

Vaadin 10

Web Components } > Java

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Web Components

FOUR HTML5 SPECIFICATIONS

1. Custom Elements
2. Templates
3. HTML imports (ES6 modules)
4. Shadow DOM



Custom Elements

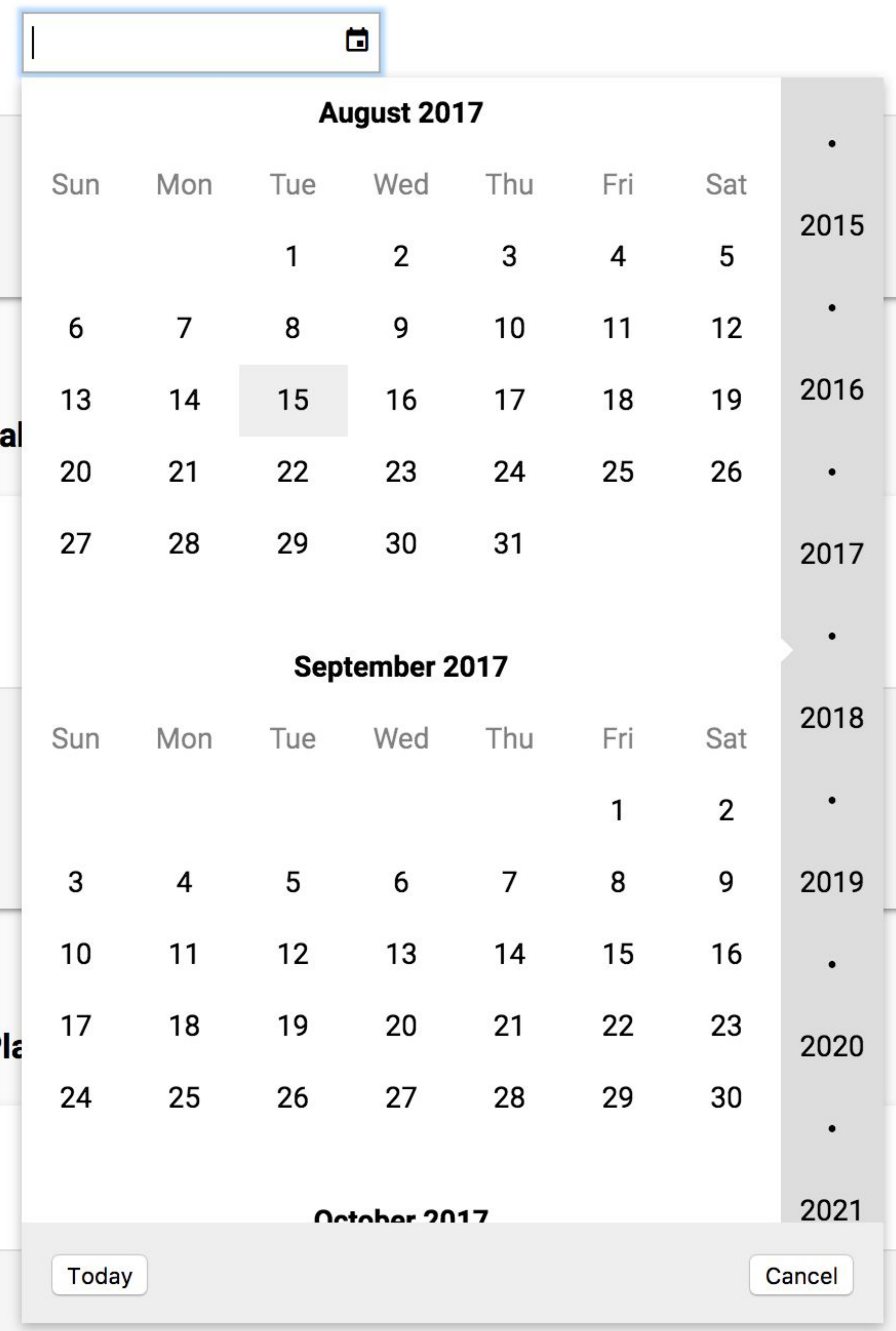
```
<my-new-element></my-new-element>
```

dd/mm/yyyy

February 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	1	2	3	4

```
<input type="date">
```



```
<vaadin-date-picker>  
</vaadin-date-picker>
```

Templates

```
<template id="my-template">
  <style>
    ...
  </style>
  <div>
    <h1>Web Components</h1>
    
  </div>
</template>
```



HTML Imports

```
<link rel="import" href="my-el.html">
```


SHADOW DOM

```
<video src="video-src.mp4" controls></video>
```

```
<video src="video-src.mp4" controls></video>
```



```
<video src="video-src.mp4" controls></video>
```



```
Q | Elements | Network | Sources | Timeline | Profiles | Resources | Audits | Console | AngularJS
▼ <html>
  <head></head>
  ▼ <body>
    ▼ <video controls src="http://www.craftymind.com/factory/html5video/BigBuckBunny_640x360.mp4">
      ▼ #shadow-root (user-agent)
        ▼ <div>
          ▼ <div>
            ▼ <div style="transition: opacity 0.1s; -webkit-transition: opacity 0.1s; opacity: 1;">
              ▶ <input type="button">
              ▶ <input type="range" step="any" max="27.3707">
              <div style>0:00</div>
              <div style="display: none;">0:27</div>
              ▶ <input type="button">
              ▶ <input type="range" step="any" max="1" style>
              ▶ <input type="button" style="display: none;">
```

Benefits of using Web Components

- Encapsulation
- Reusability



Browser support



 TEMPLATES

✓ STABLE

✓ STABLE

✓ STABLE

✓ STABLE

✓ STABLE

 CUSTOM ELEMENTS

✓ STABLE

✓ STABLE

✓ STABLE

✓ POLYFILL
● DEVELOPING

✓ POLYFILL
● CONSIDERING

 SHADOW DOM


✓ STABLE

✓ STABLE

✓ STABLE

✓ POLYFILL
● DEVELOPING

✓ POLYFILL
● CONSIDERING

 `<SCRIPT
TYPE="MODULE">`

✓ STABLE

✓ STABLE

✓ STABLE

● FLAG IN 54

✓ STABLE

 HTML IMPORTS

✓ STABLE

✓ STABLE

✓ POLYFILL
● ON HOLD

✓ POLYFILL
● ON HOLD

✓ POLYFILL
● CONSIDERING

YouTube

https://www.youtube.com

Haku

ytd-app 1261 x 3286

KIRJAUDU SISÄÄN

TILAA 1,2 T.

Luistelu – aihekanava Kanavasuositus

12:22

4:17

5:13

10:30

3:15

Esa Tikkanen

Juuso Nikander
119 t. näyttökertaa •
2 kuukautta sitten

Jääkiekon MM 2011 Suomi - Saksa [FIN-GER] Rankkarikisa

GUUSYSI
801 t. näyttökertaa •
6 vuotta sitten

Kärpät - Tappara 1-0 | Game 6 | Aleksis Mäkelä Voittomaali

Skyx Gaming
34 t. näyttökertaa •
6 päivää sitten

Patrik Laine - Away Broadcaster Reactions

Winnipeg Jets Top 10
72 t. näyttökertaa •
2 viikkoa sitten

2018 U18 Men's Worlds | Team USA Claims Silver

USA HOCKEY
21 t. näyttökertaa •
3 päivää sitten

Inspector Console Debugger Style Editor Performance Memory Network Storage

Search HTML

```

<link rel="search" type="application/opensearchdescription+xml" href="https://www.youtube.com/opensearch?locale=fi_FI" title="YouTube">
<link rel="manifest" href="/manifest.json">
<script>...</script>
<!--end of chunk-->
<script>...</script>
<ytd-app>
  <yt-activity-manager class="style-scope ytd-app"></yt-activity-manager>
  <yt-auth-manager class="style-scope ytd-app"></yt-auth-manager>
  <yt-app-context class="style-scope ytd-app">...</yt-app-context>
  <yt-gfeedback-manager class="style-scope ytd-app"></yt-gfeedback-manager>
  <yt-mdx-manager class="style-scope ytd-app"></yt-mdx-manager>
  <yt-navigation-manager id="nav" class="style-scope ytd-app"></yt-navigation-manager>

```

html > body > ytd-app

Rules Computed Layout Animations Fonts

Filter Styles

```

element {
}
ytd-app {
  --app-drawer-width: 240px;
  --app-drawer-content-container__background-color: var(--yt-main-app-background);
  background: var(--yt-main-app-background);
  display: block;
  left: 0;
  min-height: 100%;
  position: absolute;
  right: 0;
  top: 0;
}

```

I WANT IT



I WANT IT NOW

quickmeme.com



[NOTIFICATION](#)

[BUTTON](#)

[LAYOUT](#)

[IMAGE](#)

[CALENDAR](#)

Featured elements

[Browse elements](#)


dropdown

Polymer-based web component for a D2L dropdown

 BrightspaceUI

xtal-tree

Provide flat, virtual snapshot of a tree

 bahrus

web-socket

A Polymer 2.0 element to ease the usage of WebSockets.

 hunsalz

Featured collections

[Browse collections](#)

[vaadin-core](#)

[CatalystElements](#)

[granite-elements](#)

Vaadin Directory

Web UI components for everyone

Last updated

Highest rated

A-Z

Data Web Components



vaadin/vaadin-grid

by vaadin

vaadin-grid is a free, high quality data grid / data table element, built using Polymer



Updated 1 month ago



Miscellaneous Web Components



morbidick/paypal-express-checkout

by morbidick

Polymer 2 wrapper for the Paypal Express Checkout button



Updated 1 month ago



Themes Web Components



PolymerElements/app-layout

by PolymerElements

App layout elements



Updated 1 month ago



Data Web Components



PolymerElements/app-route

by PolymerElements

A modular client-side router



Themes Web Components



PolymerElements/paper-styles

by PolymerElements

Shared styles for Material Design elements



UI Web Components



vaadin/vaadin-date-picker

by vaadin

vaadin-date-picker is a free Web Component providing a date selection field with scrollable mon...



