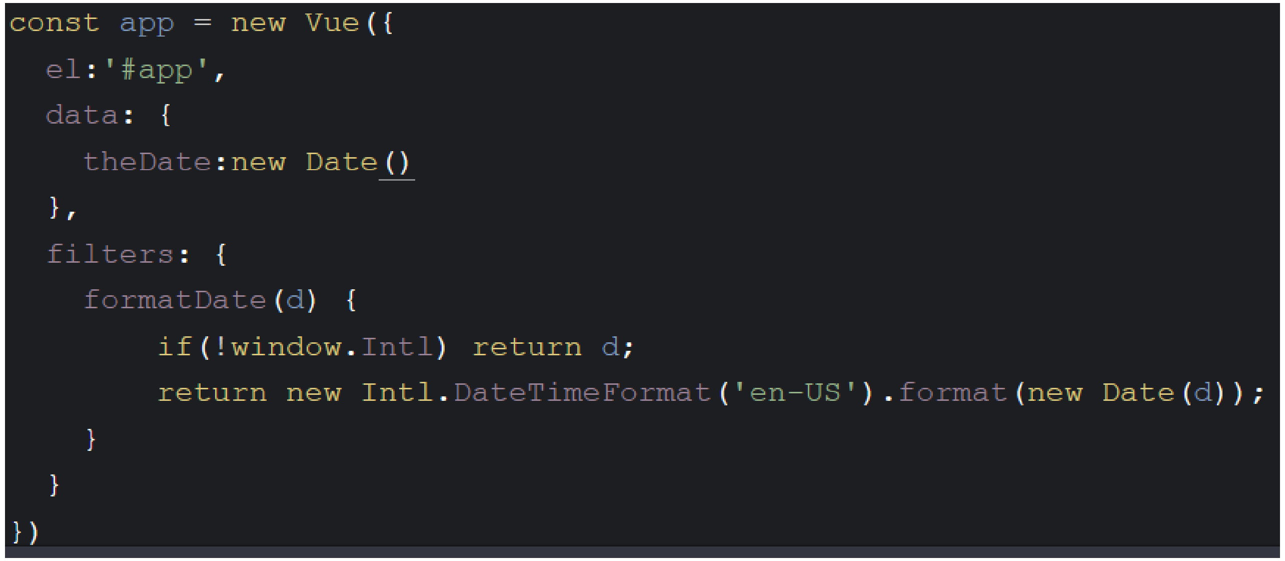
Filters (deprecated)

render function (changed)

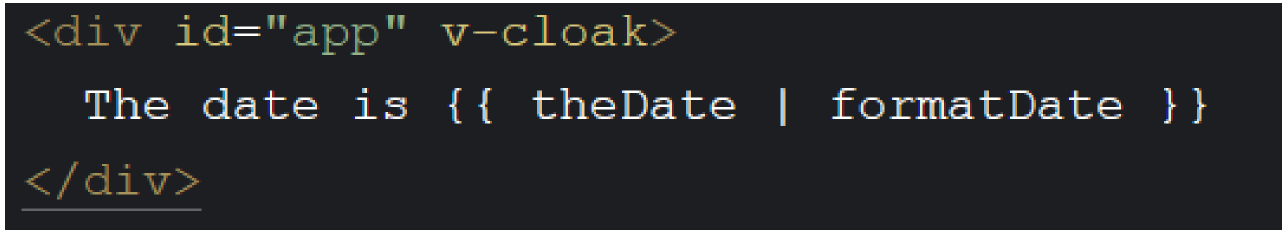
Event Bus (deprecated)

Photo by Charles Deluvio on Unsplash

FILTERS



```
const app = new Vue({
  el:'#app',
  data: {
    theDate:new Date()
  },
  filters: {
    formatDate(d) {
        if(!window.Intl) return d;
        return new Intl.DateTimeFormat('en-US').format(new Date(d));
    }
  }
})
```



```
<div id="app" v-cloak>
   The date is {{ theDate | formatDate }}
</div>
```

VUE 3.0 - LEARN MORE

Dan Vega on Vue 3 - https://www.youtube.com/watch?v=HmdKqXP8JR8

Upgrade guide - https://dev.to/blacksonic/the-vue-3-upgrade-guide-4dc4

Roundup - https://madewithvuejs.com/blog/vue-3-roundup

BUT WAIT — THERE’S MORE!

EVEN MOAR!!!

Devtools Extension (Chrome, Firefox, Electron, Apple Keynote Browser)

- https://github.com/vuejs/vue-devtools

Sarah Drasner on CSS-Tricks: https://css-tricks.com/intro-to-vue-1-rendering-directives-events/

Vue docs has a cool cookbook: https://vuejs.org/v2/cookbook/

Newsletters:

- https://news.vuejs.org
- https://vuejsdevelopers.com/newsletter/

My Stuff: https://www.raymondcamden.com/tags/vuejs

STUFF I DIDN'T COVER

Unit Testing (https://vuejs.org/v2/guide/unit-testing.html)

Transitions (https://vuejs.org/v2/guide/transitions.html)

Custom Directives (https://vuejs.org/v2/guide/custom-directive.html)

More….

ANY QUESTIONS?