JONAS SCHMEDTMANN

THE ULTIMATE REACT COURSE

@JONASSCHMEDTMAN

SECTION

WORKING WITH COMPONENTS, PROPS, AND JSX

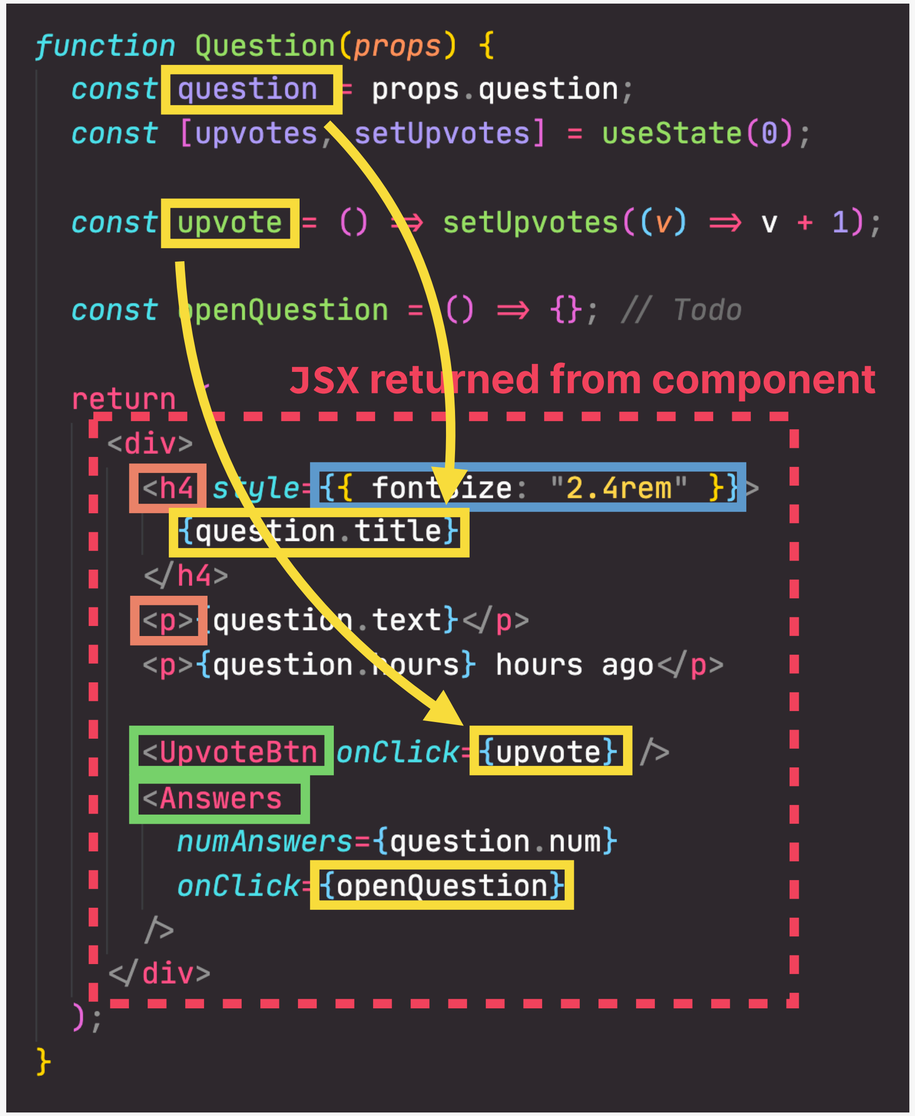
LECTURE

WHAT IS JSX?

WHAT IS JSX?

JSX

- 👉 **Declarative** syntax to **describe** what components **look like** and **how they work**
- 👉 Components must **return** a block of JSX
- 👉 Extension of JavaScript that allows us to **embed JavaScript** **CSS** **and React components into HTML**



WHAT IS JSX?

JSX

- 👉 **Declarative** syntax to **describe** what components **look like** and **how they work**
- 👉 Components must **return** a block of JSX
- 👉 Extension of JavaScript that allows us to **embed JavaScript, CSS, and React components into HTML**
- 👉 Each JSX element is **converted** to a `React.createElement` function call
- 👉 We could use React **without JSX**

```jsx
<header>
  <h1 style="color: red">
    Hello React!
  </h1>
</header>
```


BABEL

```jsx
React.createElement(
  'header',
  null,
  React.createElement(
    'h1',
    { style: { color: 'red' } },
    'Hello React!'
  )
);
```


Hello React!

