Ridiculously Reusable Components

Workshop Repos:

https://github.com/ridiculously-reusable-components

Workshop Resources

Kanban Board app

INTRODUCTIONS

A little about us…

Damian Dulisz

Lead Frontend Engineer @ Coursedog

Vue.js Core Team

GitHub: @shentao

Twitter: @damiandulisz

A little bit about you…

Get to know your neighbors

1. Name
2. Skills
3. Fun Fact

Before we get started...

PARTICIPATION TIPS

Raise your hand for **questions** at **any** time!

There are no wrong questions here.

PARTICIPATION TIPS

All slides and examples are **public**.

No need to hurry and copy notes before we switch slides.

PARTICIPATION TIPS

Please **no recording**.

Out of respect for you and your participants' privacy

PARTICIPATION TIPS

These are **guidelines**. Not rules.

Feel free to question and/or disagree.

Your opinion and experience matter too.

Choose what works best for you and your team.

Questions?

What will we cover?

What will we cover?

1. Techniques for building and managing components
2. Tips from our experience
3. Best practices for designing components
4. Useful design patterns

There’s going to be
a lot of information…

There’s going to be a lot of information…

but we encourage you to stay engaged and take notes on what parts interest you.

The Progressive JavaScript Framework

WHY VUE.JS? GET STARTED GITHUB

Approachable

Already know HTML, CSS and JavaScript? Read the guide and start building things in no time!

Versatile

An incrementally adoptable ecosystem that scales between a library and a full-featured framework.

Performant

20KB min+gzip Runtime
Blazing Fast Virtual DOM
Minimal Optimization Efforts

The Progressive JavaScript Framework

WHY VUE.JS? GET STARTED GITHUB

Approachable

Already know HTML, CSS and JavaScript? Read the guide and start building things in no time!

Versatile

An incrementally adoptable ecosystem that scales between a library and a full-featured framework.

Performant

20KB min+gzip Runtime
Blazing Fast Virtual DOM
Minimal Optimization Efforts

The Progressive JavaScript Framework

WHY VUE.JS? GET STARTED GITHUB

Approachable

Already know HTML, CSS and JavaScript? Read the guide and start building things in no time!

Versatile

An incrementally adoptable ecosystem that scales between a library and a full-featured framework.

Performant

20KB min+gzip Runtime
Blazing Fast Virtual DOM
Minimal Optimization Efforts

The Progressive JavaScript Framework

WHY VUE.JS? GET STARTED GITHUB

Approachable

Already know HTML, CSS and JavaScript? Read the guide and start building things in no time!

Versatile

An incrementally adoptable ecosystem that scales between a library and a full-featured framework.

Performant

20KB min+gzip Runtime
Blazing Fast Virtual DOM
Minimal Optimization Efforts

Component Basics

Navbar.vue

```
<template>
  <ul>
    <li class="nav-item">
      <a href="/Home">Home</a>
    </li>
    <li class="nav-item">
      <a href="/About">About</a>
    </li>
    <li class="nav-item">
      <a href="/Contact">Contact</a>
    </li>
  </ul>
</template>
```

Navbar.vue

```vue
<template>
  <ul>
    <li class="nav-item">
      <a href="/Home">Home</a>
    </li>
    <li class="nav-item">
      <a href="/About">About</a>
    </li>
    <li class="nav-item">
      <a href="/Contact">Contact</a>
    </li>
  </ul>
</template>
```

NavItem.vue

```vue
<template>
  <li class="nav-item">
    <a :href="`/${label}`">
      {{ label }}
    </a>
  </li>
</template>
```

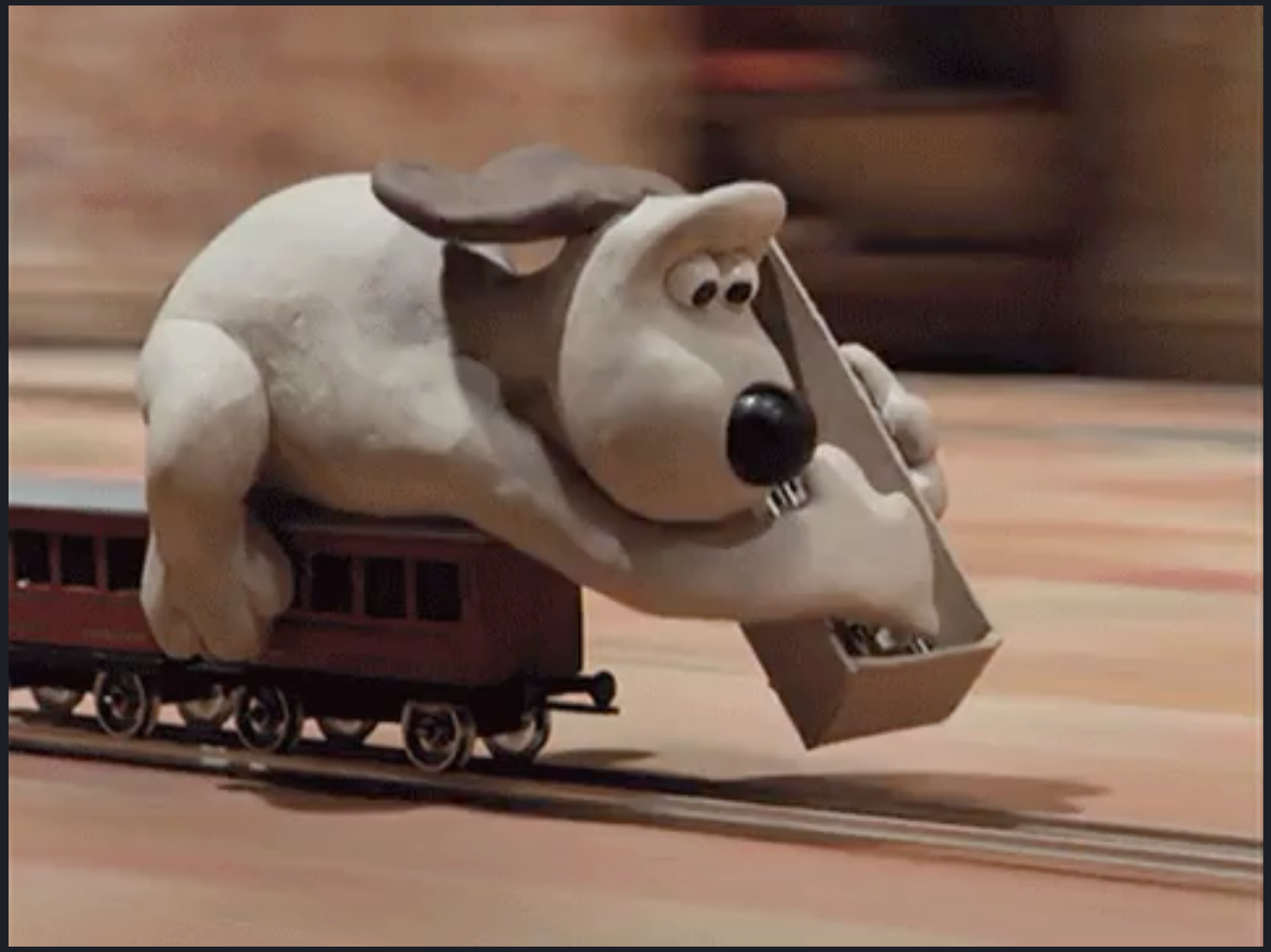
Navbar.vue

```
<template>
  <ul>
    <li class="nav-item">
      <a href="/Home">Home</a>
    </li>
    <li class="nav-item">
      <a href="/About">About</a>
    </li>
    <li class="nav-item">
      <a href="/Contact">Contact</a>
    </li>
  </ul>
</template>
```

Navbar.vue

```
<template>
  <ul>
    <NavItem label="Home"></NavItem>
    <NavItem label="About"></NavItem>
    <NavItem label="Contact"></NavItem>
  </ul>
</template>
```

Why Components?



Build things faster

No more repetitive code

Less bugs means you can relax

Questions?

TECHNIQUE

Props

NavItem.vue

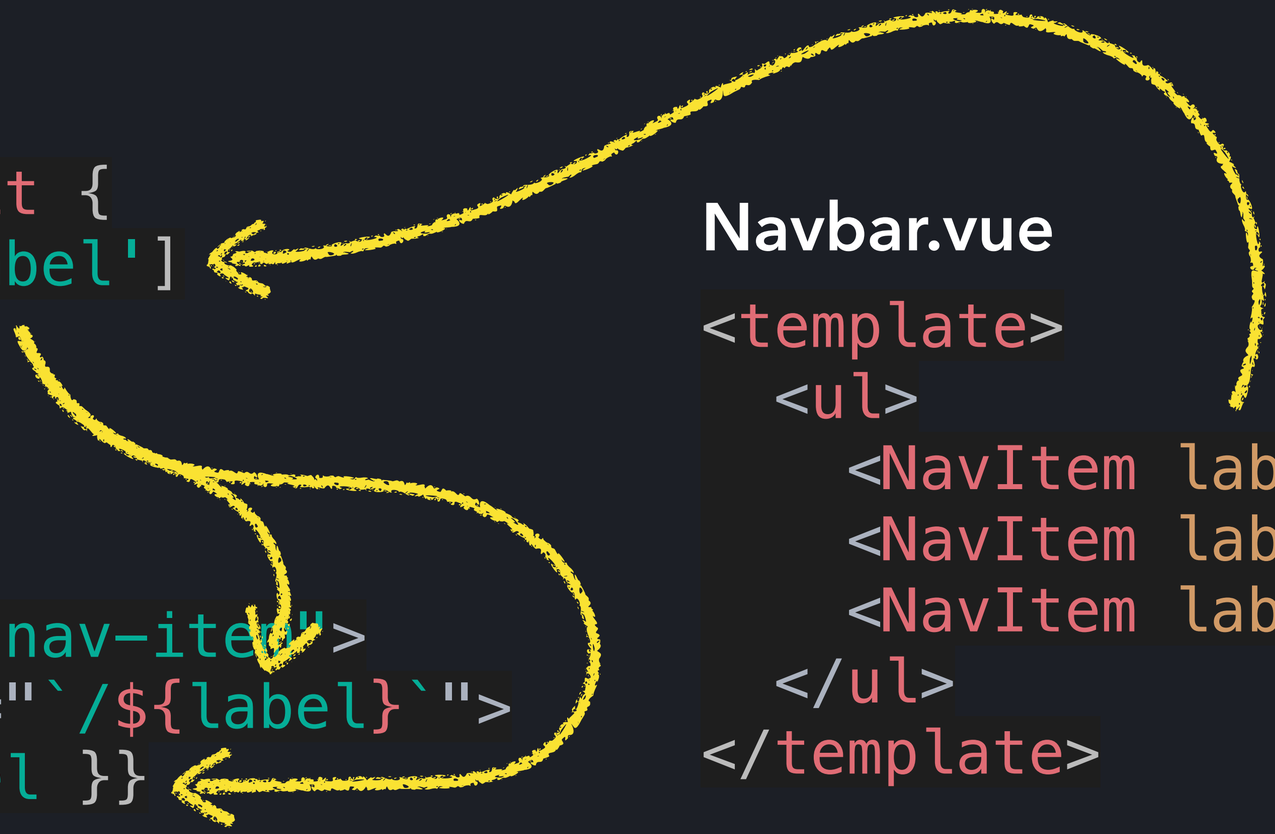
```
<script>
export default {
  props: ['label']
}
</script>

<template>
  <li class="nav-item">
    <a :href="`/${label}`">
      {{ label }}
    </a>
  </li>
</template>
```

