



React JS

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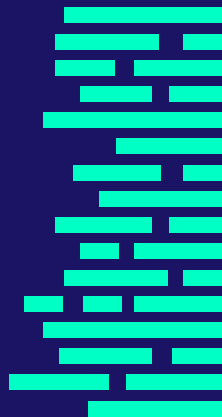
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Project Example





01

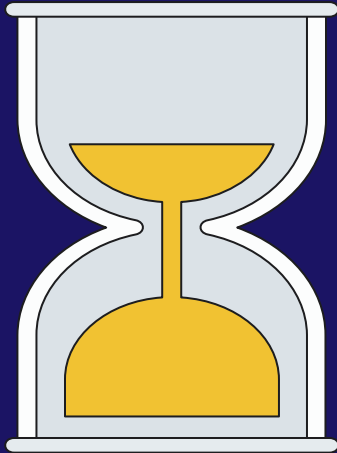
Introduction to Frameworks

What is a Framework?



It is a defined conceptual and technological support structure, normally with libraries and a programming structure.

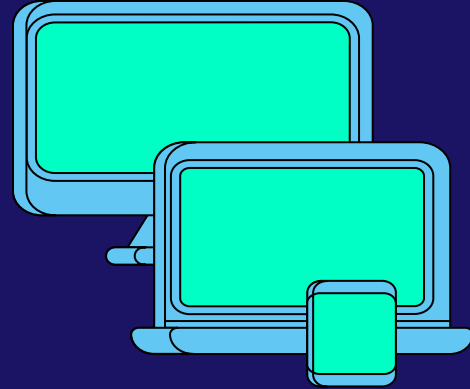
Why should I use a framework? What problems do they solve for me?



- Every time we change our application's state, we need to update the UI to match.
- **Predictability and maintainability** are essential for the health and longevity of software

Frameworks help developers

- They ease up a lot the communication between the developer and the DOM object.
- Easier code -> Easier readability -> Easier maintainability -> Less time spent



Vanilla JS

- Long code
- Needs good knowledge of DOM

```
function buildTodoItemEl(id, name) {  
  const item =  
    document.createElement('li');  
  const span =  
    document.createElement('span');  
  const textContent =  
    document.createTextNode(name);  
  span.appendChild(textContent);  
  item.id = id;  
  item.appendChild(span);  
  return item;  
}
```

ReactJS (JSX)

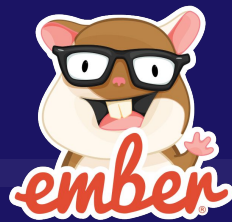
- Shorter code.
- Really comprehensible
- Looks just like HTML

```
render() {  
  return (  
    <li id={this.props.id}>  
      <span>{this.props.name}</span>  
    </li>  
  );  
}
```


Which framework should I use?



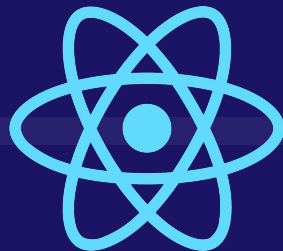
Angular



Ember



Vue



React

Ember



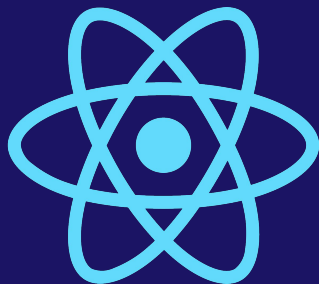
- Oldest framework of the four
- Fewer users than more modern alternatives.
- Stability, community support, and some clever coding principles.

Vue

- Youngest of the four.
- Extends HTML with some of its own code.
- Relies on modern, standard JavaScript.



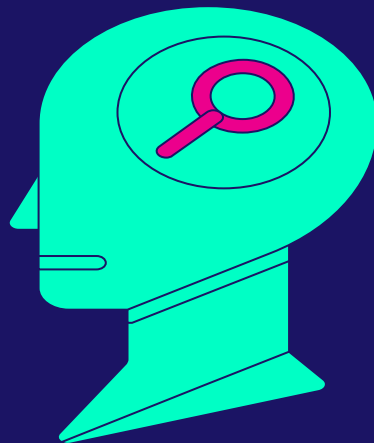
Angular And ReactJS



- Both Component based with declarative HTML
- Performance
 - Angular -> Real DOM (Upwork)
 - React -> Virtual DOM (Instagram)

Ask yourself

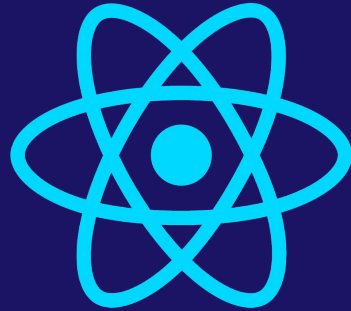
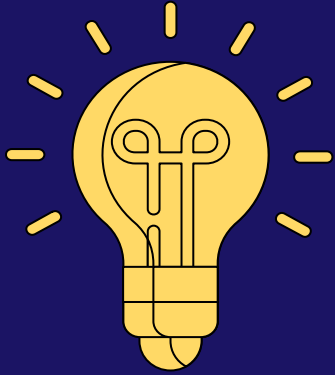
- What browsers does the framework support?
- What domain-specific languages (DSL) does the framework utilize?
- Does the framework have a strong community and good docs?