JSX IS **DECLARATIVE**

IMPERATIVE ← *"How to do things"*

- 👉 Manual DOM element selections and DOM traversing
- 👉 Step-by-step DOM mutations until we reach the desired UI

JS

```
const title = document.querySelector("title")
const upvoteBtn = document.querySelector("btn")
title.textContent = `[0] ${question.title}`;
let upvotes = 0;
upvoteBtn.addEventListener "click", function(){
  upvotes++;
  title.textContent =
    `[${upvotes}] ${question.title}`;
  title.classList.add("upvoted");
});
```

DECLARATIVE ← *"What we want"*

- 👉 Describe what UI should look like using JSX, **based on current data**
- 👉 React is an **abstraction** away from DOM: **we never touch the DOM**
- 👉 Instead, we think of the UI as a **reflection of the current data**

```
function Question(props) {
  const question = props.question;
  const [upvotes, setUpvotes] = useState(0);
  const upvote = () => setUpvotes((v) => v + 1);

  return (
    <div>
      <h4>{question.title}</h4>
      <p>{question.text}</p>
      <UpvoteBtn
        onClick={upvote}
        upvotes={upvotes}
      />
    </div>
  );
}
```

JONAS SCHMEDTMANN

THE ULTIMATE REACT COURSE

@JONASSCHMEDTMAN

SECTION

WORKING WITH COMPONENTS, PROPS, AND JSX

LECTURE

SEPARATION OF CONCERNS

SEPARATION OF CONCERNS?

ONE *TECHNOLOGY* PER FILE

"Traditional" **separation of concerns**

JS

```
let upvotes = 0;
title.textContent = question.title;
const upvote = () => upvotes++;
upvoteBtn.addEventListener("click", upvote);

if (question.num > 0) {
  answer.classList.toggle("hidden");
  firstAnswer.classList.toggle("hidden");
}
```

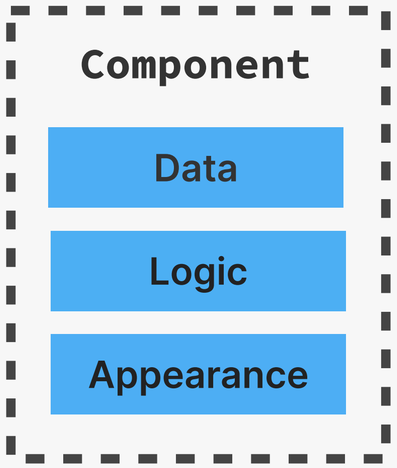
```
<div>
  <h4 class="title"></h4>
  <button class="btn">Upvote</button>

  <div class="answer"></div>
  <div class="first hidden"></div>
</div>
```

HTML

Rise of interactive SPAs → **JavaScript is in charge of HTML** → **Logic and UI are tightly coupled** → **Why keep them separated?** → **React Components + JSX**

SEPARATION OF CONCERNS?

ONE *COMPONENT* PER FILE



HTML and JS
are ***colocated***

```
function Question({ question }) {
  const [upvotes, setUpvotes] = useState(0);
  const upvote = () => setUpvotes((v) => v + 1);

  return (
    <div>
      <h4>{question.title}</h4>
      <UpvoteBtn onClick={upvote} />

      {question.num > 0 ? (
        <Answers numAnswers={question.num} />
      ) : (
        <FirstAnswer />
      )}
    </div>
  );
}
```

JS

HTML

JS

Fundamental reason for **components**

Rise of interactive SPAs → JavaScript is in charge of HTML → Logic and UI are tightly coupled → Why keep them separated? → **React Components + JSX**

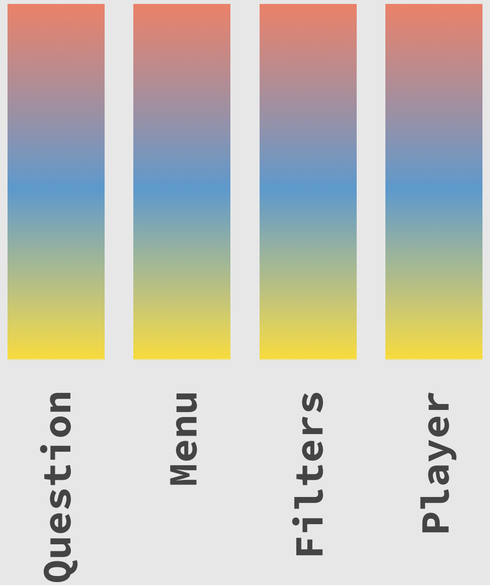
SEPARATION OF CONCERNS!