NavItem.vue

```
<script>
export default {
  props: ['label']
}
</script>

<template>
  <li class="nav-item">
    <a :href="`/${label}`">
      {{ label }}
    </a>
  </li>
</template>
```

Navbar.vue

```
<template>
  <ul>
    <NavItem label="Home" />
    <NavItem label="About" />
    <NavItem label="Contact" />
  </ul>
</template>
```



NavItem.vue

```
<script>
export default {
  props: ['label']
}
</script>

<template>
  <li class="nav-item">
    <a :href="`/${label}`">
      {{ label }}
    </a>
  </li>
</template>
```

Navbar.vue

```
<template>
  <ul>
    <NavItem label="Home" />
    <NavItem label="About" />
    <NavItem label="Contact" />
  </ul>
</template>
```

NavItem.vue

```
<script>
export default {
  props: {
    label: {
      type: String,
      required: true,
      default: 'Home'
    }
  }
}
</script>
```

NavItem.vue

```
<script>
export default {
  props: {
    label: {
      type: String,
      default: 'Home'
    }
  }
}
</script>
```

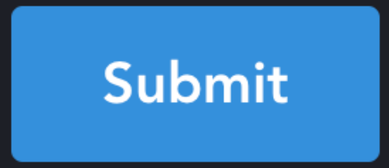
Let’s do a

Let’s do a

Coding Experiment

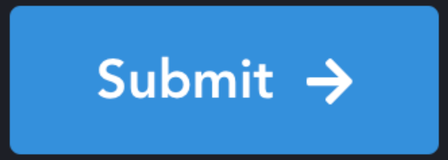
Task 1

Create a button component that can display text specified in the parent component



Task 2

Allow the button to display an icon of choice on the right side of the text

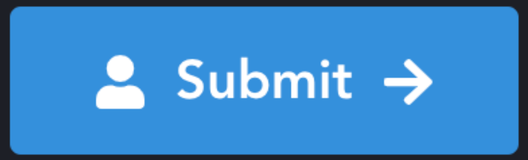



```
<AppIcon icon="arrow-right" class="ml-3"/>
```

This is the code responsible for displaying an arrow.

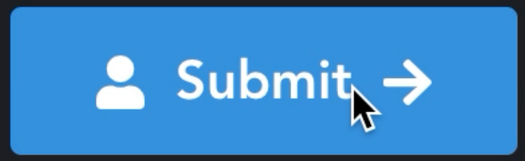
Task 3

Make it possible to have icons on either side or even both sides



Task 4

Make it possible to replace the content with a loading spinner

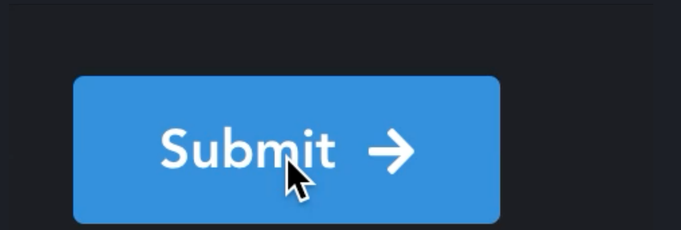



```
<PulseLoader color="#fff" size="12px"/>
```

This is the code responsible for displaying a spinner.

Task 5

Make it possible to replace an icon with a loading spinner



Possible solution

```
<template>
  <button type=“button" class=“nice-button“>
    {{ text }}
  </button>
</template>

<script>
export default {
  props: [‘text']
}
</script>
```

```
<template>
  <button type=“button" class=“nice-button“>
    <PulseLoader v-if="isLoading" color="#fff" size="12px">
    <template v-else>
      <template v-if="iconLeftName">
        <PulseLoader v-if="isLoadingLeft" color="#fff" size="6px">
        <AppIcon v-else :icon=“iconLeftName"/>
      </template>
      {{ text }}
      <template v-if="iconRightName">
        <PulseLoader v-if="isLoadingRight" color="#fff" size="6px">
        <AppIcon v-else :icon=“iconRightName”/>
      </template>
    </template>
  </button>
</template>

<script>
export default {
  props: ['text', 'iconLeftName', 'iconRightName', ‘isLoading’,
'isLoadingLeft', 'isLoadingRight']
}
</script>
```


OMG
PROPS EVERYWHERE!

```
<template>
  <button type=“button" class=“nice-button“>
    <PulseLoader v-if="isLoading" color="#fff" size="12px">
    <template v-else>
      <template v-if="iconLeftName">
        <PulseLoader v-if="isLoadingLeft" color="#fff" size="6px">
        <AppIcon v-else :icon=“iconLeftName"/>
      </template>
      {{ text }}
      <template v-if="iconRightName">
        <PulseLoader v-if="isLoadingRight" color="#fff" size="6px">
        <AppIcon v-else :icon=“iconRightName"/>
      </template>
    </template>
  </button>
</template>

<script>
export default {
  props: ['text', 'iconLeftName', 'iconRightName', ‘isLoading’,
'isLoadingLeft', 'isLoadingRight']
}
</script>
```

Let’s call it the props-based solution

props-based solution

Is it wrong?

props-based solution

Is it wrong?

No.

It does the job.

props-based solution

Is it good, then?

props-based solution

Is it good, then?

Not exactly.

props-based solution

Problems

props-based solution

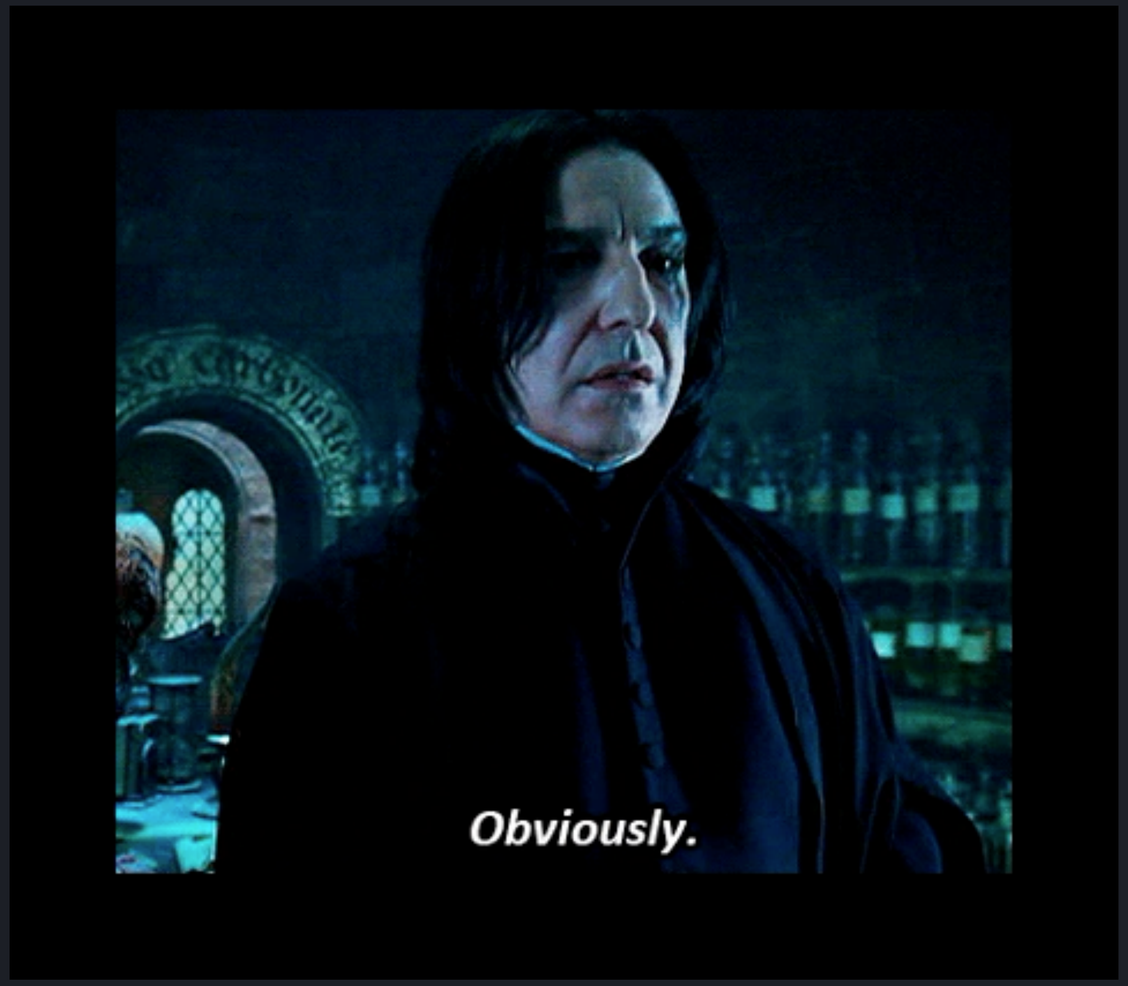
Problems

- New requirements increase complexity
- Multiple responsibilities
- Lots of conditionals in the template
- Low flexibility
- Hard to maintain

Is it good, then?