vaadin/vaadin-date-picker



1

1 month ago

[See online demo](#)



by vaadin

vaadin-date-picker is a free Web Component providing a date selection field with scrollable month calendar. Built using Polymer

Overview

Reviews (1)

Related Links

Install

COMPONENT VERSION

Version v3.0.0-alpha5

Imported

Released 12 January 2018

[Apache License 2.0](#)

INSTALL WITH

Bower

Use exact version (3.0.0-alpha5)

```
bower install --save vaadin/vaadin-date-picker#3.0.0-alpha5
```

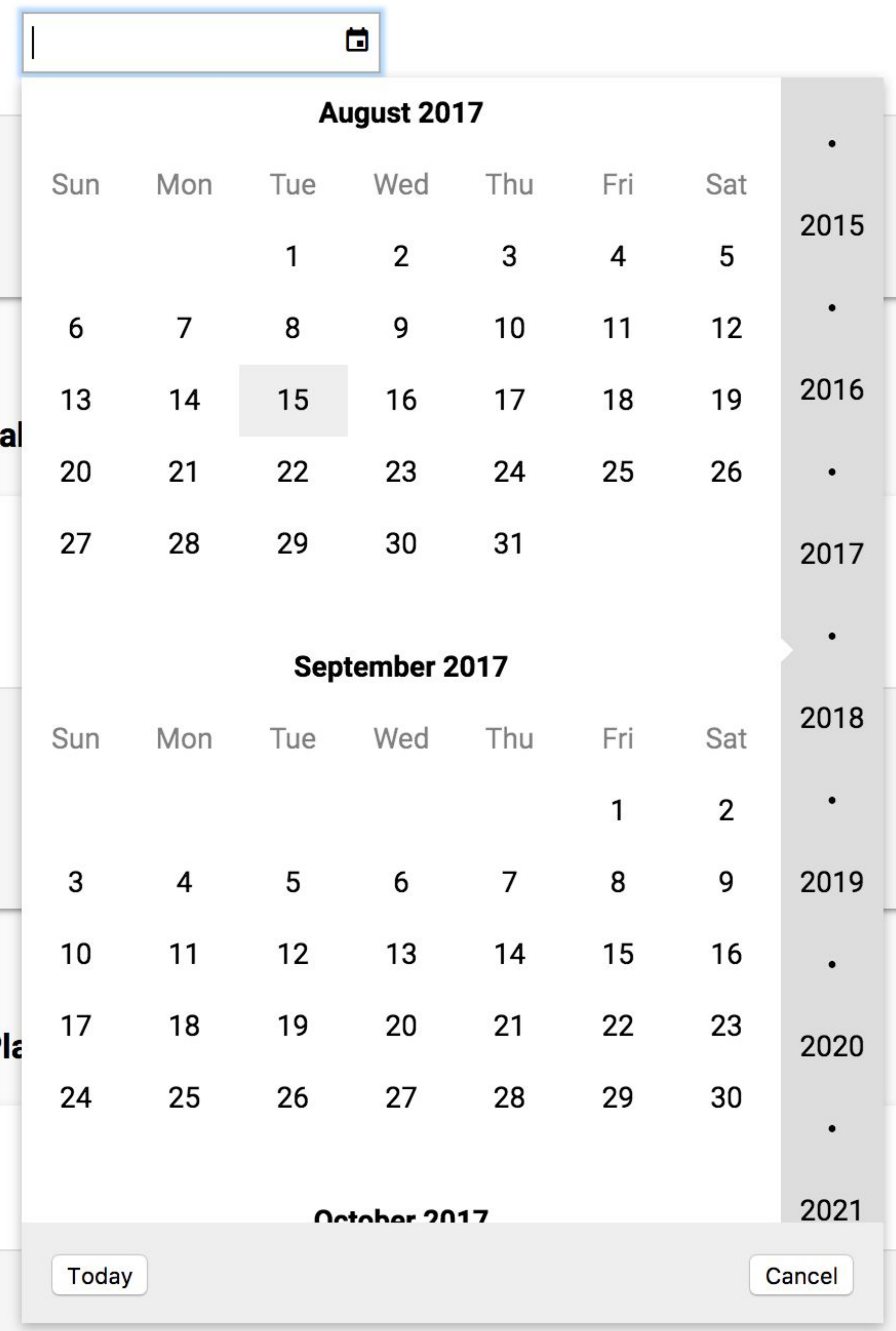
Run the above Bower command in your project

- Install an element

```
bower install --save vaadin/vaadin-date-picker
```

- Import an element

```
<link rel="import"  
href="bower_components/vaadin-date-picker/vaadin-date-picker.html">
```



```
<vaadin-date-picker>  
</vaadin-date-picker>
```

Vaadin Web Components


	Email	Name
<input type="checkbox"/>	kaycee.thompson@price.name	Louisa Brady
<input checked="" type="checkbox"/>	steuber_nathanael@hotmail.com	Luke Waters
<input type="checkbox"/>	sipes_connor@gmail.com	Francisco Saunders
<input checked="" type="checkbox"/>	cullen_lang@elinor.io	Albert Walsh
<input checked="" type="checkbox"/>	jakubowski_schuyler@yahoo.com	Jeff Bryant
<input type="checkbox"/>	schmeler.delbert@maci.me	Derrick Stevenson
<input type="checkbox"/>	lehner.raina@hotmail.com	Hester Townsend
<input type="checkbox"/>	maeve.powlowski@louie.info	Seth Fitzgerald
<input type="checkbox"/>	braulio.thiel@yahoo.com	Jack Walsh
<input type="checkbox"/>	carmel_ward@mayert.com	Mildred Morgan
<input type="checkbox"/>	buster.maggio@hotmail.com	Francis Hoffman


