

# Shedding Light on the Shadow DOM

# ABOUT ME

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```

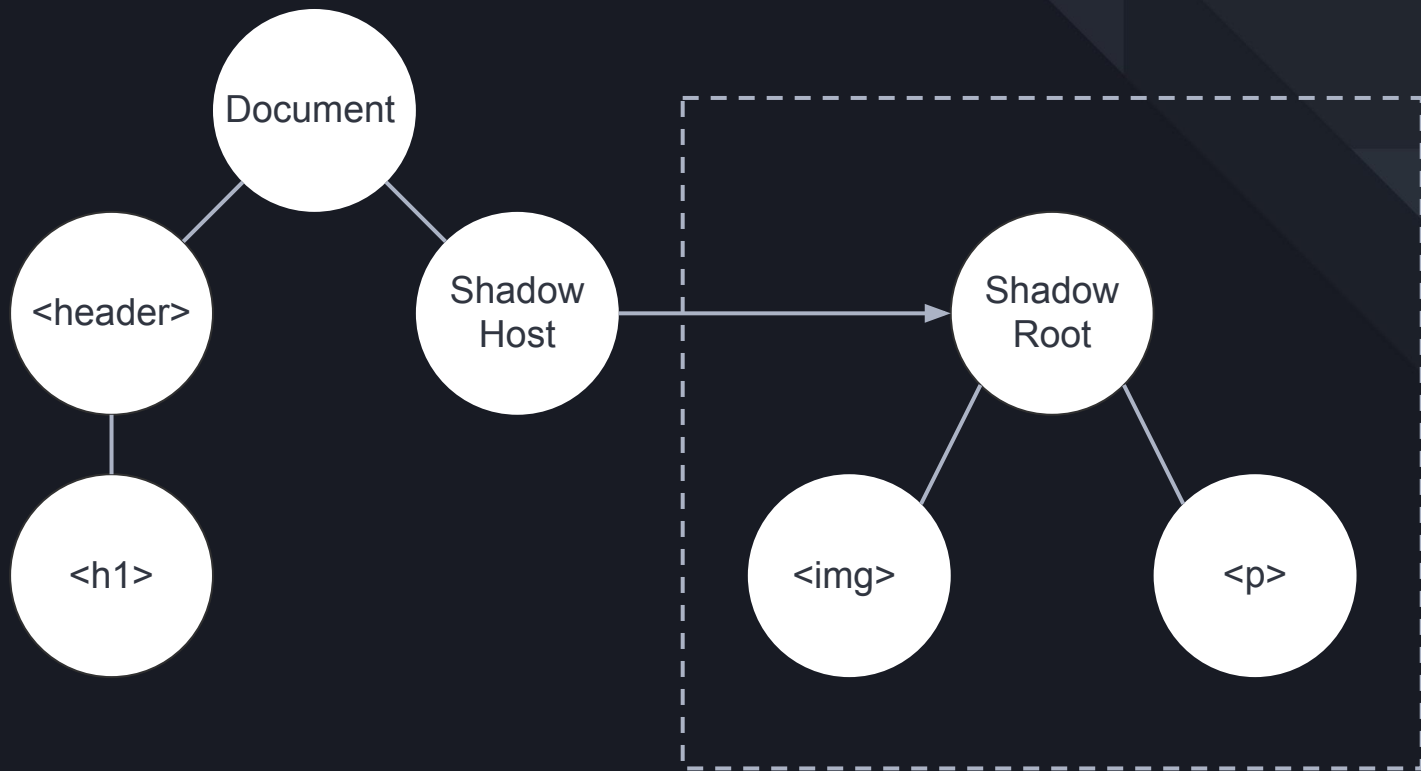


# What is the Shadow DOM?

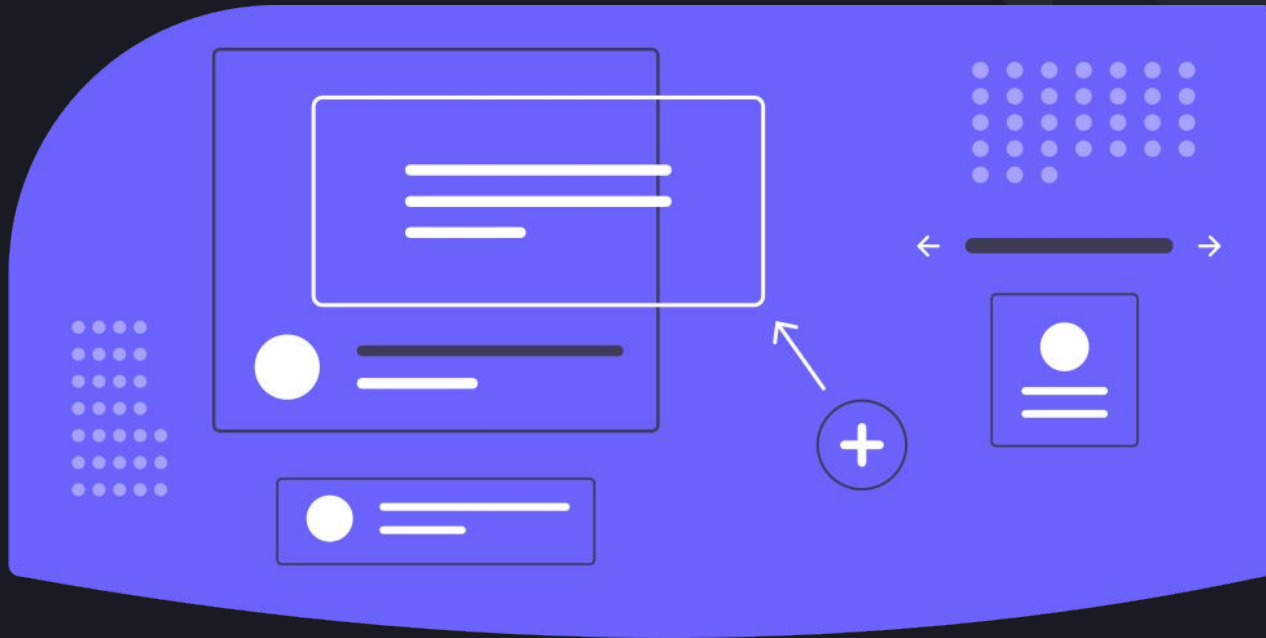
**Shadow DOM** is an API built into the browser that allows for **DOM encapsulation** and **style encapsulation**.

Shadow DOM = Encapsulation

# Shadow DOM



# Design Systems



# Web Components with Stencil

```
@Component({  
  tag: 'my-component',  
  styleUrl: 'my-component.css',  
  shadow: true,  
})  
export class MyComponent {  
  render() {  
    return (  
      <Host>  
        <slot></slot>  
      </Host>  
    );  
  }  
}
```



# Let's Build a Component!

## Card Heading

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## shadow-card.tsx

```
@Component({
  tag: 'shadow-card',
  styleUrl: 'shadow-card.css',
})
export class ShadowCard {
  @Prop() heading: string;

  render() {
    return (
      <Host>
        <h1>{this.heading}</h1>
        <slot></slot>
      </Host>
    );
  }
}
```

## shadow-card.css

```
:host {
  display: block;
  width: 300px;
  border: 1px solid black;
  border-radius: 8px;
  padding: 16px;
}
```



## Card Heading

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```
<shadow-card heading="Card Heading">Lorem ipsum ...</shadow-card>
```

# index.html

```
<body>

  <style>
    h1 {
      color: blue;
    }
  </style>

  <h1>Page Heading</h1>
  <shadow-card heading="Card Heading">
    Lorem ipsum ...
  </shadow-card>

</body>
```

## Page Heading

### Card Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

## shadow-card.tsx

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  tag: 'shadow-card',
  styleUrl: 'shadow-card.css',
  shadow: true,
})
export class ShadowCard {
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  render() {
    return (
      <Host>
        <h1>{this.heading}</h1>
        <slot></slot>
      </Host>
    );
  }
}
```