Not exactly.

Is there a better another alternative?



Is there a better another alternative?

Recommended solution

Recommended solution

```
<template>
  <button type=“button" class=“nice-button“>
    <slot/>
  </button>
</template>
```

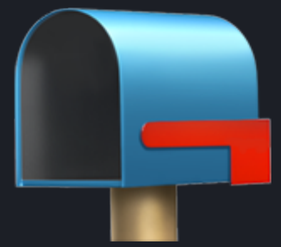
TECHNIQUE

Slots

TECHNIQUE

Slots

A content distribution API inspired by the Web Components spec draft, using the <slot> element to serve as distribution outlets for content.



BaseButton.vue

```
<template>
  <button type=“button" class=“nice-button“>
    <PulseLoader v-if="isLoading" color="#fff" size="12px">
    <template v-else>
      <template v-if="iconLeftName">
        <PulseLoader v-if="isLoadingLeft" color="#fff" size="6px">
        <AppIcon v-else :icon=“iconLeftName"/>
      </template>
      {{ text }}
      <template v-if="iconRightName">
        <PulseLoader v-if="isLoadingRight" color="#fff" size="6px">
        <AppIcon v-else :icon=“iconRightName”/>
      </template>
    </template>
  </button>
</template>

<script>
export default {
  props: ['text', 'iconLeftName', 'iconRightName', ‘isLoading’,
'isLoadingLeft', 'isLoadingRight']
}
</script>
```

BaseButton.vue

```
<template>
  <button type=“button" class=“nice-button“>
    <slot/>
  </button>
</template>
```

BaseButton.vue

```
<template>
  <button type=“button" class=“nice-button“>
    <slot/>
  </button>
</template>
```

App.vue

```
<template>
  <BaseButton>
    Submit
  </BaseButton>
</template>
```

BaseButton.vue

```
<template>
  <button type=“button" class=“nice-button“>
    <slot/>
  </button>
</template>
```

App.vue

```
<template>
  <BaseButton>
    Submit
    <PulseLoader v-if="isLoading" color="#fff" size="6px"/>
    <AppIcon v-else icon=“arrow-right”/>
  </BaseButton>
</template>
```

PROBLEM

What if you want to define multiple slots?

Default Slot

NavigationLink.vue

```
<a
  v-bind:href="url"
  class="nav-link"
>
  <slot></slot>
</a>
```

```
<navigation-link url="/profile">
  <span class="fa fa-user”/>
  Your Profile
</navigation-link>
```

Named Slots

BaseLayout.vue

```
<div class="container">
  <header>
    <slot name="header"></slot>
  </header>
  <main>
    <slot></slot>
  </main>
  <footer>
    <slot name="footer"></slot>
  </footer>
</div>
```

```
<base-layout>
  <template v-slot:header>
    <h1>Here might be a page title</h1>
  </template>

  <p>A paragraph for the main content.</p>
  <p>And another one.</p>

  <template v-slot:footer>
    Here's some contact info
  </template>
</base-layout>
```

Dynamic Slot Names

```
<base-layout>
  <template v-slot:[dynamicSlotName]>
    ...
  </template>
</base-layout>
```

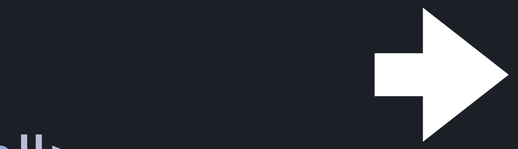
PROBLEM

How do you access child components data inside the slot?

Scoped Slots

Scoped Slots

```
// todo-list.vue
<ul>
  <li
   v-for="todo in todos"
   :key=“todo.id"
  >
    <slot :todo="todo">
      <!-- Fallback content -->
      {{ todo.text }}
    </slot>
  </li>
</ul>
```

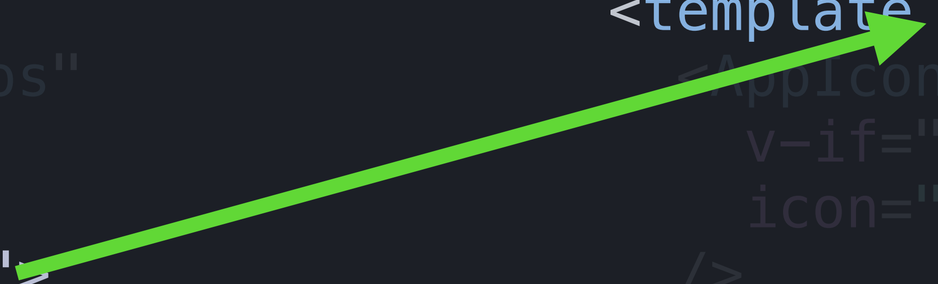


```
<todo-list :todos="todos">
  <template v-slot=“scope">
    <AppIcon
      v-if="scope.todo.completed"
      icon="checked"
    />
    {{ scope.todo.text }}
  </template>
</todo-list>
```

Scoped Slots

```
// todo-list.vue
<ul>
  <li
    v-for="todo in todos"
    :key="todo.id"
  >
    <slot :todo="todo">
      <!-- Fallback content -->
      {{ todo.text }}
    </slot>
  </li>
</ul>
```

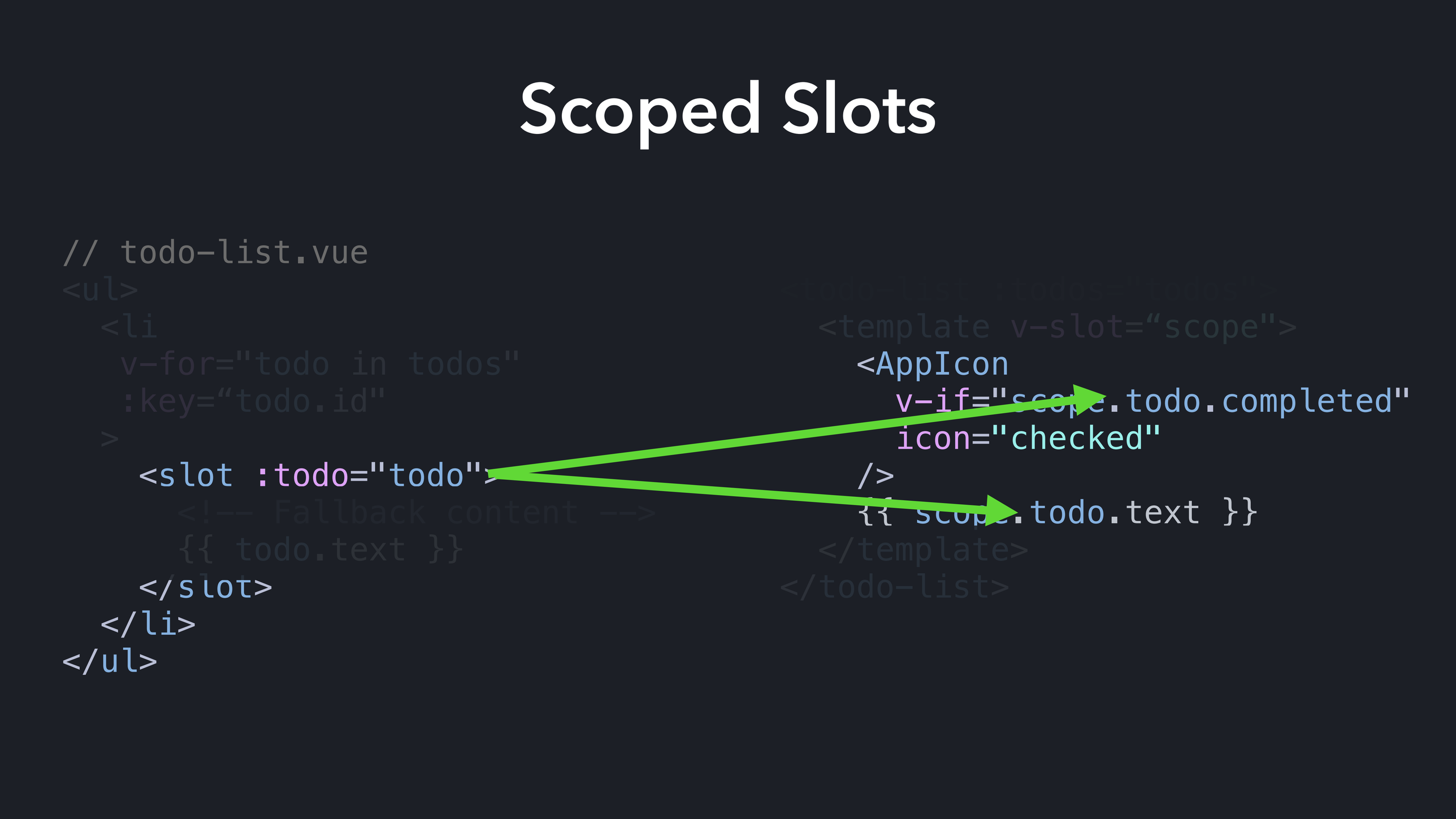
```
<todo-list :todos="todos">
  <template v-slot="scope">
    <AppIcon
      v-if="scope.todo.completed"
      icon="checked"
    />
    {{ scope.todo.text }}
  </template>
</todo-list>
```



Scoped Slots

```
// todo-list.vue
<ul>
  <li
    v-for="todo in todos"
    :key="“todo.id"
  >
    <slot :todo="todo">
      <!-- Fallback content -->
      {{ todo.text }}
    </slot>
  </li>
</ul>
```

```
<todo-list :todos="todos">
  <template v-slot="“scope">
    <AppIcon
      v-if="scope.todo.completed"
      icon="checked"
    />
    {{ scope.todo.text }}
  </template>
</todo-list>
```