Grid


c|

New

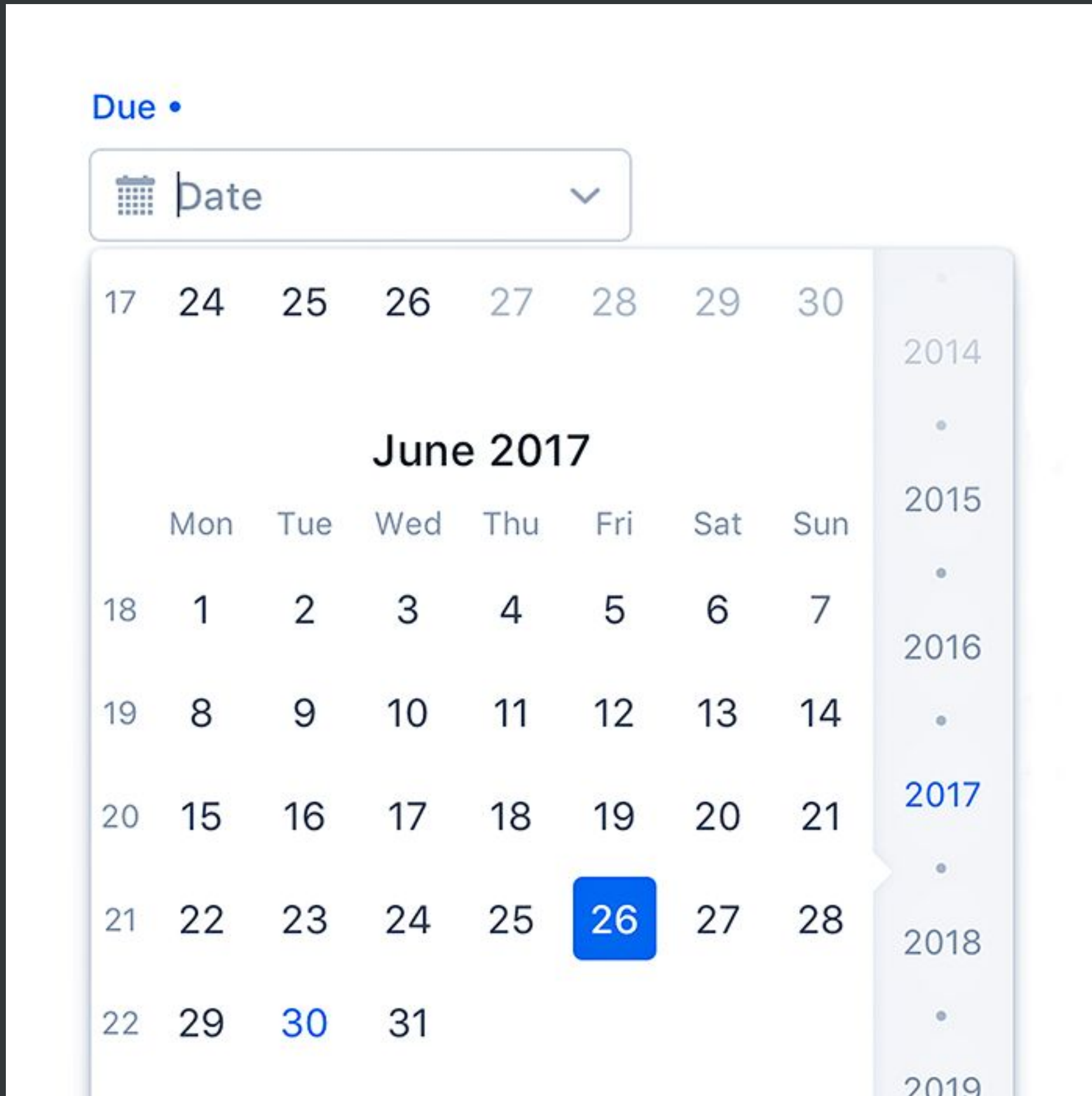
Confirmed

 Caroly Christensen

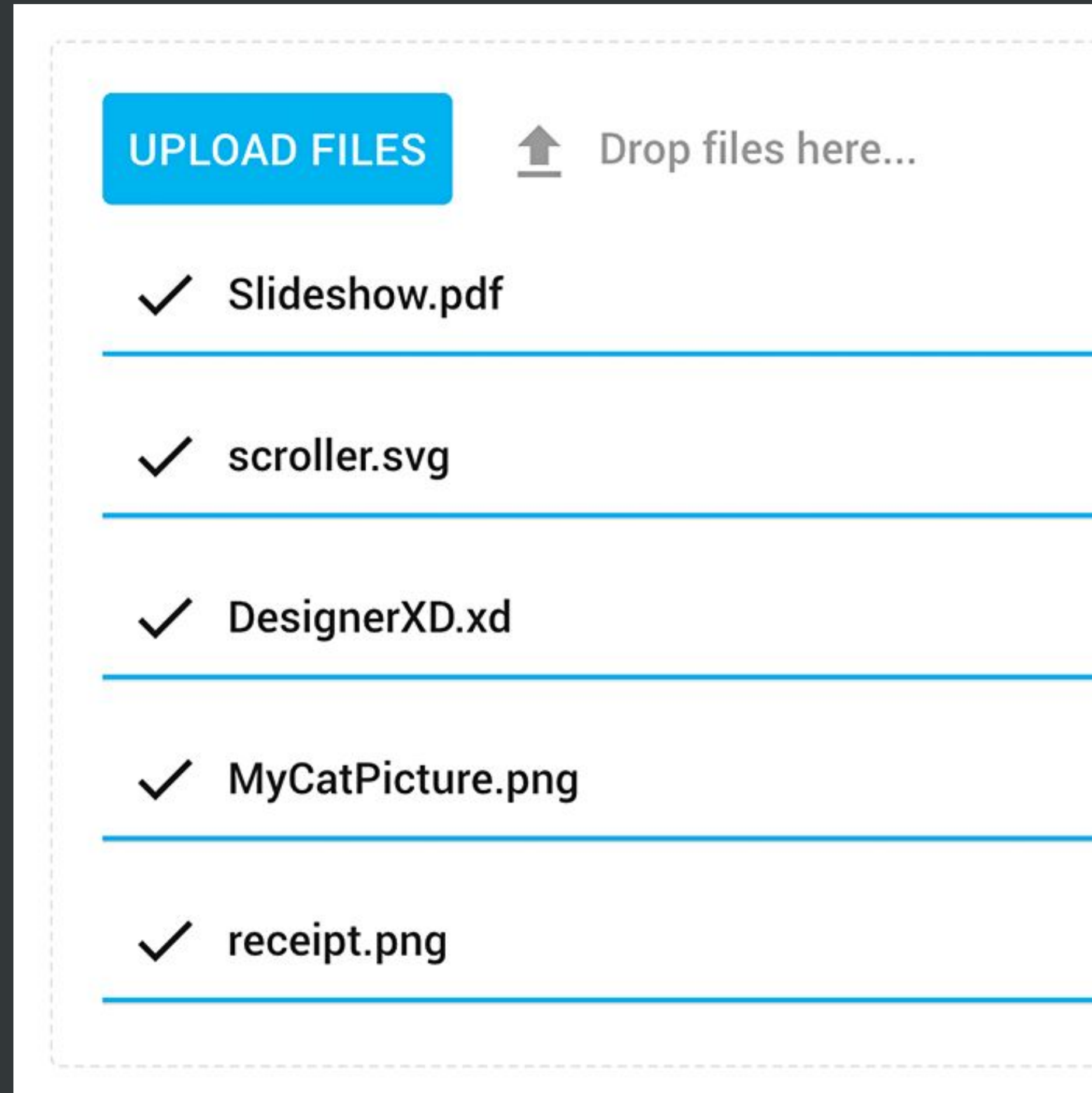
 Cody Swanson

 Nicholas Wilkerson

Combo Box



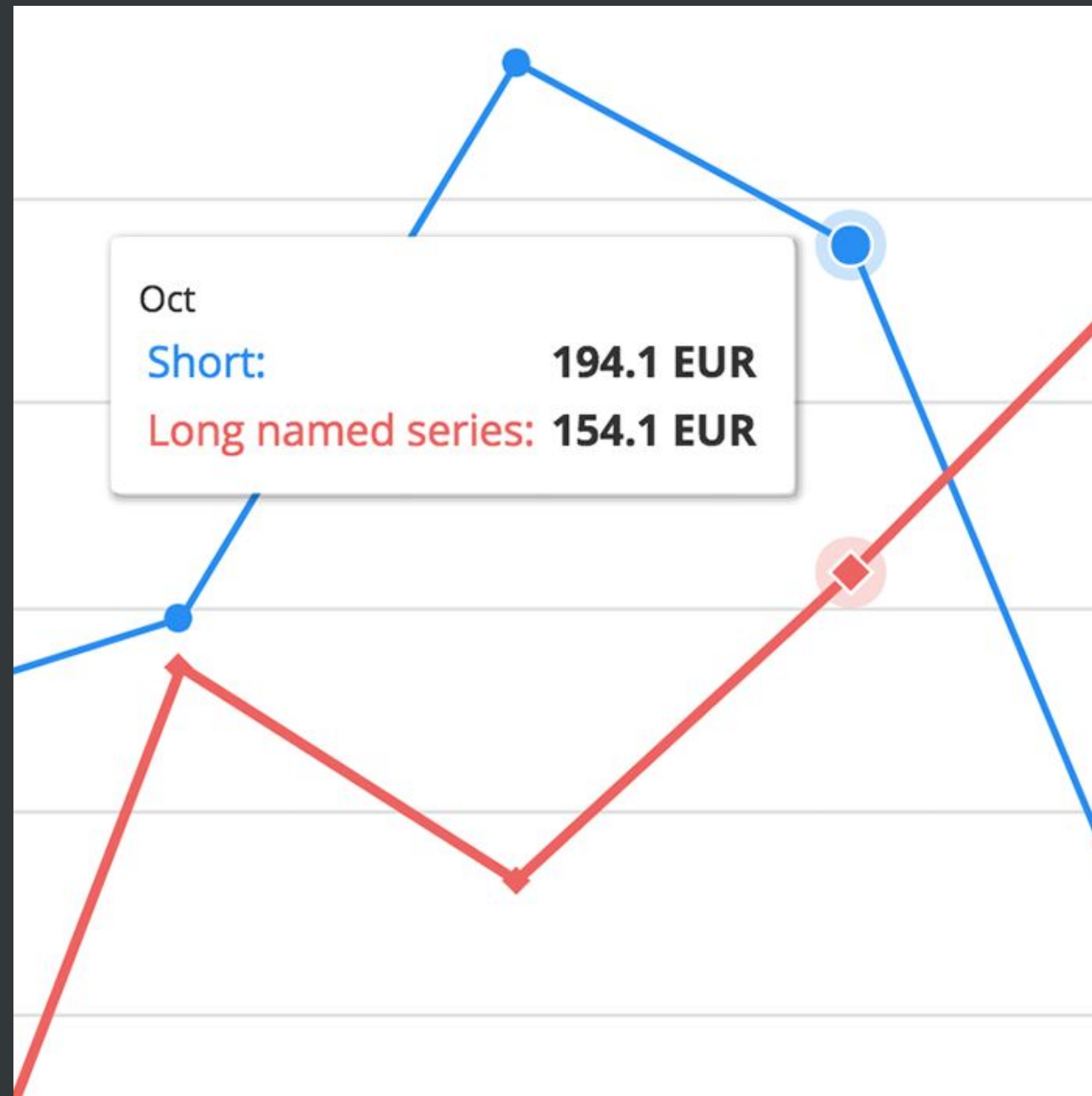
Date Picker



Upload

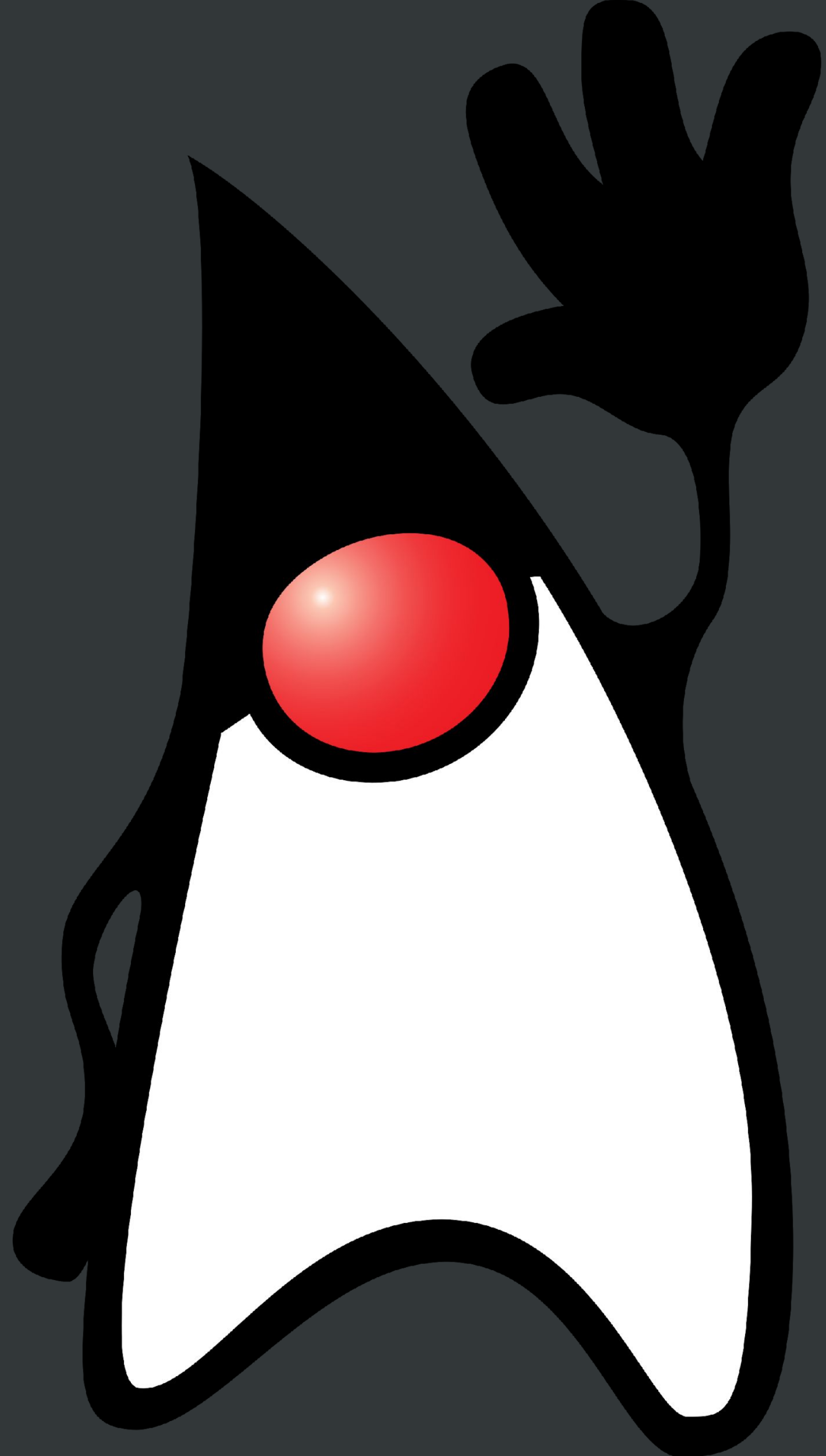
B3		MONTHLY INCOME		
A	B	C	D	
1	SIMPLE MONTHLY B			
2				
3	MONTHLY INCOME			
4	<i>Item</i>			<i>Amount</i>
5	Ash			\$1,000.00
6	Jamie			\$1,000.00
7	Dividends			\$250.00
8				
9	MONTHLY EXPENSES			
10	<i>Item</i>			<i>Amount</i>
11	Rent/mortgage			\$800.00