## Page Heading

### Card Heading

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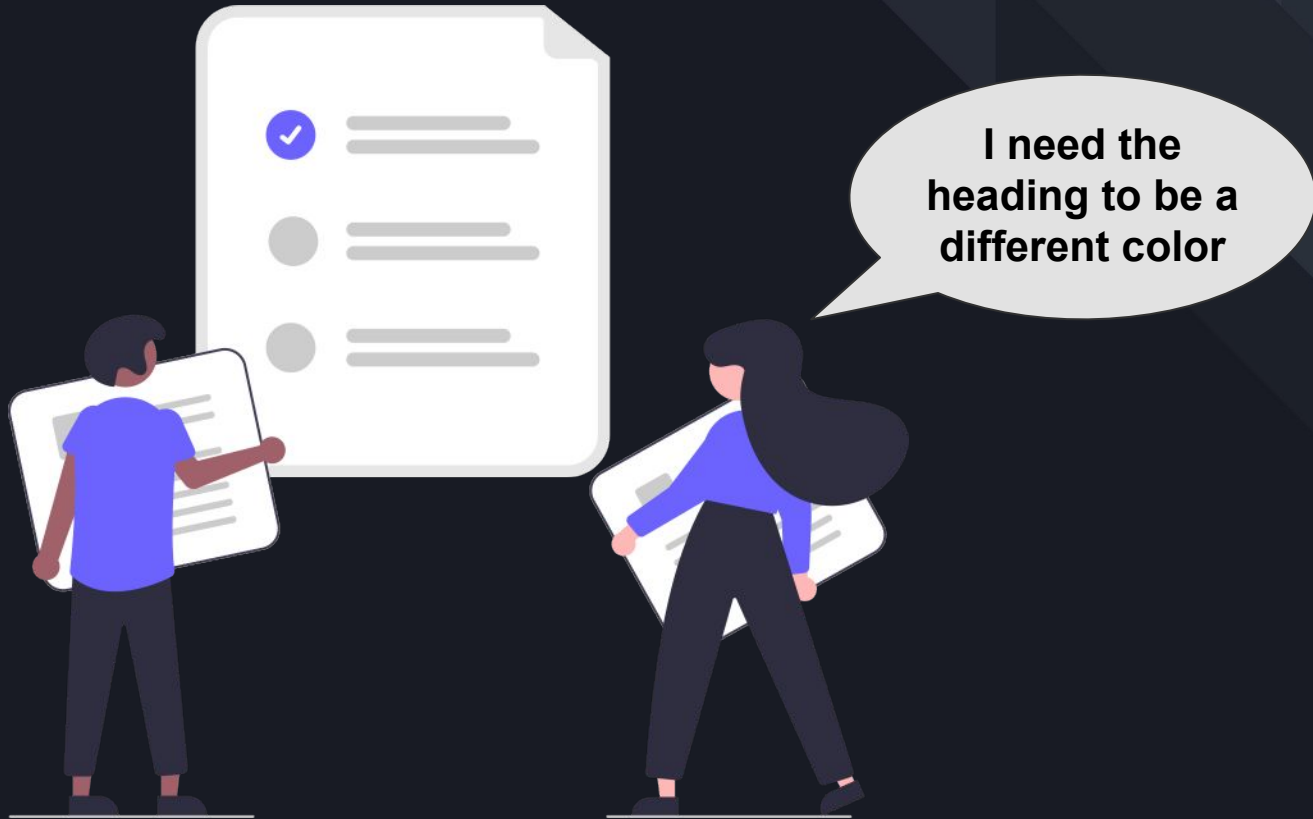
```

▼ <body>
  <style>body { padding: 32px; } h1 { color: blue; }</style>
  <h1>Page Heading</h1>
... ▼ <shadow-card heading="Card Heading" class="hydrated" data-hmr="440577053
960"> == $0
  ▼ #shadow-root (open)
    ▶ <style sty-id="sc-shadow-card">...</style>
      <h1>Card Heading</h1>
      ▼ <slot>
        ↳ #text reveal
      </slot>
      "Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do
      eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad
      minim veniam, quis nostrud exercitation ullamco laboris nisi ut
      aliquip ex ea commodo consequat. Duis aute irure dolor in
      reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
      pariatur. Excepteur sint occaecat cupidatat non proident, sunt in
      culpa qui officia deserunt mollit anim id est laborum."
    </shadow-card>

```



# Not Quite



**We need to adjust our mental model**





# Custom styling with CSS custom properties

```
shadow
:host {
  display: block;
  width: 300px;
  border: 1px solid black;
  border-radius: 8px;
  padding: 16px;

  --heading-color: blue;

}

h1 {
  color: var(--heading-color);
}
```

## Page Heading

### Card Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

index.html

e;