Destructuring slot-scope

```
<todo-list :todos="todos">
  <template v-slot="scope">
    <AppIcon
      v-if="scope.todo.completed"
      icon="checked"
    />
    {{ scope.todo.text }}
  </template>
</todo-list>
```

```
<todo-list :todos="todos">
  <template v-slot="{ todo }">
    <AppIcon
      v-if="todo.completed"
      icon="checked"
    />
    {{ todo.text }}
  </template>
</todo-list>
```

Slot Shorthand

```
<todo-list :todos="todos">
  <template v-slot:todo="{ todo }">
    {{ todo.text }}
  </template>
</todo-list>

<todo-list :todos="todos">
  <template #todo="{ todo }">
    {{ todo.text }}
  </template>
</todo-list>
```

Slot Shorthand

```
<todo-list :todos="todos">
  <template v-slot:todo="{ todo }">
    {{ todo.text }}
  </template>
</todo-list>
```

```
<todo-list :todos="todos">
  <template #todo="{ todo }">
    {{ todo.text }}
  </template>
</todo-list>
```

Use slots for:

- Content distribution (like layouts)
- Creating larger components by combining smaller components
- Default content in Multi-page Apps
- Providing a wrapper for other components
- Replace default component fragments

Use scoped slots for:

- Applying custom formatting/template to fragments of a component
- Creating wrapper components
- Exposing its own data and methods to child components

Pros

- Great for creating reusable and *composable* components
- Receiving properties from slot-scope is explicit

Cons

- Properties received through slot-scope can’t be easily used in component script
  - However, you can pass those to methods inside the template as arguments

Questions?

Slots > Props

Composition > Configuration

With composition, you're less restricted
by what you were building at first.

With configuration, you have to document everything and
new requirements means new configuration.

Questions?

Live Demo

AppTooltip & AppDropdown

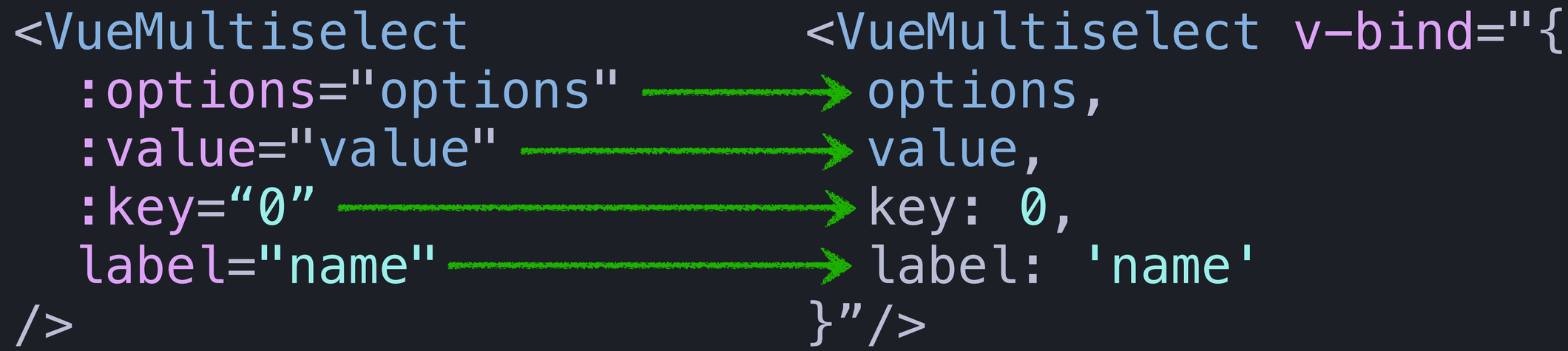
TECHNIQUE

```
v-bind="{ … }"
v-on="{ … }"
```

When working with multiple props consider...

```
<VueMultiselect
  :options="options"
  :value="value"
  :key=“0”
  label="name"
/>
```

When working with multiple props consider...



Practice

Workshop Repo Task #1:

Tasks:

1. Compose **AppSelect.vue** that uses **AppDropdown.vue**. Let it accept an array of options and the selected value.
2. Expose a default slot for showing the current value
3. Expose an option slot for modifying how the option list would look like.

COFFEE BREAK

Be back at 11:00AM!

Popular convention for classifying components

Container

aka smart components, providers

Presentational

aka dumb components, presenters

Container

- Application logic
- Application state
- Use Vuex
- Usually Router views

Presentational

- Application UI and styles
- UI-related state only
- Receive data from props
- Emit events to containers
- Reusable and *composable*
- Not relying on global state

Container

Examples:

`UserProfile, Product, TheShoppingCart, Login`

What is it doing?

Presentational

Examples:

`AppButton, AppModal, TheSidebar, ProductCard`

How does it look?

Should I **always** follow this convention?

Should I **always** follow this convention?

NO

Should I **always** follow this convention?

Not when:

- It leads to premature optimisations
- It makes simple things unnecessarily complex
- It requires you to create strongly coupled components (like feature-aware props in otherwise reusable components)
- It forces you to create unnecessary, one-time-use presenter components

Should I **always** follow this convention?

Instead

- Focus on keeping things simple (methods, props, template, Vuex modules, everything)
- Don’t be afraid to have UI and styles in your containers
- Split large, complicated containers into several smaller ones
- Use Composition API (Vue 3.0)

An update from Dan Abramov on

Presentational and Container Components medium article

> ***Update from 2019:** I wrote this article a long time ago and my views have since evolved. In particular, I don't* **suggest** *splitting your components like this anymore. If you find it natural in your codebase, this pattern can be handy. But I've seen it enforced without any necessity and with almost dogmatic fervor far too many times. The main reason I found it useful was because it let me separate complex stateful logic from other aspects of the component. Hooks let me do the same thing without an arbitrary division. This text is left intact for historical reasons but don't take it too seriously.*

BEST PRACTICE

Naming Components

Actual programming

Debating for 30 minutes on how to name a variable

Recommended **Naming Conventions**

Avoid single word components

~~Header.vue~~

~~Button.vue~~

~~Container.vue~~

Recommended **Naming Conventions**

AppPrefixedName.vue / **Base**PrefixedName.vue

Reusable, globally registered UI components.

`AppButton, AppModal, BaseDropdown, BaseInput`

ThePrefixedName.vue

Single-instance components where only 1 can be active at the same time.

`TheShoppingCart, TheSidebar, TheNavbar`

Recommended **Naming Convention**

Tightly coupled/related components

TodoList.vue
TodoListItem.vue
TodoListItemName.vue

1. Easy to spot relation
2. Stay next to each other in the file tree
3. Name starts with the highest-level words

More conventions:

https://vuejs.org/v2/style-guide/

- Single-file component filename casing
- Base component names
- Single-instance component names
- Tightly coupled component names

And more...

BEST PRACTICE

Naming Component Methods

Use descriptive names

❌ `onInput`

✅ `updateUserName`

Don’t assume where it will be called

```
updateUserName ($event) {
  this.user.name = $event.target.value
}
```

❌ Wrong

```
updateUserName (newName) {
  this.user.name = newName
}
```

✅ Correct

Prefer destructuring over multiple arguments

```
updateUser (userList, index, value, isOnline) {
  if (isOnline) {
    userList[index] = value
  } else {
    this.removeUser(userList, index)
  }
}
```

Prefer destructuring over multiple arguments

```
updateUser (userList, index, value, isOnline) {
  if (isOnline) {
    userList[index] = value
  } else {
    this.removeUser(userList, index)
  }
}
```

❌ Not recommended

```
updateUser ({ userList, index, value, isOnline }) {
  if (isOnline) {
    userList[index] = value
  } else {
    this.removeUser(userList, index)
  }
}
```

✅ Recommended

PROBLEM

How to dynamically switch components based on data?

TECHNIQUE

<Component :is=“name”>

```
<template>
  <div>
    <Component :is=“clockType" :time=“time”/>
  </div>
</template>

<script>
export default {
  components: { DigitalClock },
  computed: {
    clockType () {
      if (this.selectedClock === 'analog') {
        return () => import(‘./components/AnalogClock’)
      } else {
        return 'DigitalClock'
      }
    }
  }
  // ...
}
</script>
```

<Component :is>

Becomes the component specified by the **:is** prop.

Pros

- Extremely powerful and flexible
- Easy to use
- Can accept props
- Can accept asynchronous components
- Can change into different components
- You can make a router-view out of it

Cons

- Got to handle props carefully

DESIGN PATTERN

Vendor Components Wrapper

BaseIcon.vue

```
<template>
  <FontAwesomeIcon
    v-if="source === 'font-awesome'"
    :icon="name"
  />
  <span
    v-else
    :class="customIconClass"
  />
</template>
```

Hat tip to Chris Fritz

```
<template>
  <p>
    <BaseIcon icon=“earth” />
    <BaseIcon icon="fire" />
    <BaseIcon icon="water" />
    <BaseIcon icon="water" />
  </p>
</template>
```

DESIGN PATTERN

Transparent Components

When passing props, listeners, and attributes...

```
// BaseInput.vue
<template>
  <div>
    <input
      type="text"


    />
  </div>
</template>
```

When passing props, listeners, and attributes...

```
<BaseInput
  @input="filterData"
  label="Filter results"
  placeholder="Type in here..."
/>
```

```
// BaseInput.vue
<template>
  <div>
    <input
      type="text"
    />
  </div>
</template>
```

When passing props, listeners, and attributes...

```
<BaseInput
  @input="filterData"
  label="Filter results"
  placeholder="Type in here..."
/>
```

```
// BaseInput.vue
<template>
  <div>
    <input
      type="text"
    />
  </div>
</template>
```

When passing props, listeners, and attributes...

```
<template>
  <div>
    <input
      type="text"


    />
  </div>
</template>

<script>
export default {
  inheritAttrs: false,
  // ...
}
</script>
```

Both props and attributes, as well as all listeners will be passed to this element instead.