Spread Sheet



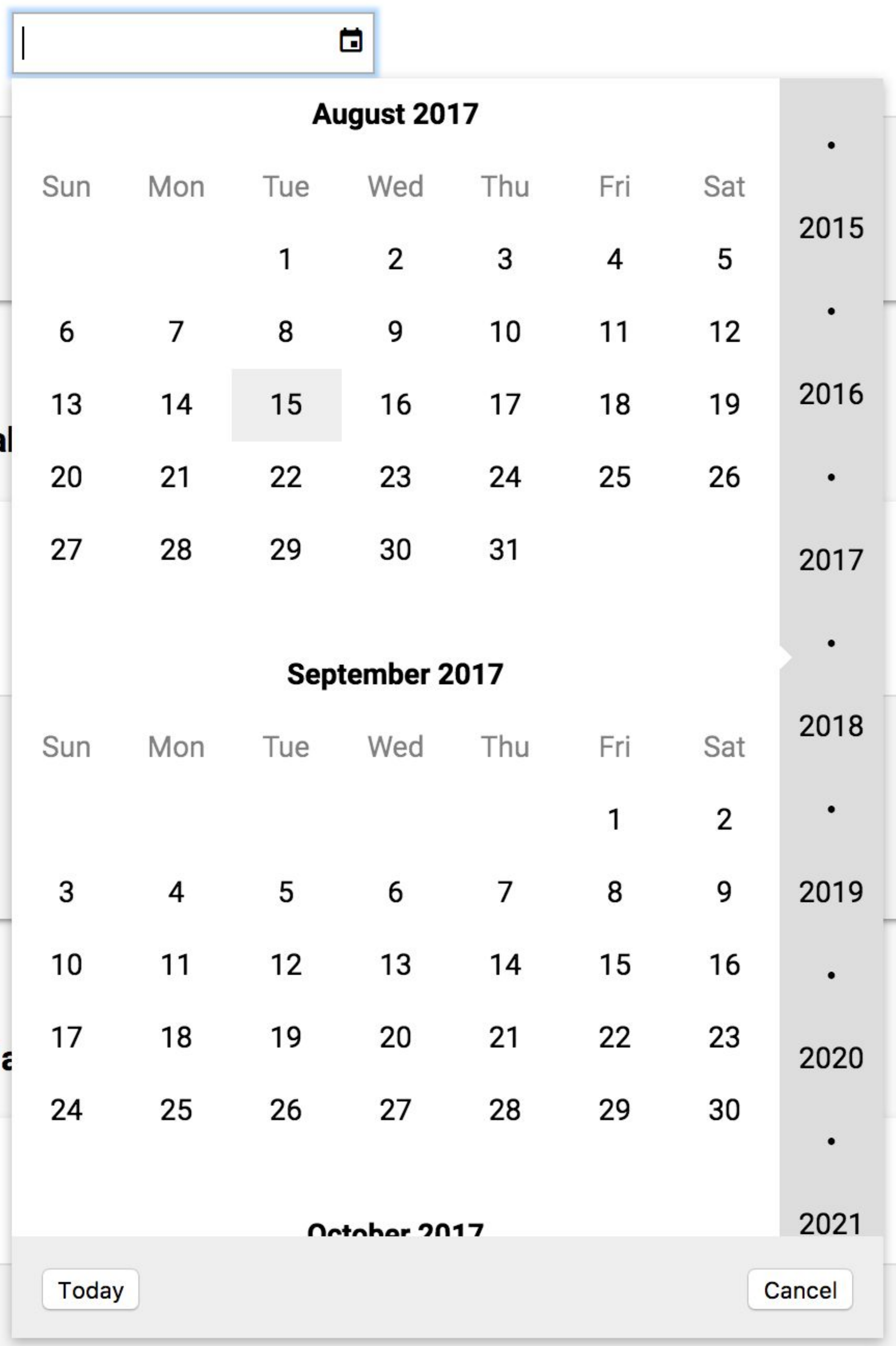
Charts

And Many More ...



What about me?

Server-side Component APIs



```
public class MainView extends VerticalLayout {
```

```
    public MainView() {  
        add(new DatePicker());  
    }  
}
```

vpusher/game-card

[See online demo](#)