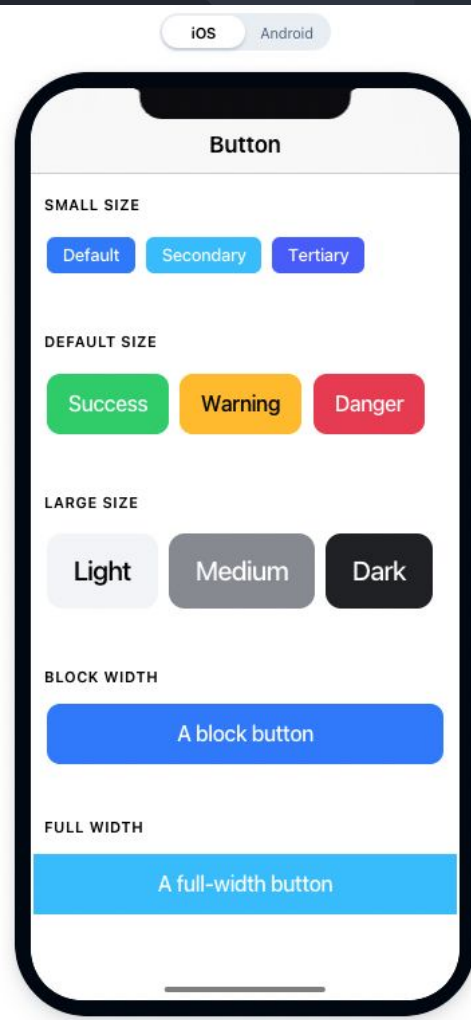
```
{
  color: red;
}
```

```
ng</h1>
heading="Card Heading">
..
```



# CSS Custom Properties

Name	Description
<code>--background</code>	Background of the button
<code>--background-activated</code>	Background of the button when pressed. Note: setting this will interfere with the Material Design ripple.
<code>--background-activated-opacity</code>	Opacity of the button when pressed
<code>--background-focused</code>	Background of the button when focused with the tab key
<code>--background-focused-opacity</code>	Opacity of the button when focused with the tab key
<code>--background-hover</code>	Background of the button on hover
<code>--background-hover-opacity</code>	Opacity of the background on hover
<code>--border-color</code>	Border color of the button
<code>--border-radius</code>	Border radius of the button
<code>--border-style</code>	Border style of the button
<code>--border-width</code>	Border width of the button



# CSS ::part()

index.html

shadow

```
export class ShadowCard {
  @Prop() heading: string;

  render() {
    return (
      <Host>
        <h1 part="heading" >
          <slot></slot>
        </Host>
      </Host>
    );
  }
}
```

## Page Heading

### CARD HEADING

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

```
: blue;
```

```
card {
  heading-color: red;
```

```
card::part(heading) {
  transform: uppercase;
```

# Let's add another component

shadow-button.tsx



```
export class ShadowButton {  
  render() {  
    return (  
      <button>  
        <slot></slot>  
      </button>  
    );  
  }  
}
```

# Shared Styles

global.css

```
:root {  
  --color-primary: green;  
  
  /* fonts, colors, sizes, etc */  
}
```

stencil.config.ts

```
export const config: Config = {  
  namespace: 'shadow-dom',  
  globalStyle: "src/global/global.css",  
  ...  
};
```

## shadow-button.css

```
button {  
  background-color: var(--color-primary);  
}
```



## shadow-card.css

```
h1 {  
  color: var(--color-primary);  
}
```

### Card Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

# Shadow DOM and Forms

We need some workarounds to get our shadow DOM components to behave well in forms

```
export class ShadowButton {
  @Element() el: HTMLElement;

  @Prop() type: string;

  private handleClick = (ev: Event) => {
    if (this.type === 'submit') {
      const form = this.el.closest('form');
      if (form) {
        ev.preventDefault();
        const fakeButton = document.createElement('button');
        fakeButton.type = this.type;
        fakeButton.style.display = 'none';
        form.appendChild(fakeButton);
        fakeButton.click();
        fakeButton.remove();
      }
    }
  };
}
```

# Inputs

```
private renderHiddenInput(container, name, value) {
  let input = container.querySelector('input.hidden-input');
  if (!input) {
    input = container.ownerDocument.createElement('input');
    input.type = 'hidden';
    input.classList.add('hidden-input');
    container.appendChild(input);
  }
  input.name = name;
  input.value = value || '';
}

render() {
  this.renderHiddenInput(this.el, this.name, this.value);
  ...
}
```

# Input Labels

```
render() {  
  this.renderHiddenInput(this.el, this.name, this.value);  
  return (  
    <Host>  
      <label htmlFor="my-input">{this.label}</label>  
      <input id="my-input" ... />  
    </Host>  
  );  
}
```



# Shadow DOM is Just a Tool



```
@Component({  
  tag: 'shadow-input',  
  styleUrls: 'shadow-input.css',  
  scoped: true,  
})
```

Thank You!