Prevent Vue from assigning attributes to top-level element

When passing props, listeners, and attributes…

```
<template>
  <div>
    <input
      type="text"
      v-bind="{ …$attrs, …$props }"
      v-on="$listeners"
    />
  </div>
</template>

<script>
export default {
  inheritAttrs: false,
  // ...
}
</script>
```

PROBLEM

How to avoid repetition when using component composition through slots?

DESIGN PATTERN

Functional Components

```
<AppButton>
  Submit
  <PulseLoader v-if="isLoading" color="#fff" size="6px"/>
  <AppIcon v-else icon=“arrow-right”/>
</AppButton>
```

Save the composition as a component.

```
// SubmitButton.vue
<template>
  <AppButton>
    Submit
    <PulseLoader v-if="isLoading" color="#fff" size="6px"/>
    <AppIcon v-else icon=“arrow-right”/>
  </AppButton>
</template>
```

It can be a functional component.

```
// SubmitButton.vue
<template functional>
  <AppButton v-on="listeners">
    Submit
    <PulseLoader v-if="props.isLoading" color="#fff" size="6px"/>
    <AppIcon v-else icon="arrow-right"/>
  </AppButton>
</template>
```

⚠️ Remember to forward props

Vue-CLI Apps support JSX

```
const MyFunctionalComponent = ({ props }) => <div>
  { props.message }
</div>
```

This will translate into:

```
const MyFunctionalComponent = {
  functional: true,
  render (h, { props }) {
    return <div>{ props.message }</div>
  }
}
```

Vue-CLI Apps support JSX

```
const MyFunctionalComponent = ({ props }) => <div>
  { props.message }
</div>
```

In Vue 3.0 this will be the default way to create functional components.
Just functions.

Questions?

Practice

Workshop Repo Task #2:

1. Create a **ConfirmationModal.vue** that uses **AppModal** to that accepts a question and contains two buttons: "Confirm" and "Cancel"
2. Make the **ConfirmationModal** component emit a '**confirm**' event when clicked on ‘Confirm' button. And a 'close' event when clicking on 'Cancel'.
3. Display the confirmation question before the button, similar to the example below.
4. Make sure the **ConfirmationModal** looks like the example, this includes the H3 styling and buttons positioning.

LUNCH BREAK

Be back at 1:45PM!

PRO TIP

SFC Code Block Order

```
<template>
<!-- ... -->
</template>


<script>
export default {
// ...
}
</script>


<style>
/* ... */
</style>
```

```
<script>
export default {
// ...
}
</script>


<template>
<!-- ... -->
</template>

<style>
/* ... */
</style>
```

```
<script>
export default {
// ...
}
</script>
```

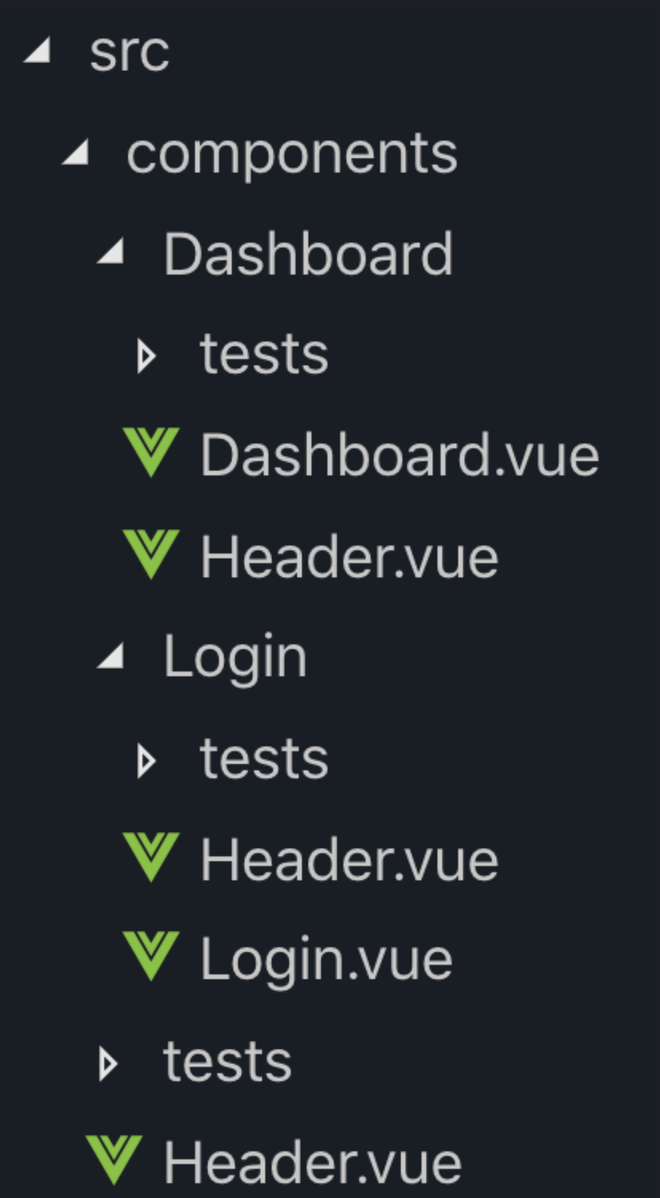
```
<template>
<!-- ... -->
</template>


<style>
/* ... */
</style>
```

```
<script>
export default {
// ...
}
</script>


<template>
<!-- ... -->
</template>


<style>
/* ... */
</style>
```