1

5 months ago



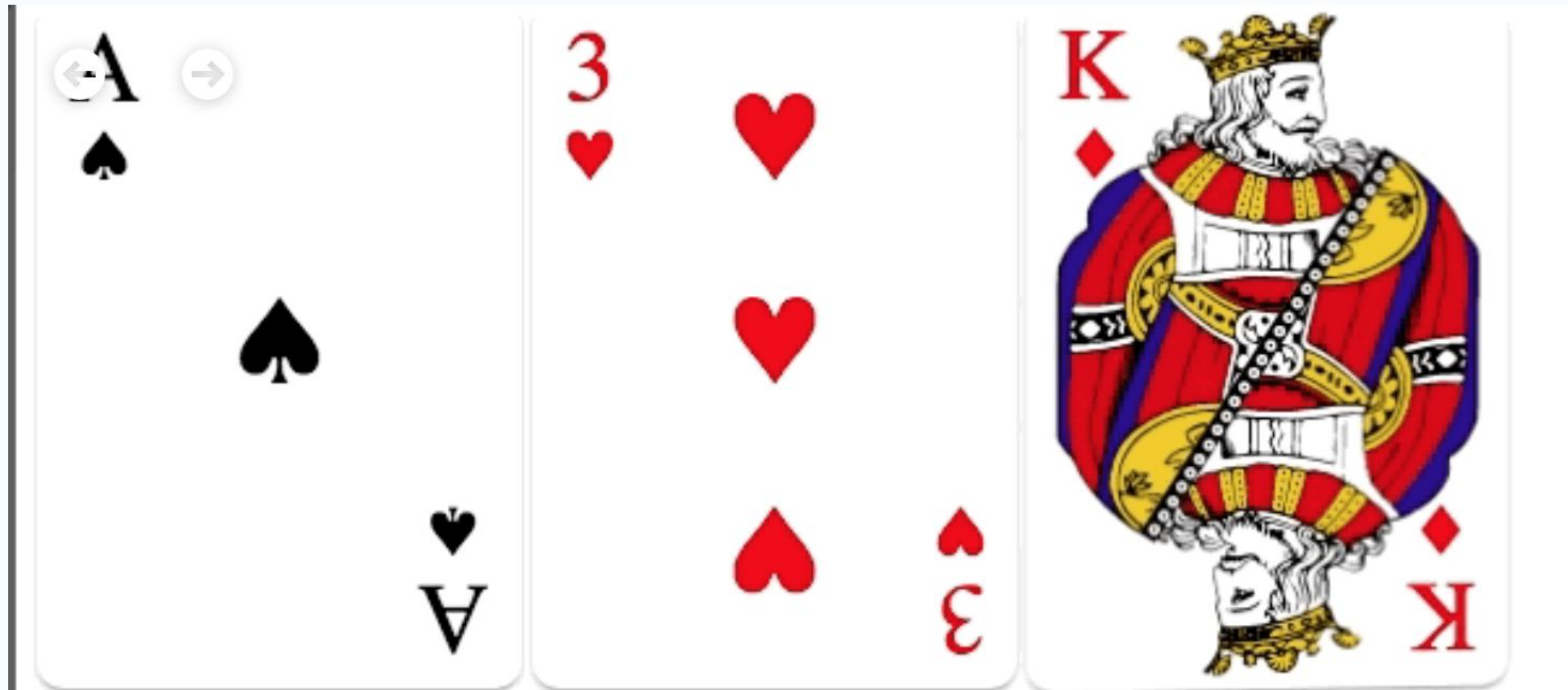
by vpusher

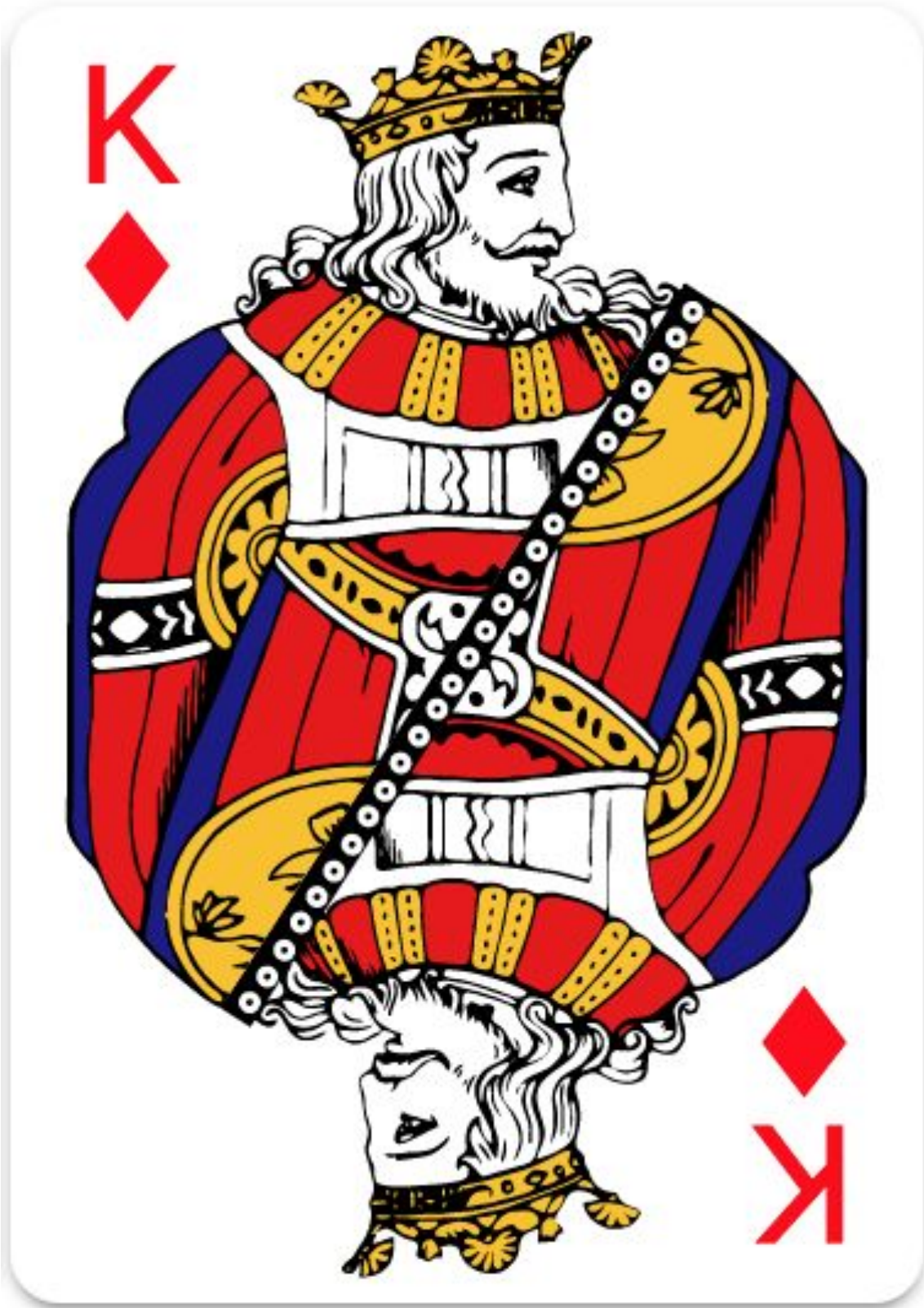
playing game card element based on ES6 and Polymer 2.0

Overview

Reviews (1)

Related Links



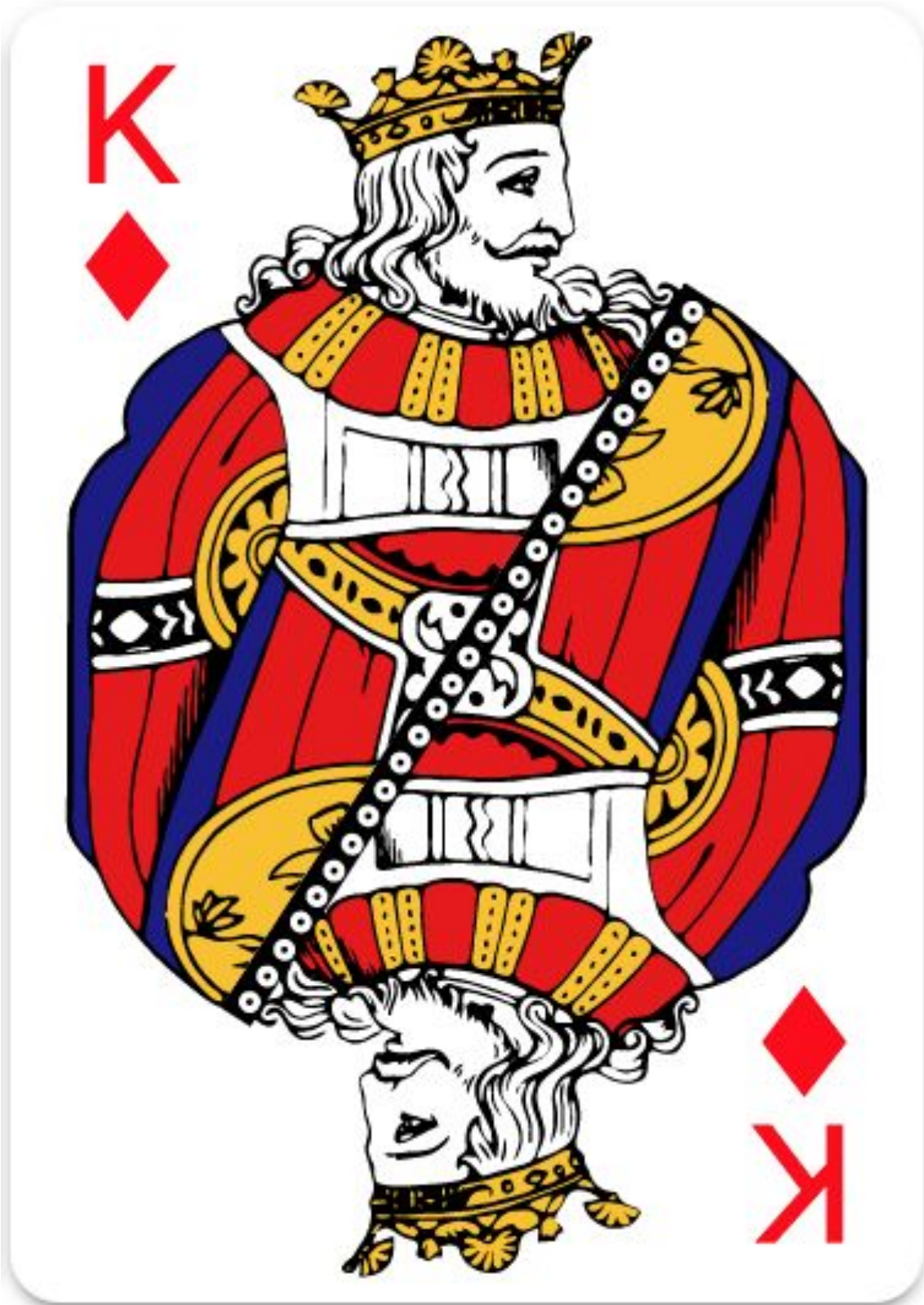


```
<game-card  
  symbol="♦"  
  rank="k">  
</game-card>
```




WebJar:

Client-side web library packaged into JAR

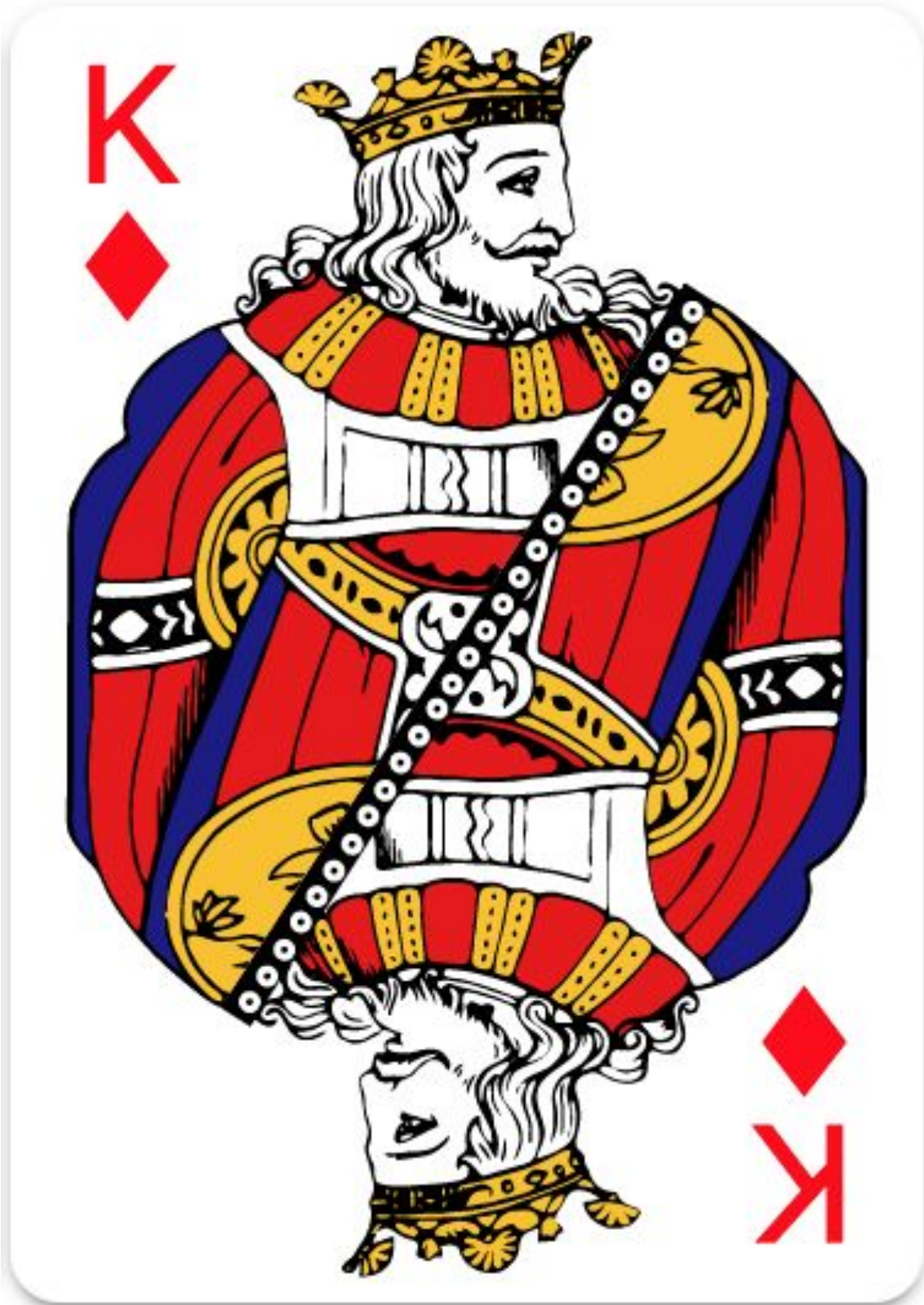


```
<dependency>  
  <groupId>org.webjars.bower</groupId>  
  <artifactId>github-com-vpusher-game-card</artifactId>  
  <version>1.0.6</version>  
</dependency>
```