Matrix of the “Big Four”




	Browsers	Preferred DSL	Supported DSLs
Angular	IE9+	TypeScript	HTML-based; TypeScript
React	Modern (IE9+ with Polyfills)	JSX	JSX; TypeScript
Vue	IE9+	HTML-based	HTML-based, JSX, Pug
Ember	Modern (IE9+ in Ember version 2.18)	Handlebars	Handlebars, TypeScript

What is ReactJS?



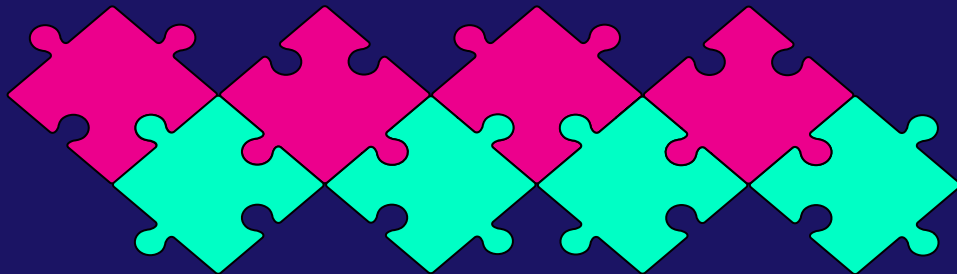
React

ReactJS is Declarative

- Easier to debug 
- Easier to understand 
- Predictable 

ReactJS is Component Based

Build webs composing encapsulated components.





02

Main Concepts

Installation



Script tag



Create-react-app

```
npx create-react-app my-app  
cd my-app  
npm start
```

```
<script src="https://unpkg.com/react@17/umd/react.development.js" defer></script>  
<script src="https://unpkg.com/react-dom@17/umd/react-dom.development.js" defer></script>
```

Introduction to JSX



1. It's the way React communicates with the DOM object
2. It prevents injection attacks
3. It produces React Elements
4. Works just HTML but it uses camelCase property naming instead HTML attribute names
 - className
 - tabIndex

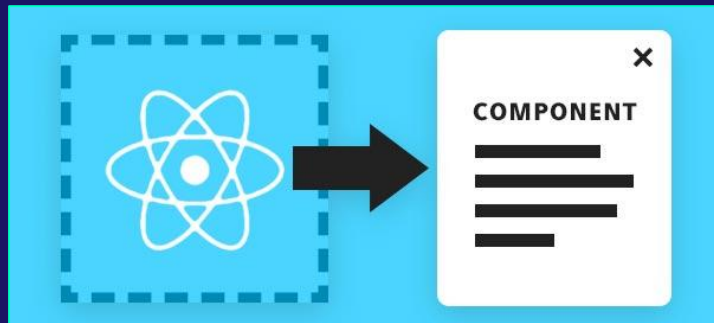
Example of JSX Code

1. Default JSX
`const title = <h1>Hello World</h1>;`
2. JSX with JavaScript Variables
`const city = "Santa Cruz";
const cityTitle = <h1>Welcome to {city}</h1>;`
3. Get values, calling javascript Variables
`const getFullName(firstName, surName) {
 return firstName + ' ' + surName;
}
const element = (
 <h1> Hello, {getFullName(userName, userSurName)}
 </h1>
);`

Render Elements

Create an HTML web page

1. Create a DOM to Render
 - a. Normally a div with id "root"
2. Pass it to ReactDOM.render()
 - a. The first component to render
 - b. The DOM to render it



See "Hello World" Example



03

Components and Properties



What is a Component

“Components are like JavaScript functions. They accept arbitrary inputs (Properties) and return React elements describing what should appear on the screen”. Its composed of:

- Properties
- States

About Properties

- Create properties, when render a method (Like HTML):
"property"="value"
- Received by Class constructor
(Don't forget super!)
- Access using this.property.name
- Properties are immutable



See "WelcomeMessage" Example



04

States of the Component



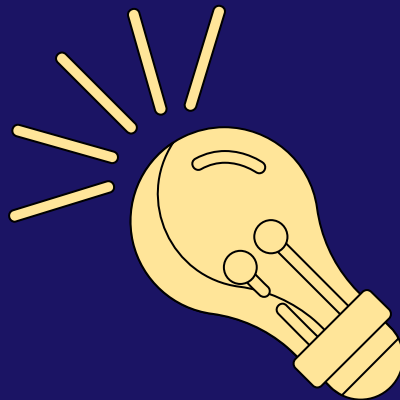
What is a State

"State is an object which store the properties values that belongs to the component".