ONE *TECHNOLOGY* PER FILE

"Traditional" **separation of concerns**

COMPLETELY NEW PARADIGM

ONE *COMPONENT* PER FILE



Each component is **concerned with one piece of the UI**

Rise of interactive SPAs → JavaScript is in charge of HTML → Logic and UI are tightly coupled → Why keep them separated? → **React Components + JSX**

JONAS SCHMEDTMANN

THE ULTIMATE REACT COURSE

@JONASSCHMEDTMAN

SECTION

WORKING WITH COMPONENTS, PROPS, AND JSX

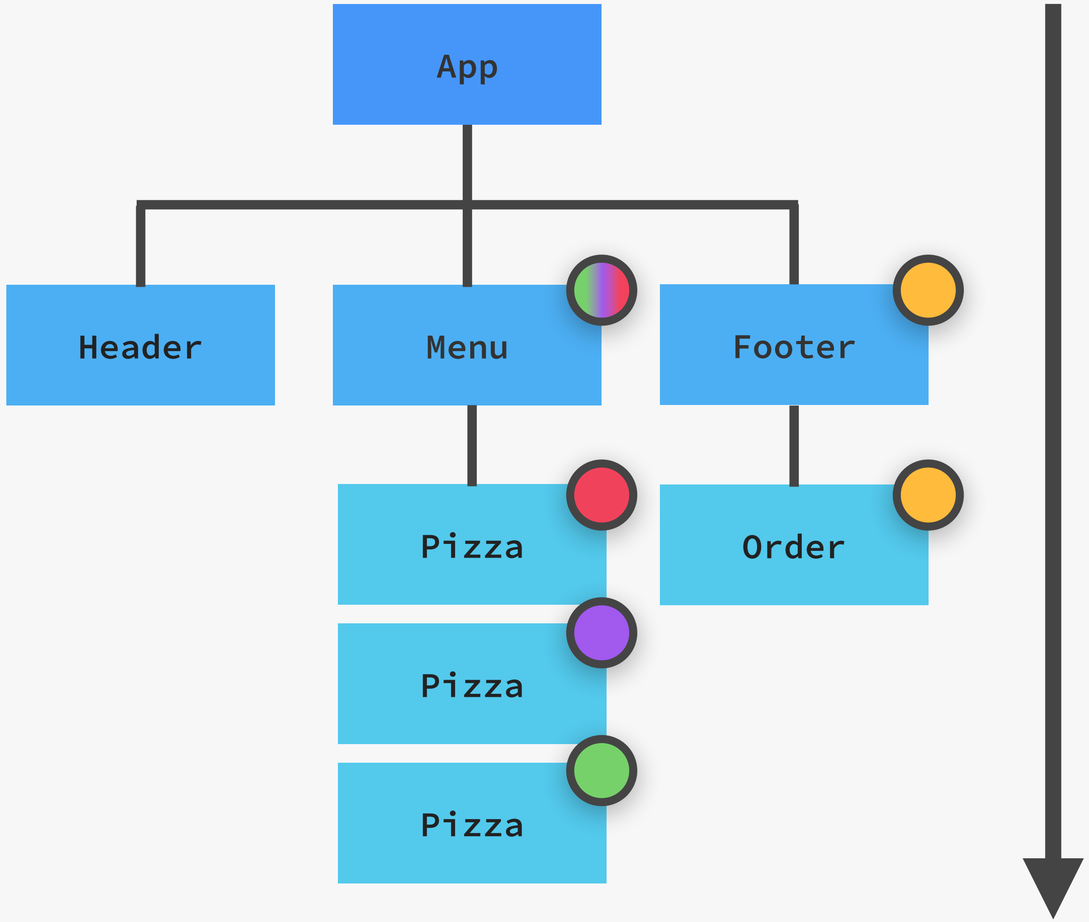
LECTURE

PROPS, IMMUTABILITY, AND ONE-WAY DATA FLOW

REVIEWING **PROPS**

PROPS

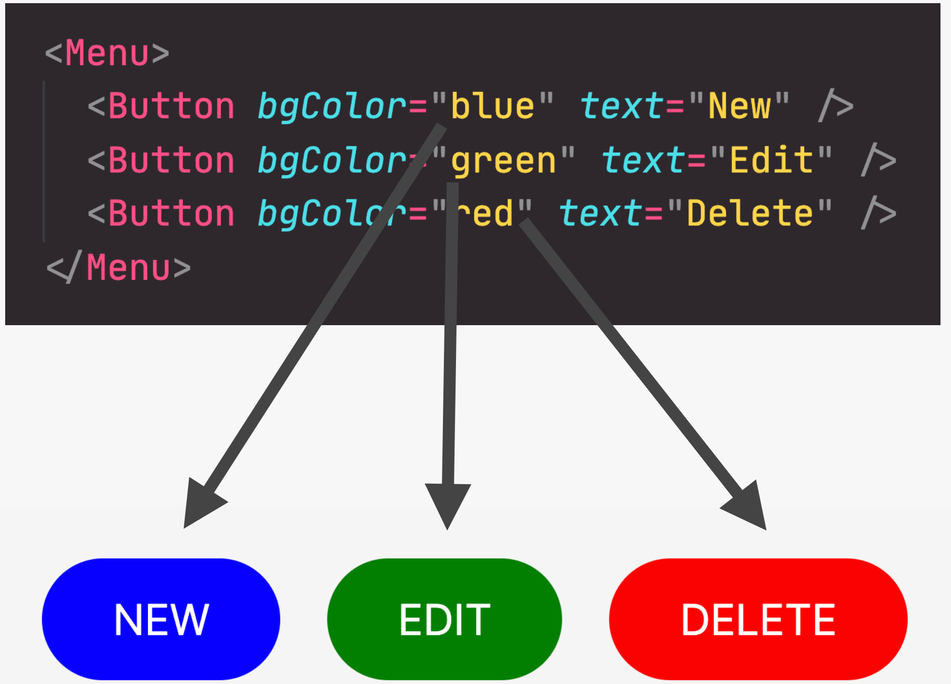
👉 Props are used to pass data from **parent components** to **child components (down** the component tree)



REVIEWING **PROPS**

PROPS

- 👉 Props are used to pass data from **parent components** to **child components** (**down** the component tree)
- 👉 Essential tool to **configure** and **customize** components (like function parameters)