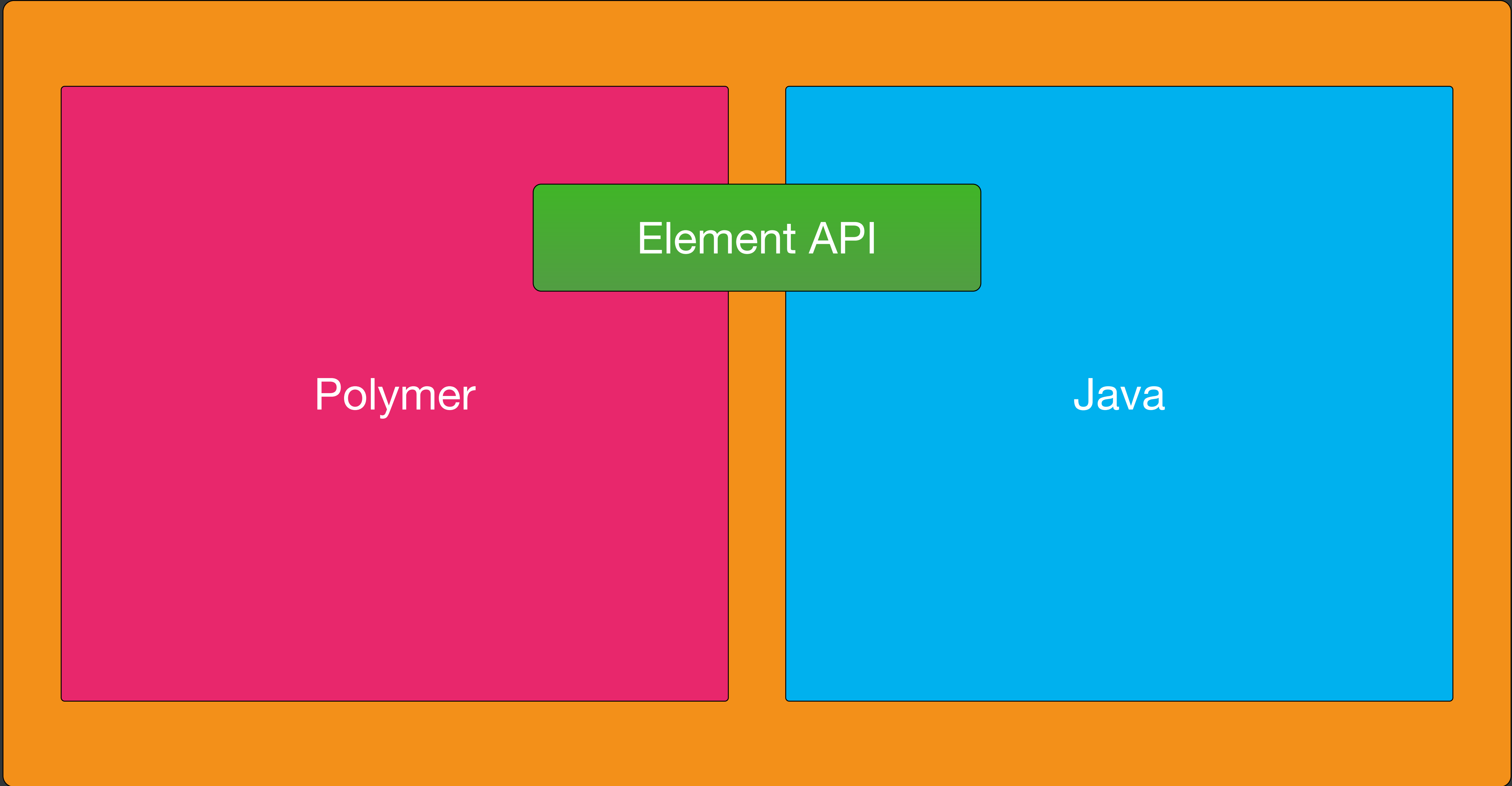
Flow

Web components (HTML)

Component (Java)



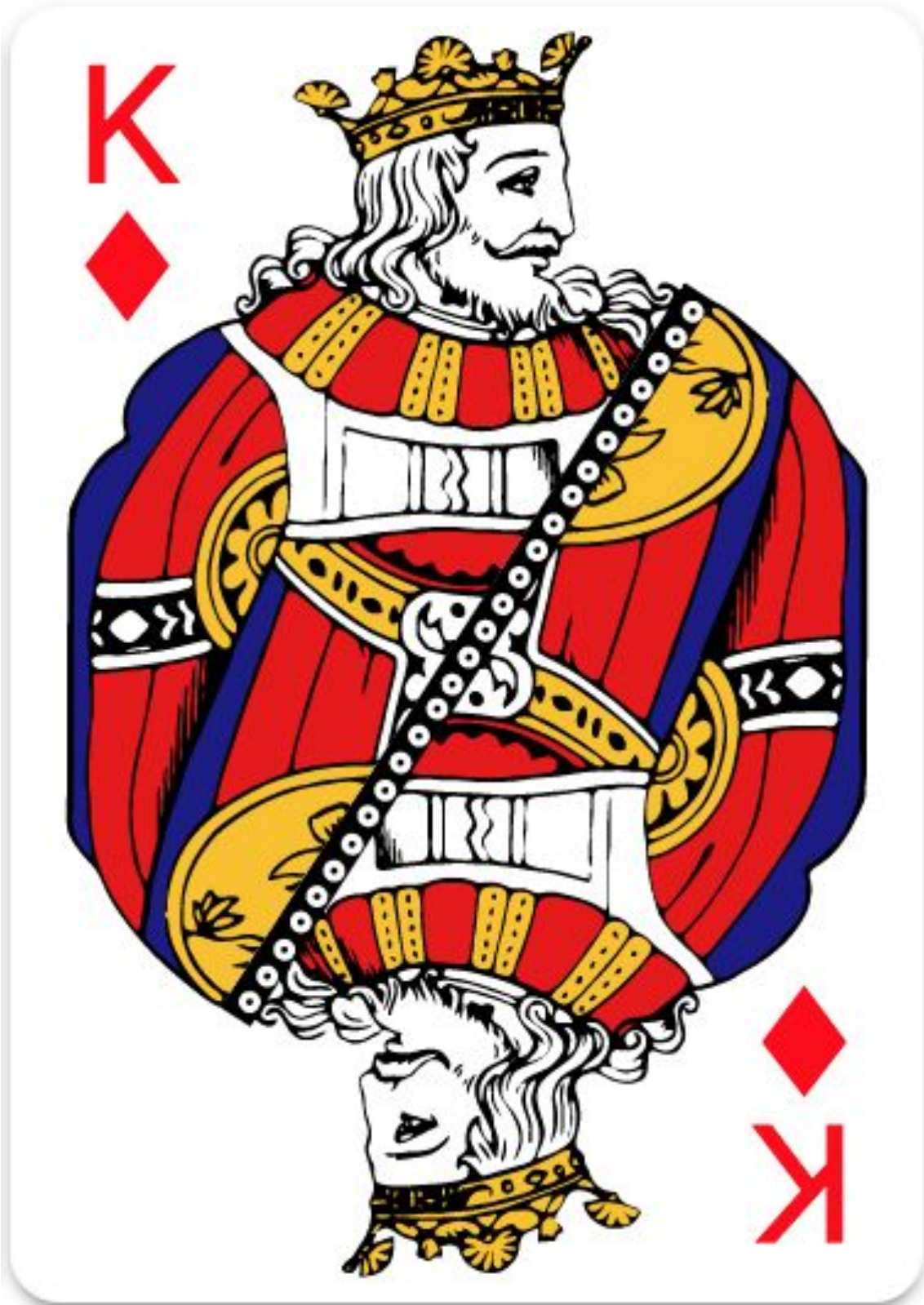
```
@Tag("game-card")  
@HtmlImport("bower_components/game-card/game-card.html")  
public class GameCardTemplate extends Component{  
}
```