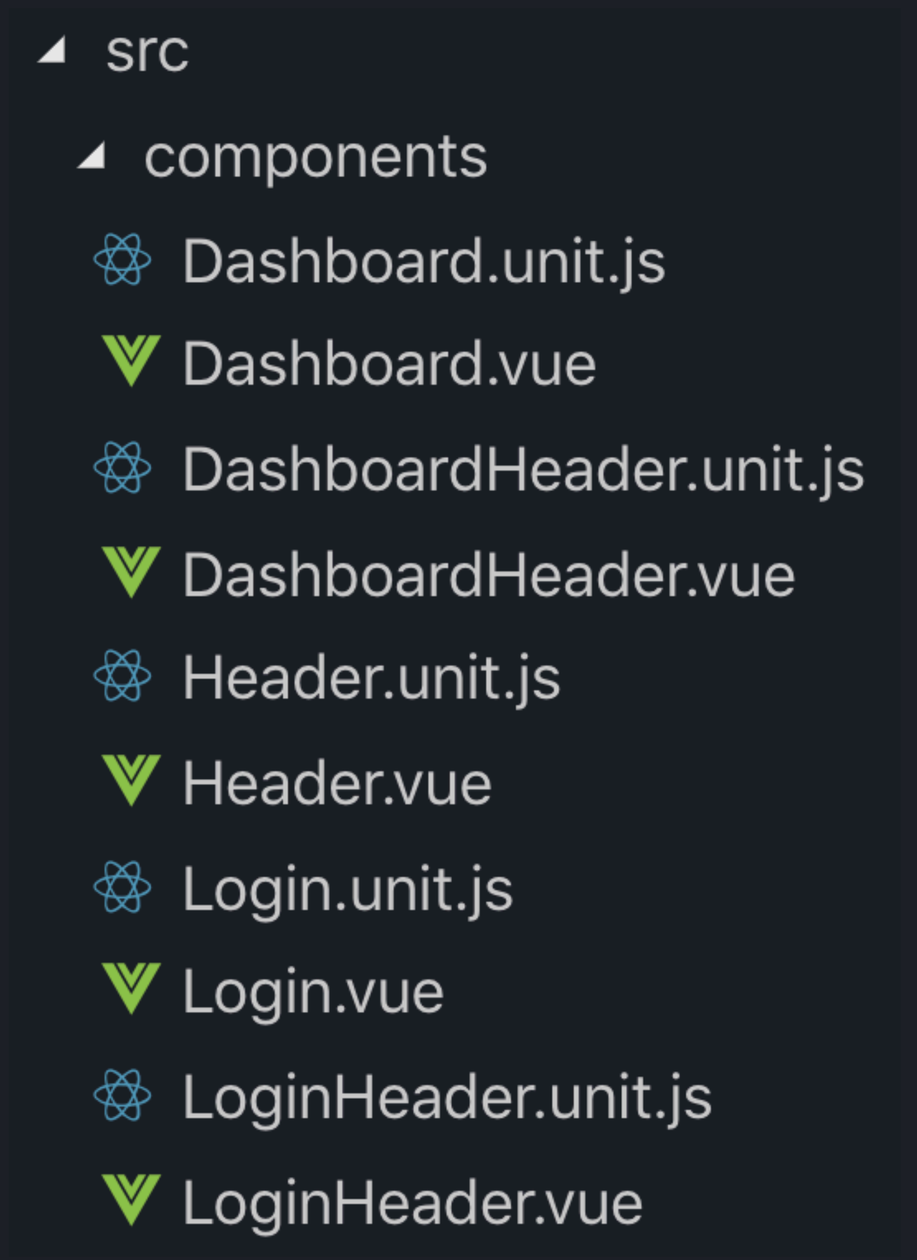
PRO TIP

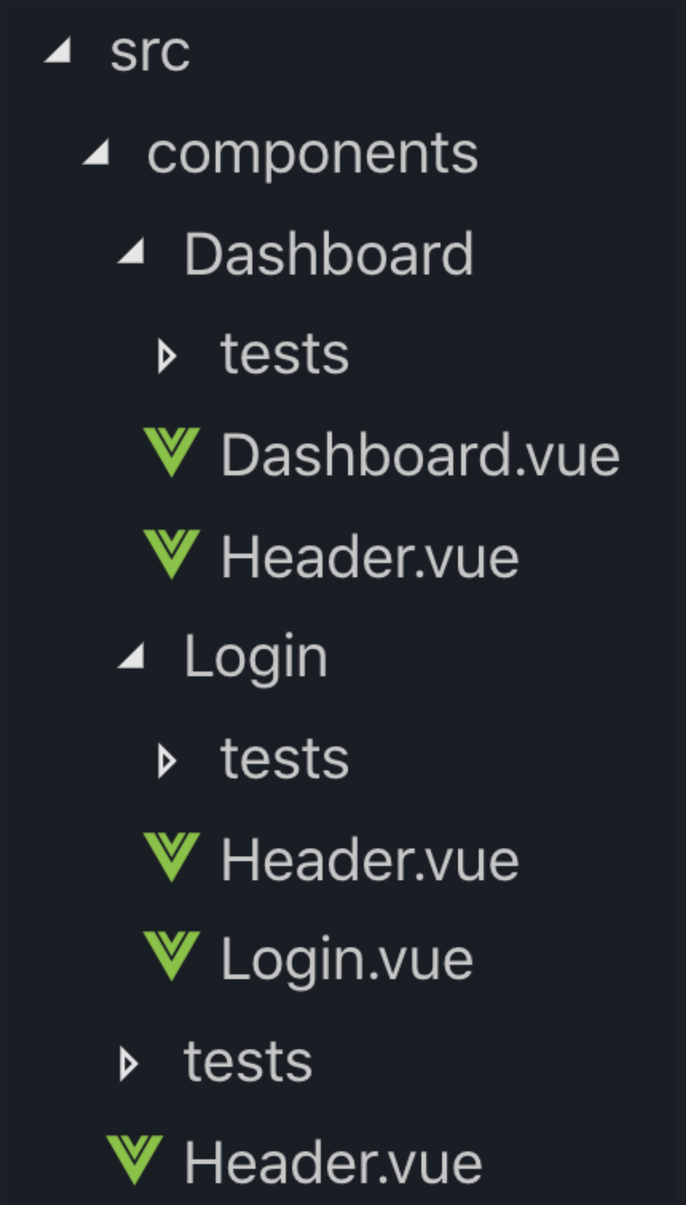
How to Organize Component Files

Nested Structure

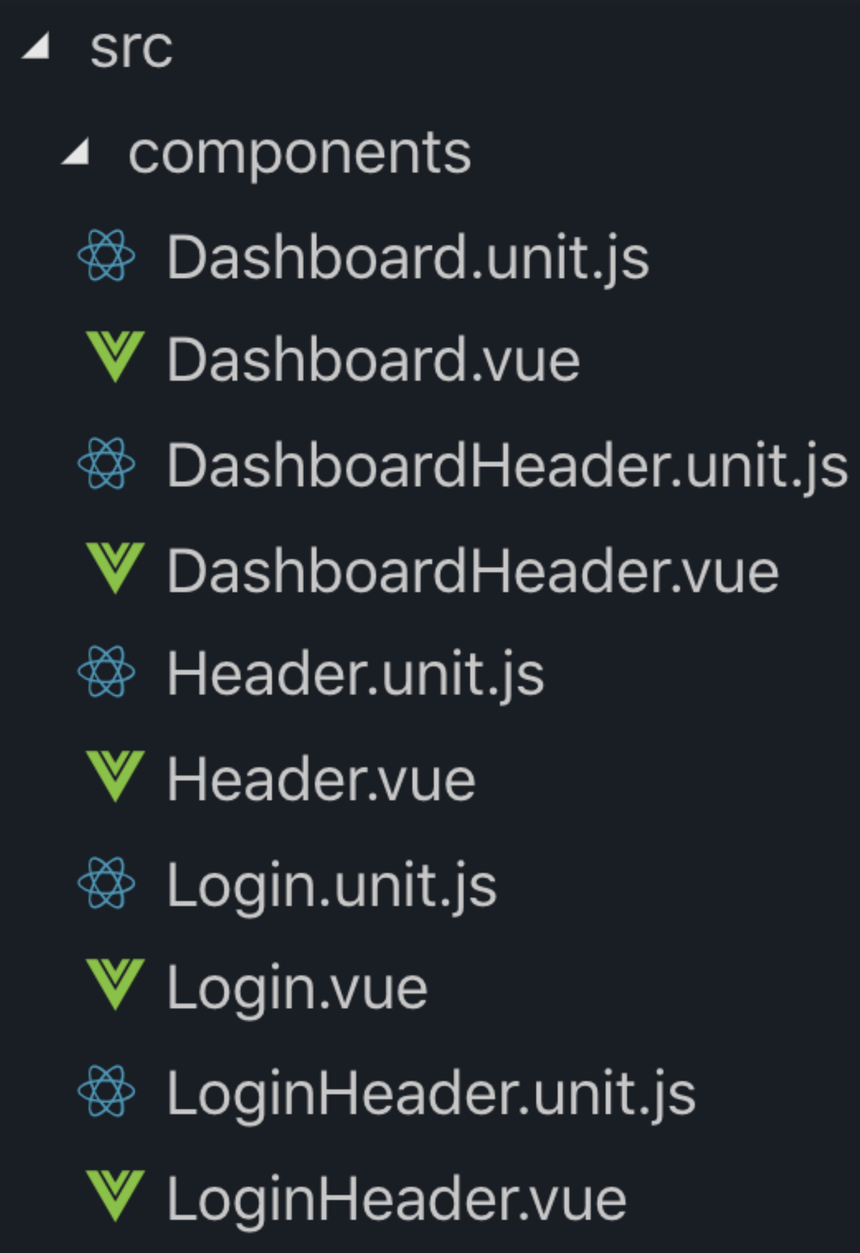


Flat Structure




src
components
Dashboard
tests
Dashboard.vue
Header.vue
Login
tests
Header.vue
Login.vue
tests
Header.vue

VS


src
components
Dashboard.unit.js
Dashboard.vue
DashboardHeader.unit.js
DashboardHeader.vue
Header.unit.js
Header.vue
Login.unit.js
Login.vue
LoginHeader.unit.js
LoginHeader.vue

Component Organization

Flat makes refactoring easier

No need to update imports if components move

Flat makes finding files easier

Folders often leads to lazily named files
because they don’t have to be unique

Hat tip to Chris Fritz

PRO TIP

Register base components globally

Instead of every component having:

```
import BaseButton from ‘./components/BaseButton.vue'
import BaseIcon from ‘./components/BaseIcon.vue'
import BaseInput from ‘./components/BaseInput.vue'
```

Use this epic script by Chris Fritz:

https://vuejs.org/v2/guide/components-registration.html#Automatic-Global-Registration-of-Base-Components

```
import Vue from 'vue'
import upperFirst from 'lodash/upperFirst'
import camelCase from 'lodash/camelCase'

const requireComponent = require.context(
  './components',
  false,
  /Base[A-Z]\w+\.(vue|js)$/
)

requireComponent.keys().forEach(fileName => {
  const componentConfig = requireComponent(fileName)

  const componentName = upperFirst(
    camelCase(
      fileName
        .split('/')
        .pop()
        .replace(/\.\w+$/, '')
    )
  )

  // Register component globally
  Vue.component(
    componentName,
```

TECHNIQUE

EventBus

```
// event-bus.js
import Vue from 'vue';
const EventBus = new Vue();
export default EventBus;
```

```
// component-a.js
import Vue from 'vue';
import EventBus from './event-bus';
Vue.component('component-a', {
  ...
  methods: {
    emitMethod () {
       EventBus.$emit('EVENT_NAME', payLoad);
    }
  }
});
```

```
// component-b.js
import Vue from 'vue';
import EventBus from './event-bus';
Vue.component(‘component-b’, {
  ...
  mounted () {
    EventBus.$on(‘EVENT_NAME’, function (payLoad) {
      ...
    });
  }
});
```

It can be very helpful…

But we **strongly advise against** using it for global state management.

PROBLEM

How to share the same functionality across different components?

TECHNIQUE

Mixins

https://vuejs.org/v2/guide/mixins.html

A mixin

```
const myMixin = {
  data () {
    return {
      foo: 'bar'
    }
  }
}

export default {
  mixins: [myMixin],
  // component code
}
```

Mixin as a function

```
const myMixin = (defaultFoo) => ({
  data () {
    return {
      foo: defaultFoo
    }
  }
})

export default {
  mixins: [myMixin(10)],
  // component code
}
```

Only use mixins when:

You need to share component logic between multiple components

Unless

You can extract the shared logic to a component.

You most likely can.

Pros

- Relatively easy to use

Cons

- Possible properties name clashes.
- Can’t share template fragments
- Gets harder to track where things are coming from once there are more mixins

Questions?