- 👉 With props, parent components **control** how child components look and work



REVIEWING **PROPS**

PROPS

- 👉 Props are used to pass data from **parent components** to **child components** (**down** the component tree)
- 👉 Essential tool to **configure** and **customize** components (like function parameters)
- 👉 With props, parent components **control** how child components look and work
- 👉 **Anything** can be passed as props: single values, arrays, objects, functions, even other components

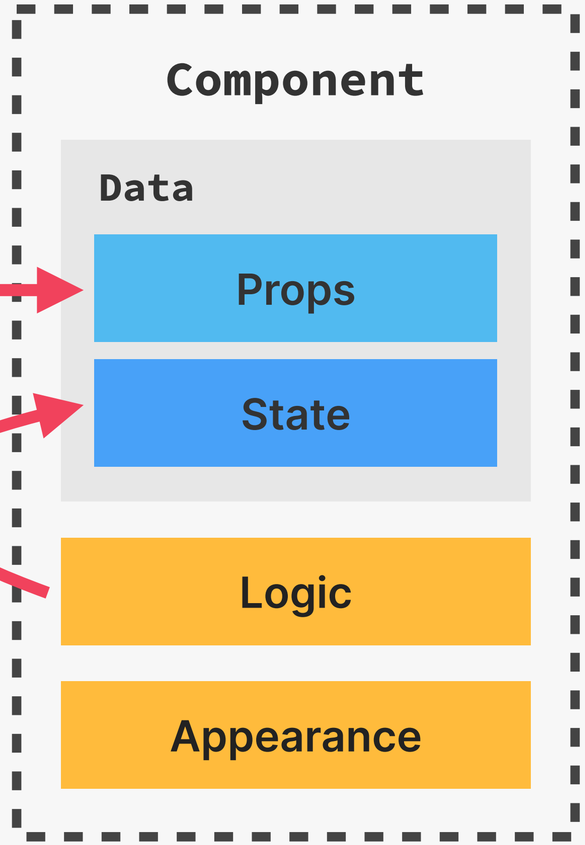
```jsx
function CourseRating() {
  const [rating, setRating] = useState(0);

  return (
    <Rating
      text="Course rating"
      currentRating={rating}
      numOptions={3}
      options={["Terrible", "Okay", "Amazing"]}
      allRatings={{ num: 2390, avg: 4.8 }}
      setRating={setRating}
      component={Star}
    />
  );
}

function Star() {
  // To do
}
```