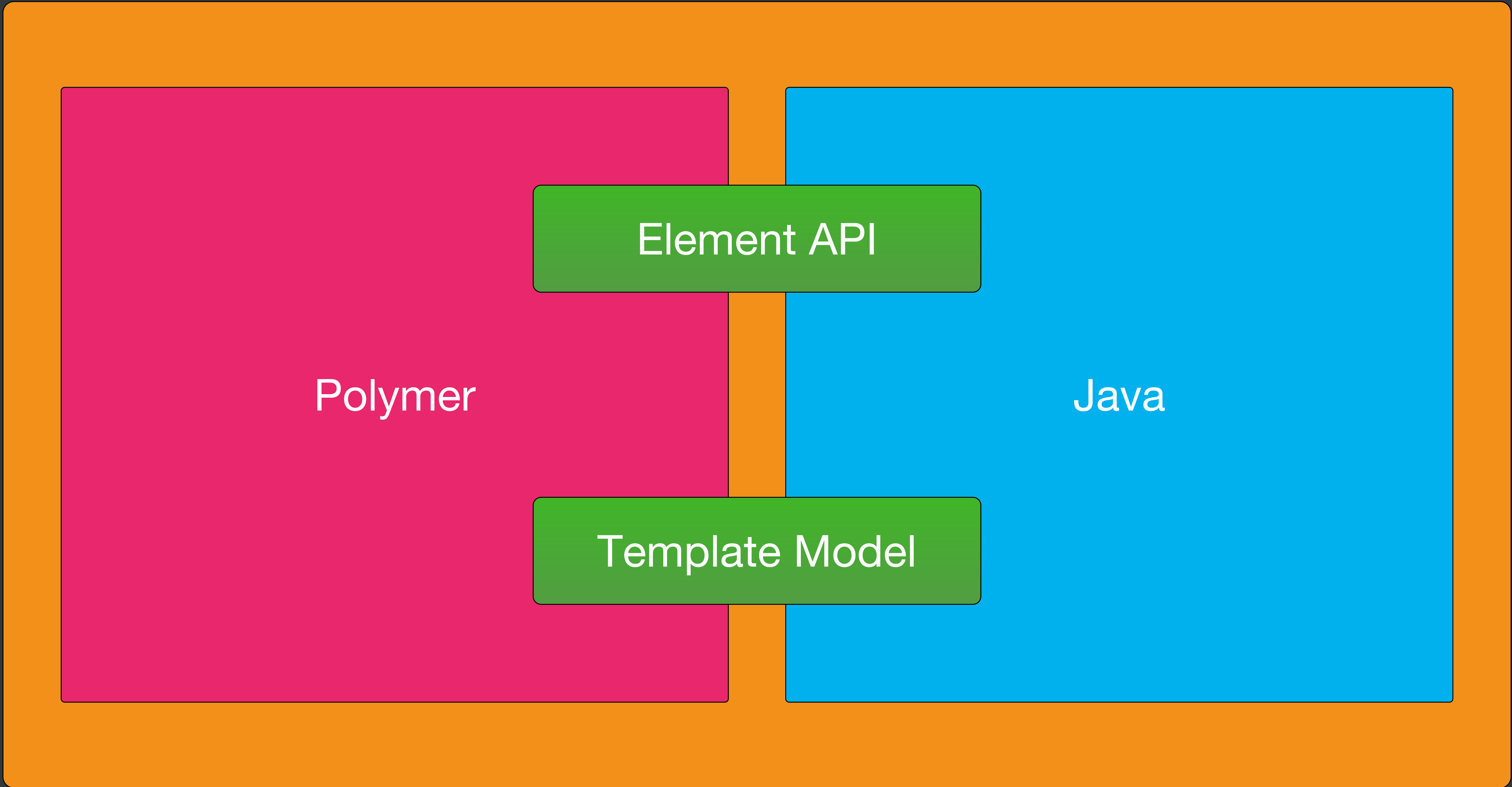
Element API

Polymer

Java



```
public MainView() {  
    GameCardTemplate gameCard = new GameCardTemplate();  
    gameCard.getElement().setAttribute("symbol", "♦");  
    gameCard.getElement().setAttribute("rank", "k");  
    add(gameCard);  
}
```




```
<game-card  
  symbol="[[symbol]]"  
  rank="[[rank]]">  
</game-card>
```

```
@Tag("game-card")  
@HtmlImport("bower_components/game-card/game-card.html")  
public class GameCardTemplate extends  
    PolymerTemplate<GameCardModel>{  
    public GameCardTemplate(){  
        getModel().setRank("k");  
        getModel().setSymbol("♦");  
    }  
}  
  
public interface GameCardModel extends TemplateModel {  
    void setSymbol(String symbol);  
    String getSymbol();  
  
    void setRank(String rank);  
    String getRank();  
}
```

Component APIs



Flow

Vaadin Web Components



Make My Own Template?



```
<hello-world></hello-world>
```

Hello World!

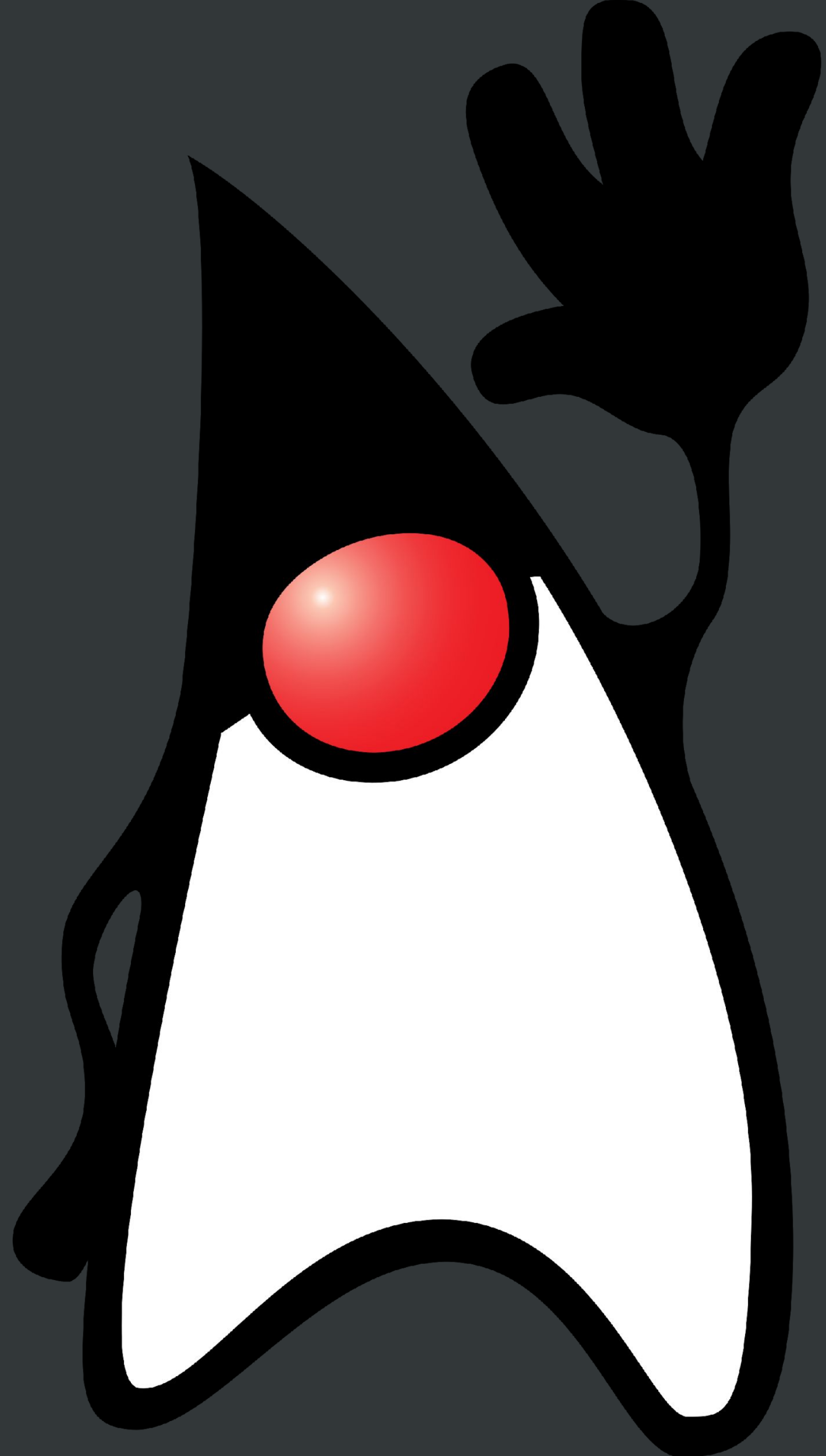
Native Approach

```
<template id="template1">
  Hello world!
</template>
<script>
  customElements.define('hello-world', class extends HTMLElement {
    constructor() {
      super();
      let shadowRoot = this.attachShadow({mode: 'open'});
      const t = document.querySelector('#template1');
      const instance = t.content.cloneNode(true);
      shadowRoot.appendChild(instance);
    }
  });
</script>
```



Polymer

```
<dom-module id="hello-world">
  <template>
    Hello world!
  </template>
  <script>
    class HelloWorld extends Polymer.Element{
      static get is() { return 'hello-world'; }
    }
    customElements.define(HelloWorld.is, HelloWorld);
  </script>
</dom-module>
```



What about me?