Instead of Mixins use…

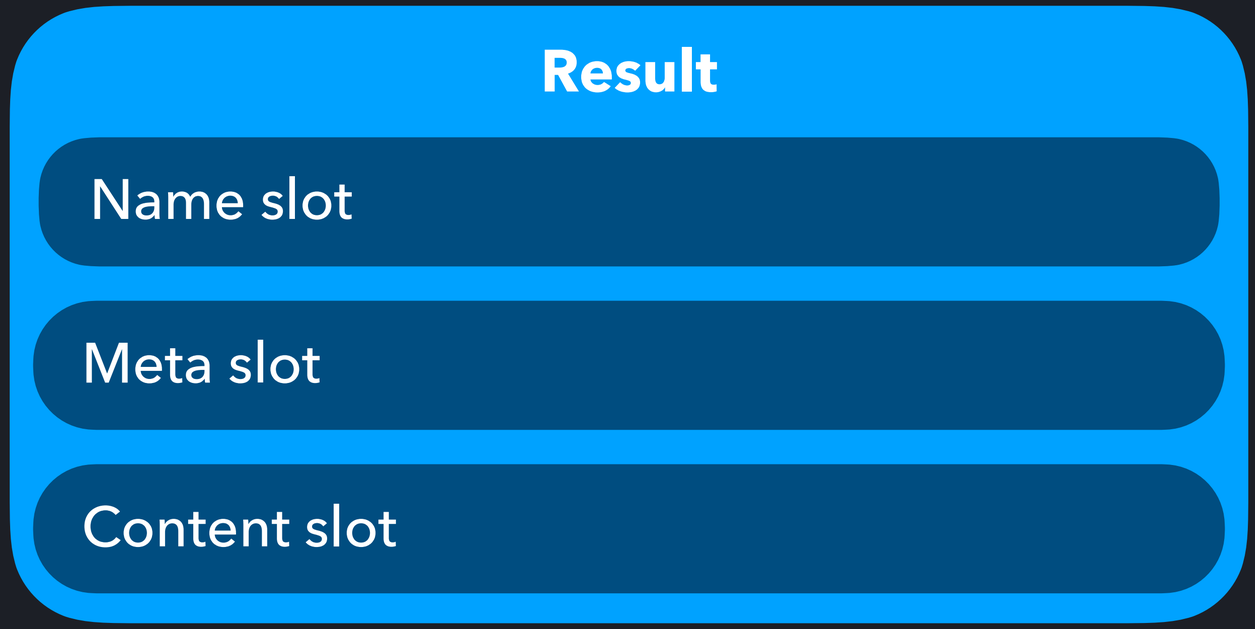
Composition API

When Vue 3.0 is here*

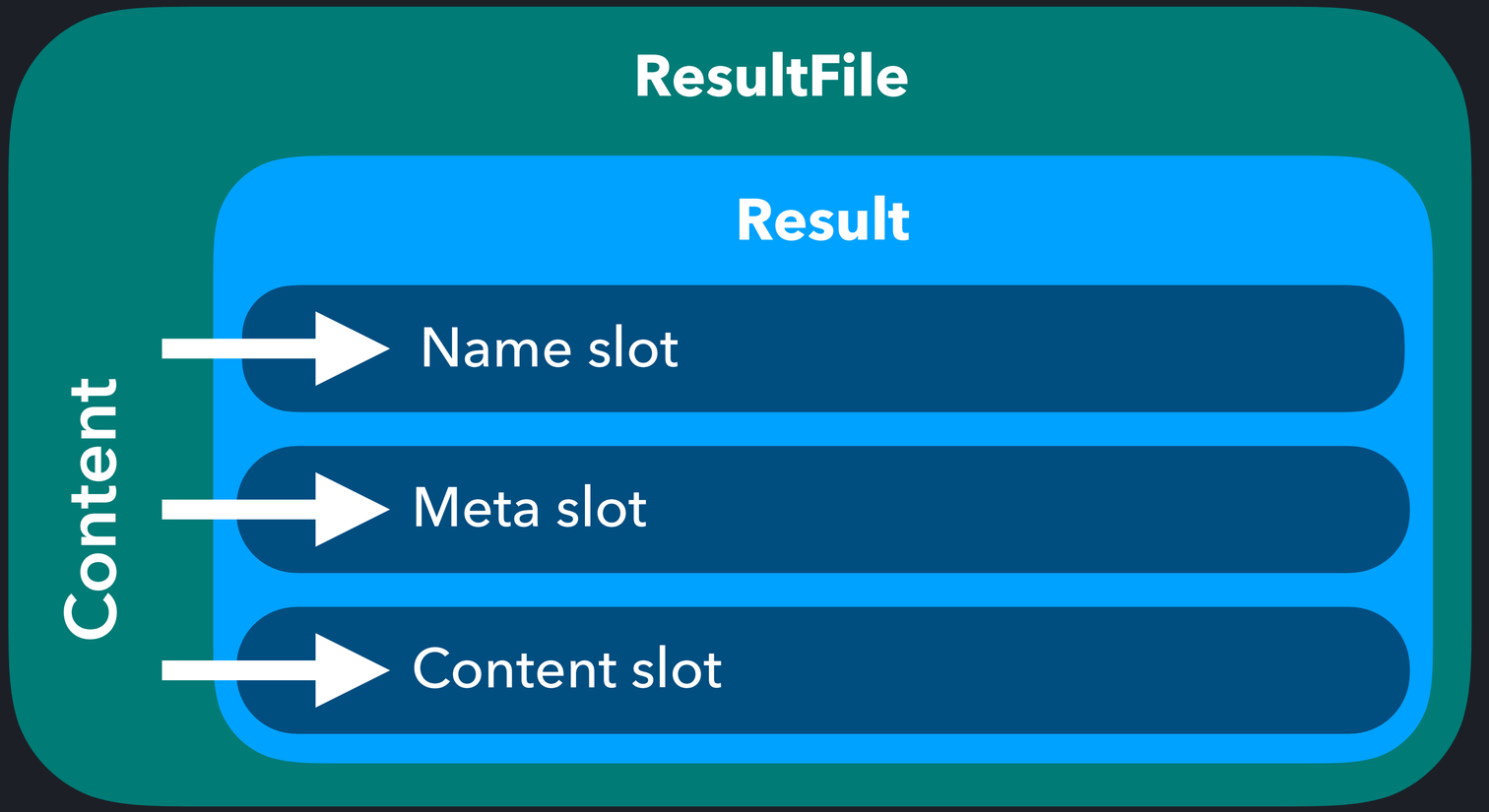
Unless you need to share the UI too then use…

“Composition over inheritance”

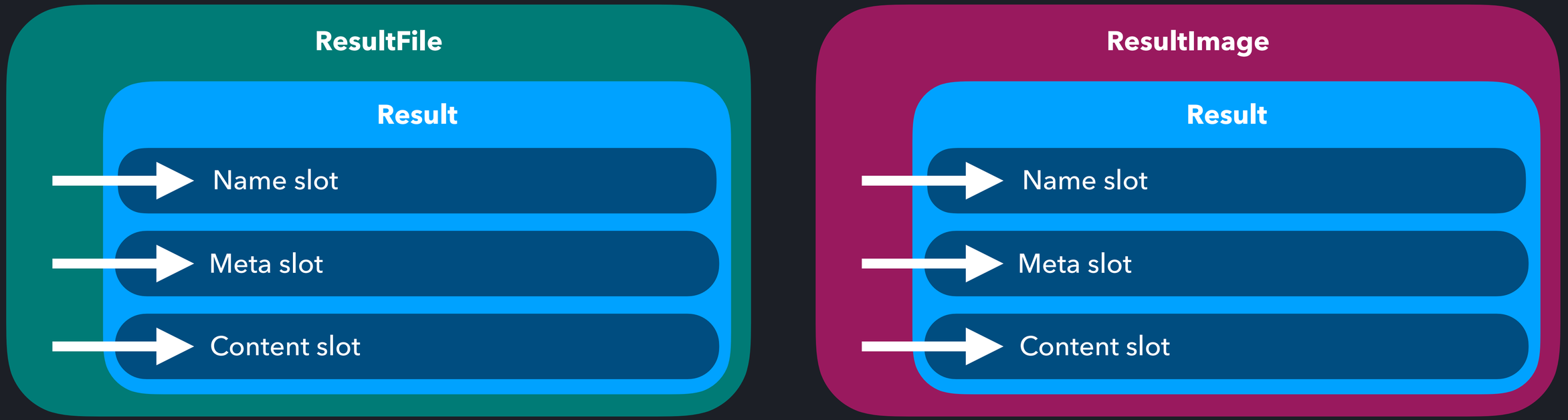
“Composition over inheritance”



“Composition over inheritance”



"Composition over inheritance"



Live Demo

Questions?

Practice: Task #3

http://localhost:8080/#/tasks/3

Tasks:

1. Create the **NewsEvent.vue** component that will handle the "event" type news from the newsFeed.
2. Similar to **NewsAd** and **NewsPost**, make use of the **BaseNews** component as a method to share code.

Real life code example

https://github.com/CodePilotai/codepilot/blob/master/src/renderer/components/search-results-item-issue.vue

https://github.com/CodePilotai/codepilot/blob/master/src/renderer/components/search-results-item.vue

...and other files starting with “search-result-item-“

PROBLEM

How to pass data and methods deep into the component tree?

TECHNIQUE

Provide/Inject

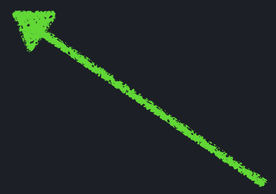
https://vuejs.org/v2/api/#provide-inject

Provide/Inject

```
export default {
  provide () {
    return {
      width: this.width, // will stay reactive
      key: ‘name’, // won’t be reactive
      fetchMore: this.fetchMore // methods can be passed
    }
  },
  data() {
    return {
      width: null,
    }
  },
  methods: {
    fetchMore () {
      // ...
    }
  }
}
```

Provide/Inject

```
export default {
  inject: ['width', 'key', ‘fetchMore'],
  props: {
    optionKey: {
      type: String,
      default () {
        return this.key
      }
    }
  }
}
```



Injected values can be used as default props and data values

Pros

- Easy sharing data and methods with descendants
- Helps avoiding unnecessary props
- Components can choose which properties to inject
- Can be used to provide default props and data values

Cons

- Besides observable objects defined in data, other properties are not reactive
  - Example: computed properties won’t update
- Pretty clumsy usage, due to some properties staying reactive, where other don’t
- Requires complicated setup to make other properties reactive
- Better suited for plugins and component libraries rather than regular applications

Provide and inject are primarily provided for advanced plugin / component library use cases. It is NOT recommended to use them in generic application code.

Make provide/inject reactive

https://github.com/LinusBorg/vue-reactive-provide

Questions?

PROBLEM

What if you only want to expose and/or manage data and methods, but no user interface?