PROPS ARE **READ-ONLY!**

Props is data coming from the **outside**, and can **only** be updated by the **parent component**

Parent Component

State is **internal** data that can be updated by the **component's** logic




```
let x = 7;

function Component(){
  x = 23;
  return <h1>Number {x}</h1>
}
```

Don't do this!

☝️ Props are read-only, they are **immutable**! This is one of React's strict rules.

☝️ If you need to mutate props, you actually **need state**

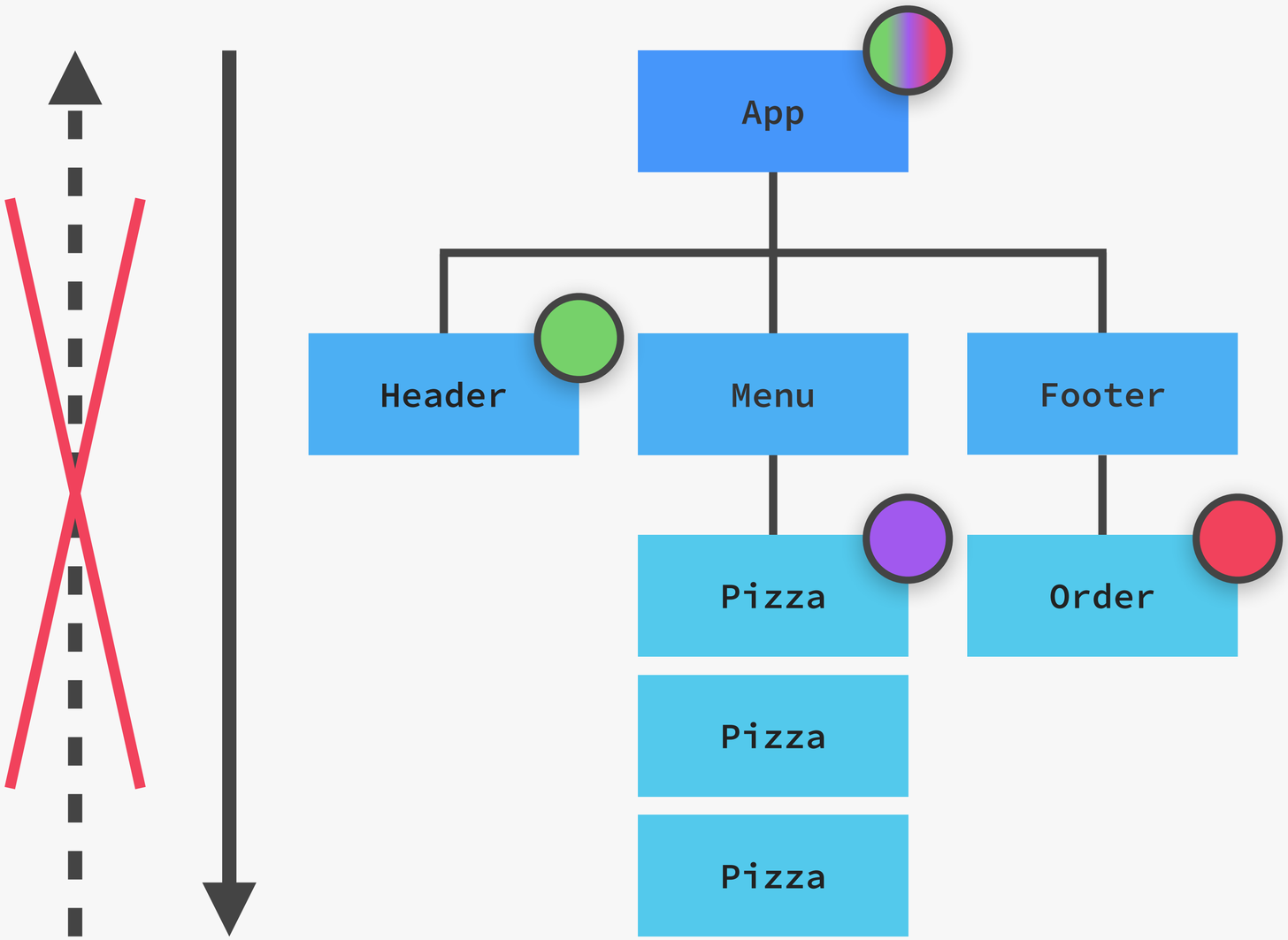
⬇️ WHY?