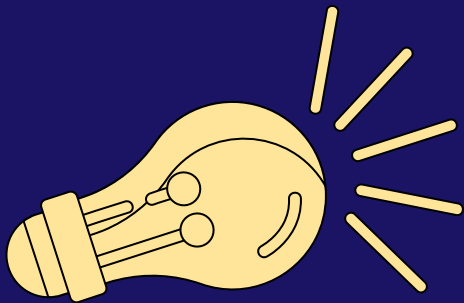
"When the ***state change***, the component will ***render again***"

About States (I)

1. Initialize it in the Constructor
2. Change state only using **setState()** function
 - a. If use *this.state.property*, will **NOT** render the component again
3. Important Methods:
 - a. **ComponentDidMount()**
 - b. **ComponentDidUnMount()**
 - c. **ComponentWillUpdate()**



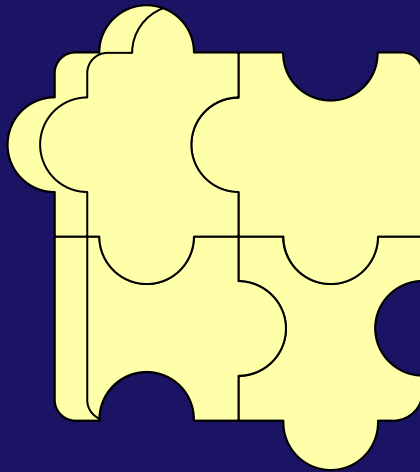
About States (II)



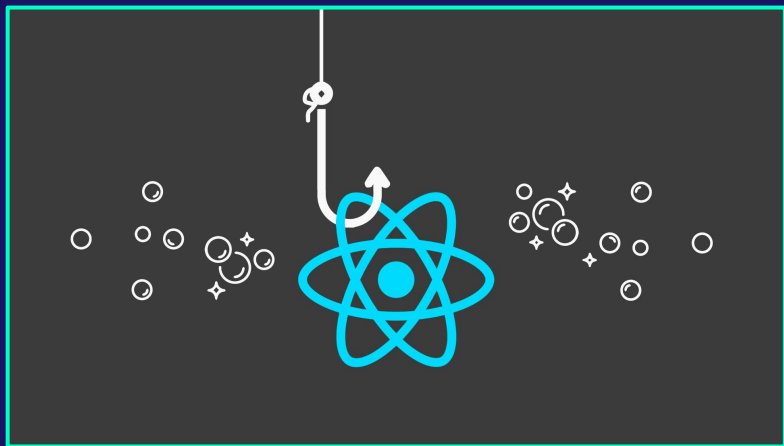
1. Remember **DO NOT UPDATE DIRECTLY**, use `setState()` function
2. Updates can be Asynchronous.
3. You can change one state at time, or various.

About States (III)

1. **ComponentDidMount()** : Called when the component is mounted (When created and after constructor)
2. **ComponentDidUnmount()** : Called when the componen is unMount (When is deleted)
3. **ComponentWillUpdate()** : Called when the state change



See "clock" and "CanvasClock" Example



Hooks

Hooks are a new addition in React. They let you use state and other React features without writing a class.