“Provider” components

“Provider” components

```
<ApolloQuery
  :query="require('../graphql/HelloWorld.gql')"
  :variables="{ name }"
>
  <template v-slot="{ result: { loading, error, data } }">
    <!-- Loading -->
    <div v-if="loading" class="loading apollo">Loading...</div>
    <!-- Error -->
    <div v-else-if="error" class="error apollo">An error occured</div>
    <!-- Result -->
    <div v-else-if="data" class="result apollo">{{ data.hello }}</div>
```

From Vue Apollo by @akryum

“Provider” components

```
<ApolloQuery
  :query="require('../graphql/HelloWorld.gql')"
  :variables="{ name }"
>
  <template v-slot="{ result: { loading, error, data } }">
    <!-- Loading -->
    <div v-if="loading" class="loading apollo">Loading...</div>
    <!-- Error -->
    <div v-else-if="error" class="error apollo">An error occured</div>
    <!-- Result -->
    <div v-else-if="data" class="result apollo">{{ data.hello }}</div>
```

From Vue Apollo by @akryum

“Provider” components

```
<ApolloQuery
  :query="require('../graphql/HelloWorld.gql')"
  :variables="{ name }"
>
  <template v-slot="{ result: { loading, error, data } }">
    <!-- Loading -->
    <div v-if="loading" class="loading apollo">Loading...</div>
    <!-- Error -->
    <div v-else-if="error" class="error apollo">An error occured</div>
    <!-- Result -->
    <div v-else-if="data" class="result apollo">{{ data.hello }}</div>
```

From Vue Apollo by @akryum

“Provider” components

```
<ApolloQuery
  :query="require('../graphql/HelloWorld.gql')"
  :variables="{ name }"
>
  <template v-slot="{ result: { loading, error, data } }">
    <!-- Loading -->
    <div v-if="loading" class="loading apollo">Loading...</div>
    <!-- Error -->
    <div v-else-if="error" class="error apollo">An error occured</div>
    <!-- Result -->
    <div v-else-if="data" class="result apollo">{{ data.hello }}</div>
```

From Vue Apollo by @akryum

DESIGN PATTERN

Renderless Components

```
export default {
  data () {
    return {
      x: 0,
      y: 0
    }
  },
  render () {
    return this.$scopedSlots.default({ x: this.x, y: this.y })
  },
  mounted () {
    window.addEventListener('mousemove', this.handleMouseMove)
  },
  beforeDestroy () {
    window.removeEventListener('mousemove', this.handleMouseMove)
  },
  methods: {
    handleMouseMove (e) {
      this.x = e.x
      this.y = e.y
    }
  }
}
```

Consuming the WithMousePos Renderless provider couponent

```
<WithMousePos>
  <template v-slot="{ x, y }">
    {{ x }}, {{ y }}
  </template>
</WithMousePos>
```

Live Coding

MousePosition

Vue 3.0 Alternative

WIP

PREVIEW

Composition API

When Vue 3.0 is here*

```
export default {
  data () {
    return {
      x: 0,
      y: 0
    }
  },
  render () {
    return this.$scopedSlots.default({ x: this.x, y: this.y })
  },
  mounted () {
    window.addEventListener('mousemove', this.handleMouseMove)
  },
  beforeDestroy () {
    window.removeEventListener('mousemove', this.handleMouseMove)
  },
  methods: {
    handleMouseMove (e) {
      this.x = e.x
      this.y = e.y
    }
  }
}
```

```
import { ref, onMounted, onUnmounted } from '@vue/composition-api'

export default function useMousePos () {
  const x = ref(0)
  const y = ref(0)

  onMounted(() => {
    window.addEventListener('mousemove', handleMouseMove)
  })

  onUnmounted(() => {
    window.removeEventListener('mousemove', handleMouseMove)
  })

  const handleMouseMove = (e) => {
    x.value = e.x
    y.value = e.y
  }

  return { x, y }
}
```

Consuming the useMousePos Composition function

```
<script>
export default {
  setup () {
    const { x, y } = useMousePos()
    return { mouseX: x, mouseY: y }
  }
}
</script>
```

https://vue-composition-api-rfc.netlify.com/

Questions?

Practice

http://localhost:8080/#/tasks/4

Tasks:

1. Create a renderless component called FetchData
2. Make it accept a URL props where you can pass a url to be fetched.
3. Depending on the status: pending, error or resolved (data fetched), make it render different slots to match the use case below.
4. **Advanced**: Create a Composition-API based Solution

COFFEE BREAK

Be back at 4:00PM!

BEST PRACTICES

Managing Styles

  CSS

TECHNIQUE

Global Styles

```
<template>
  <p class="red">
    This should be red
  </p>
</template>


<style>
.red {
  color: red;
}
.bold {
  font-weight: bold;
}
</style>
```

TECHNIQUE

Inline Styles

```
<template>
  <p :style="`color: ${themeColor}`">
    This should be red
  </p>
</template>
```

TECHNIQUE

Scoped Styles

```
<template>
  <p class="red">
    This should be red
  </p>
</template>


<style scoped>
.red {
  color: red;
}
.bold {
  font-weight: bold;
}
</style>
```

```
<template>
  <p class="red">
    This should be red
  </p>
</template>

<style scoped>
.red {
  color: red;
}
.bold {
  font-weight: bold;
}
</style>
```

```
<template>
  <p class="red"
     data-f3f3eg9
  >
    This should be red
  </p>
</template>

<style scoped>
.red[data-f3f3eg9] {
  color: red;
}
.bold[data-f3f3eg9] {
  font-weight: bold;
}
</style>
```

TECHNIQUE

CSS Modules

```
<template>
  <p :class="$style.red">
    This should be red
  </p>
</template>


<style module>
.red {
  color: red;
}
.bold {
  font-weight: bold;
}
</style>
```

```
<template>
  <p :class="$style.red">
    This should be red
  </p>
</template>

<style module>
.red {
  color: red;
}
.bold {
  font-weight: bold;
}
</style>
```

```
<p class=“red-xhjd1">
  This should be red
</p>

<style>
.red-xhdj1 {
  color: red;
}
</style>
```

Questions?

BEST PRACTICE

When to Refactor Your Components

Premature optimization is the root of all evil (or at least most of it) in programming.

- Donald Knuth

Data Driven Refactoring

Signs you need more components

- When your components are hard to understand
- You feel a fragment of a component could use its own state
- Hard to describe what what the component is actually responsible for

Components and how to find them?

- Look for similar visual designs
- Look for repeating interface fragments
- Look for multiple/mixed responsibilities
- Look for complicated data paths
- Look for *v-for* loops
- Look for large components

Questions?

BEST PRACTICE

Components + Vuex

Tips for **using Vuex**

State

Tips for **using Vuex**

What data to put into Vuex?

- Data shared between components that might not be in direct parent-child relation
- Data that you want to keep between router views (for example lists of records fetched from the API)
  - Route params are more important though (as a source of truth)
- Any kind of global state
  - Examples: login status, user information, global notifications
- Anything if you feel it will make managing it simpler

Tips for **using Vuex**

What data **NOT** to put into Vuex?

- User Interface variables
  - Examples: `isDropdownOpen`, `isInputFocused`, `isModalVisible`
- Forms data.
- Validation results.
- Single records from the API
  - Think: `currentlyViewedProduct`

Tips for **using Vuex**

Getters

Tips for **using Vuex**

Do I need to **always** use a **getter** to return a simple fragment of state?

No.

Feel free to access state directly

```
this.$store.state.usersList
```

Use computed properties to return computed state

```
activeUsersList () {
  return this.$store.state.usersList.filter(
    user => user.isActive
  )
}
```

Tips for **using Vuex**

If you need to share derived Vuex state between components, make it a getter.

You should weigh the trade-offs and make decisions that fit the development needs of your app.

Tips for **using Vuex**

Use **mapState** and **mapGetters** helpers

```
computed: {
  ...mapState({
    userName: state => state.user.name
  }),
  ...mapGetters([
    'activeUsersList'
  ]),
  // local computed properties
}
```

Tips for **using Vuex**

Mutations & Actions

Tips for **using Vuex**

Do I need to **always** create an **action** to call a **mutation**?

No.

Feel free to directly commit mutations inside components

```
this.$store.commit('UPDATE_USER', { id, name, isActive })
```

Or use the **mapMutations** helper

```
methods: {
  ...mapMutations({
    updateUser: 'UPDATE_USER'
  })
  // methods
}
```

Tips for **using Vuex**

Think about actions as shared, global methods that connect with a remote API and only affect data stored in Vuex.

If there is no asynchronous part, just use a mutation.

Tips for **using Vuex**

Use modules

https://vuex.vuejs.org/guide/modules.html

Questions?

PROBLEM

Manage data deep in the component tree without mutating it.

Schema Generated Form

Live Coding
SchemaForm

Practice

http://localhost:8080/#/tasks/5

Tasks:

1. Create a **FormSelect** component that uses the **AppSelect** component or a regular select element that accepts an array of options.
2. Add a Country field to the schema that uses the newly created **FormSelect** and provide a few countries to select from.
3. If the user checks the isVueFan checkbox, extend the schema with an additional text input that asks for feedback.

PROBLEM

What if you need to extend a component’s template,
but don't have access to its slots?

Higher-Order Components

Higher-Order Components

A function that accepts a component as an argument and returns a modified version of that component.

```
function WithMessage (Component) {
  // code
  return ModifiedComponent
}
```

Higher-Order Components

It can also wrap an existing Component within a different component (using slots) or a custom template.

```
function WithMessage (Component) {
  const ModifiedComponent = ({ props }) => <div>
    <Component { ...props } />
    With added message { props.message }
  </div>

  return ModifiedComponent
}
```

Advanced Practice

http://localhost:8080/#/tasks/5

Tasks:

1. Use a Higher-Order Component to wrap the Form-Components to display the `description` prop on the side of the input.
2. Replace all Form Components with a version created by the HoC.

Questions?

Final Thoughts

Things We Learned Today

PART 1

- Introductions
- Component Basics
- Props
- Slots
- Named Slots
- Scoped Slots
- Task #1
- v-bind="{...}" || v-on="{...}"

PART 2

- Container vs Presentational Paradigm
- Best Practices: Naming
- <Component :is=“...” />
- Vendor Component Wrapper
- Transparent Components
- Functional Components
- Task #2

PART 3

- Task #3
- Mixins
- Pro Tip: Organization
- EventBus
- Provide / Inject
- Provider
- Composition API
- Task #4

PART 4

- When to Refactor
- Managing Styles
- Vuex + Components
- Higher Order Components
- Task #5

Questions?

🎊 CONGRATULATIONS! 🎊

Thank you!

Damian Dulisz

GitHub: @shentao

Twitter: @damiandulisz

Email: damian@dulisz.com

https://damiandulisz.typeform.com/to/I8zZdS

Open Practice Time

Clone and install

https://github.com/ridiculously-reusable-components/kanban-board-app

Or use your own application!

The example app uses **Tailwind CSS**. Read more:

https://tailwindcss.com/docs/examples/buttons