👉 Mutating props would affect parent, creating **side effects** (not pure)

👉 Components have to be **pure functions** in terms of props and state

👉 This allows React to optimize apps, avoid bugs, make apps predictable

ONE-WAY DATA FLOW



ONE-WAY DATA FLOW...

- 👍 ... makes applications more predictable and easier to understand
- 👍 ... makes applications easier to debug, as we have more control over the data
- 👍 ... is more performant

*Angular has **two-way** data flow*

JONAS SCHMEDTMANN

THE ULTIMATE REACT COURSE

@JONASSCHMEDTMAN

SECTION

WORKING WITH COMPONENTS, PROPS, AND JSX

LECTURE

THE RULES OF JSX

RULES OF JSX

GENERAL JSX RULES

- 👉 JSX works essentially like HTML, but we can enter "**JavaScript mode**" by using `{}` (for text or attributes)
- 👉 We can place **JavaScript expressions** inside `{}`. Examples: reference variables, create arrays or objects, `[].map()`, ternary operator
- 👉 Statements are **not allowed** (`if/else`, `for`, `switch`)
- 👉 JSX produces a **JavaScript expression**

==

```
const el = <h1>Hello React!</h1>;
```

```
const el = React.createElement("h1", null, "Hello React!");
```

  1. We can place **other pieces of JSX** inside `{}`
  2. We can write JSX **anywhere** inside a component (in `if/else`, assign to variables, pass it into functions)

- 👉 A piece of JSX can only have **one root element**. If you need more, use `<React.Fragment>` (or the short `<>`)

DIFFERENCES BETWEEN JSX AND HTML

- 👉 `className` instead of HTML's `class`
- 👉 `htmlFor` instead of HTML's `for`
- 👉 Every tag needs to be **closed**. Examples: `<img />` or `<br />`
- 👉 All event handlers and other properties need to be **camelCased**. Examples: `onClick` or `onMouseOver`
- 👉 **Exception**: `aria-*` and `data-*` are written with dashes like in HTML
- 👉 CSS inline styles are written like this: `{{<style>}}` (to reference a variable, and then an object)
- 👉 CSS property names are also **camelCased**
- 👉 Comments need to be in `{}` (because they are JS)