FIGHT FOR SIMPLICITY

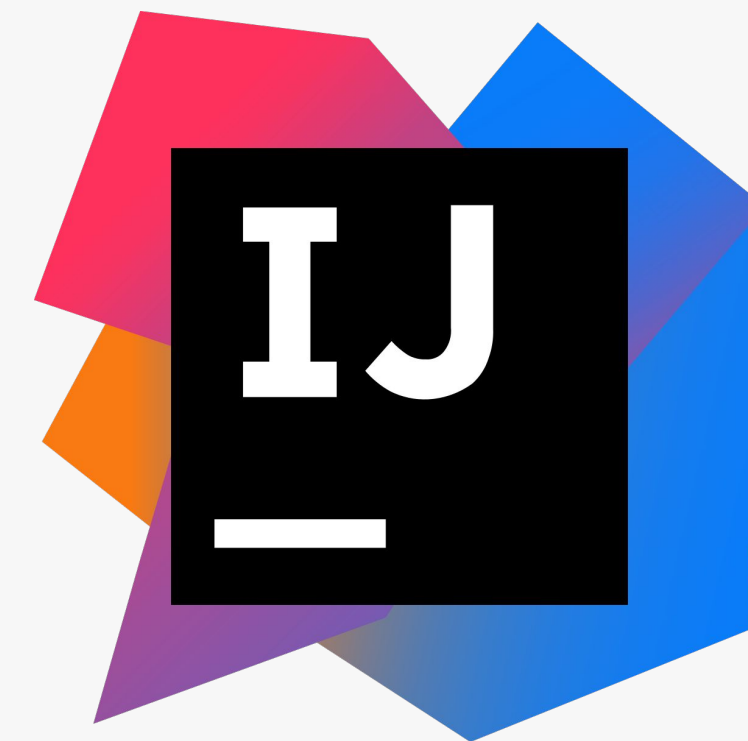
In end-user experience and
developer experience.



VAADIN DESIGNER

THE DRAG DROP VISUAL DESIGNER FOR VAADIN FRAMEWORK

Designer is an IDE **plugin**



New

Open...

Open Recent

Close Project

Project Structure...

Other Settings

Import Settings...

Export Settings...

Export to Eclipse...

Settings Repository...

Save All

Synchronize

Invalidate Caches / Restart...

Export to HTML...

Print...

Add to Favorites

File Encoding

Line Separators

Make Directory Read-only

Power Save Mode

Project...

Project from Existing Sources...

Project from Version Control

Module...

Module from Existing Sources...

File

Scratch File

Directory

FXML File

HTML File

Concept

Specification

XSLT Stylesheet

Edit File Templates...

Resource Bundle

Vaadin 8 Design

Flow template

New Flow Template

Template location:

teCustomElements/Exercises/Solutions/src/main/webapp/frontend

Create Java companion file:

Java source root:

/Users/haijian/Documents/training/online-courses-java/Vaadin10/...

Java package:

com.vaadin.training.customelement

Name:

hello-world

Cancel

OK

Viewport (780 x 638)



Drop elements here to start

Palette

Search

▼ Project Templates

▼ Web Components

- iron-a11y-announcer
- iron-flex-layout
- iron-icon
- iron-list
- iron-overlay-behavior
- polymer
- vaadin-button
- vaadin-checkbox
- vaadin-combo-box
- vaadin-date-picker
- vaadin-dialog
- vaadin-form-layout
- vaadin-grid
- vaadin-item
- vaadin-list-box
- vaadin-notification
- vaadin-ordered-layout
- vaadin-overlay
- vaadin-progress-bar
- vaadin-radio-button
- vaadin-split-layout
- vaadin-tabs
- vaadin-text-field
- vaadin-upload

▼ HTML Elements

- a
- button
- div

Outline

Element

hello-world

Name

Nothing to show

Hello World

Palette

HTML Elements

- h1

Outline

Element	
hello-world	
h1	
text	

Name	
content	Hello World



Viewport (767 x 960)



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

```
<link rel="import" href="../../../../../../Stubs/src/main/webapp/frontend/bower_com  
<dom-module id="hello-world">  
  <template>  
<h1>Hello World</h1>  
</template>  
  
  <script>  
    class HelloWorld extends Polymer.Element {  
      static get is() {  
        return 'hello-world';  
      }  
    }  
    customElements.define(HelloWorld.is, HelloWorld);  
  </script>  
</dom-module>
```




Viewport (767 x 960)



Hello World

Hello World

```
<!DOCTYPE html>  
...<html class="gr__localhost"> == $0  
  ▶ <head>...</head>  
  ▼ <body data-gr-c-s-loaded="true">  
    ▼ <hello-world>  
      ▶ #shadow-root (open)  
      </hello-world>  
    </body>  
</html>
```

Outline

<http://localhost:59119/flow/6a78>

Use this link to view the design in your browser of choice.

Only allow browsers on this computer.

New Flow Template

Template location:

teCustomElements/Exercises/Solutions/src/main/webapp/frontend

Create Java companion file:

Java source root:

/Users/haijian/Documents/training/online-courses-java/Vaadin10/...

Java package:

com.vaadin.training.customelement

Name:

hello-world

Cancel

OK

```
@Tag("hello-world")
@HtmlImport("frontend://Intro/Exercises/Solutions/hello-world.html")
public class HelloWorld extends PolymerTemplate<HelloWorld.HelloWorldModel> {

    public interface HelloWorldModel extends TemplateModel {

    }
}
```

Say Hello

Palette

🔍 butto

- ▼ Project Designs
 - buttons-bar
 - buttons-bar
 - buttons-bar
 - buttons-bar
 - buttons-bar
 - form-buttons-bar
 - form-buttons-bar
 - form-buttons-bar
 - form-buttons-bar
 - form-buttons-bar
- ▼ Web Components
 - vaadin-button
 - vaadin-radio-button
- ▼ HTML Elements
 - button

Element

- ▼ hello-world
 - ▼ vaadin-button
 - text

Name	Value
content	Say Hello

▼ hello-world

▼ vaadin-button



text

Name	Value
autofocus	<input type="checkbox"/>
class	
disabled	<input type="checkbox"/>
id	helloButton
style	

```
@Tag("hello-world")
@HtmlImport("frontend://hello-world.html")
public class HelloWorld extends PolymerTemplate<HelloWorld.HelloWorldModel> {

    @Id("helloButton")
    private Button helloButton;

    public interface HelloWorldModel extends TemplateModel {

    }
}
```

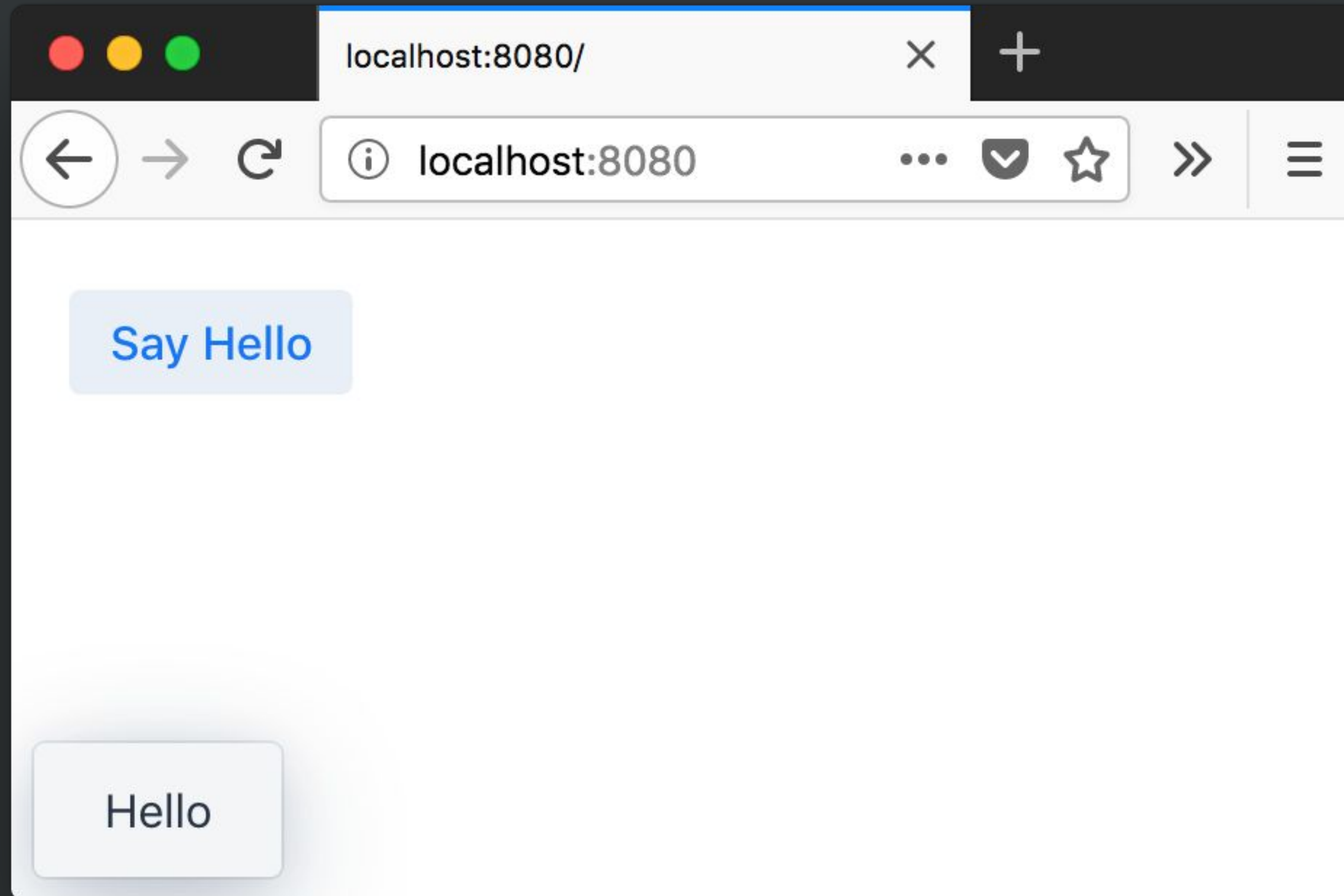
```
@Tag("hello-world")
@HtmlImport("frontend://hello-world.html")
public class HelloWorld extends PolymerTemplate<HelloWorld.HelloWorldModel> {

    @Id("helloButton")
    private Button helloButton;

    public HelloWorld(){
        helloButton.addClickListener(e->{
            Notification.show("Hello");
        });
    }

    public interface HelloWorldModel extends TemplateModel {

    }
}
```

Vaadin 10

Server-side Component APIs

Flow

Client-side Vaadin Web Components

Designer