JONAS SCHMEDTMANN

THE ULTIMATE REACT COURSE

@JONASSCHMEDTMAN

SECTION

WORKING WITH COMPONENTS, PROPS, AND JSX

LECTURE

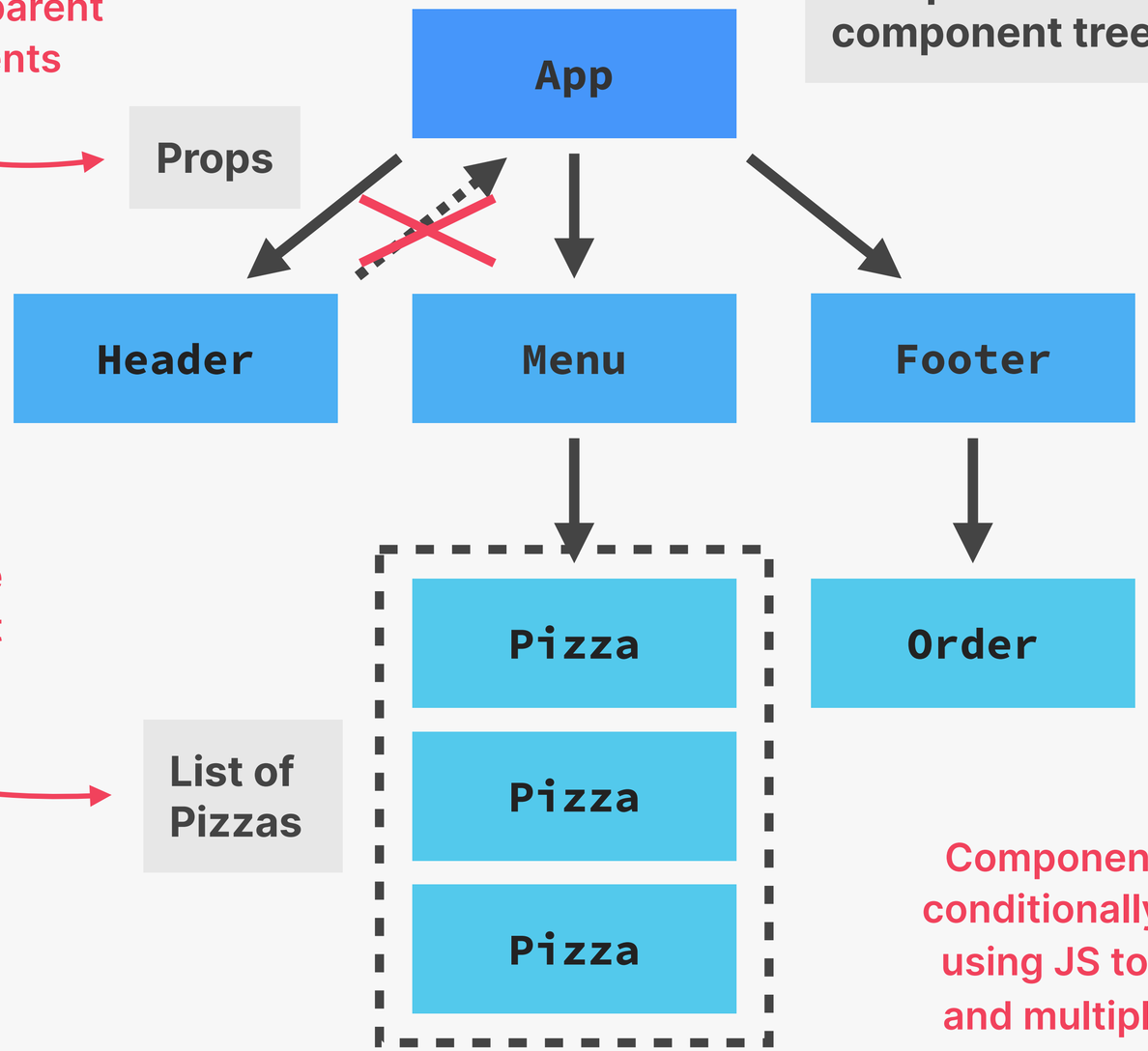
SECTION SUMMARY

🎯 SECTION **SUMMARY**

To pass data from parent to child components

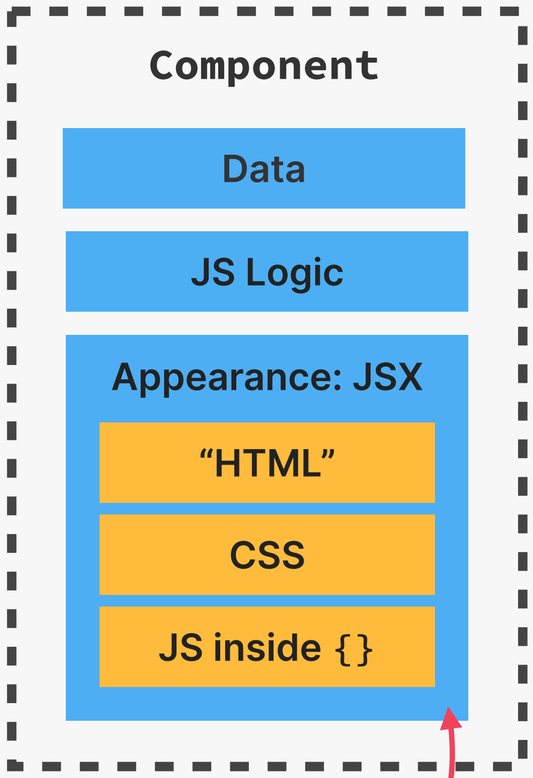
Props

Components in component tree



Rendering multiple components at once using the JavaScript `.map()` method

List of Pizzas



Components can be conditionally rendered using JS tools: `&&`, `?`, and multiple `return`

JSX block is what we return from a component