Examples of Hooks

useState

useEffect

useContext

useReducer

useMemo

useRef



05

Handling Events of Components

Two differences from DOM



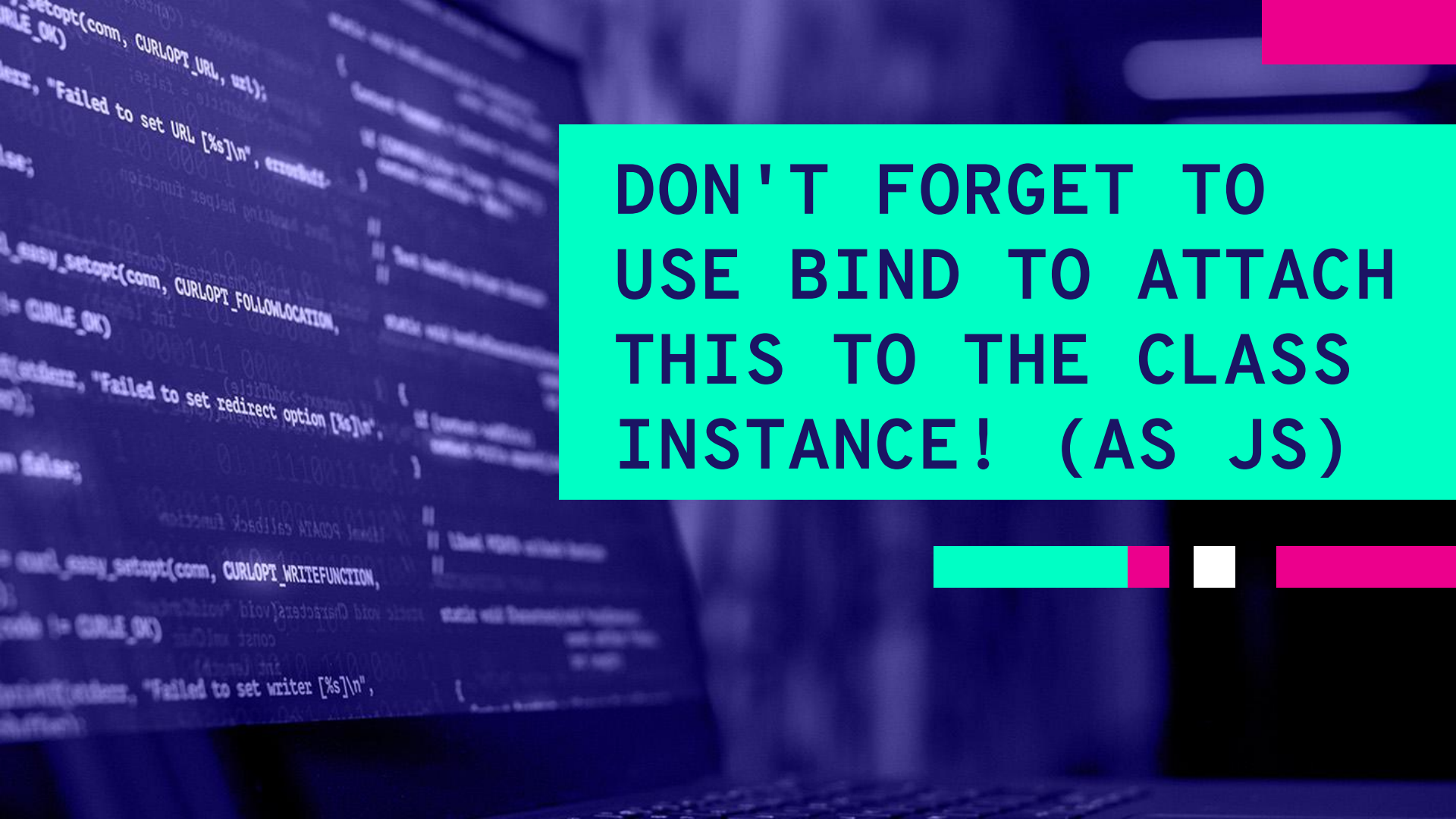
Use camelCase

React events are named using camelCase, rather than lowercase




Only Functions

With JSX you pass a function as the event, rather than a String



**DON'T FORGET TO
USE BIND TO ATTACH
THIS TO THE CLASS
INSTANCE! (AS JS)**



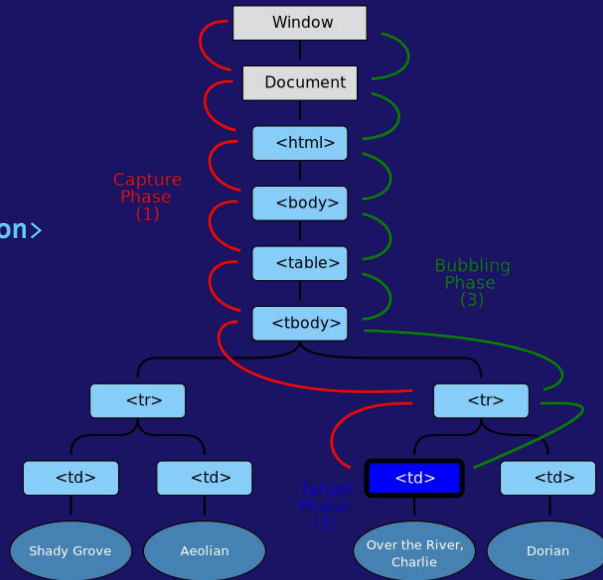
Pass arguments function

Arrow function

```
<button onClick={{event) => this.deleteRow(id, event)}}>Delete Row</button>
```

This and Bind

```
<button onClick={this.deleteRow.bind(this, id)}>Delete Row</button>
```



Other events

Pointer

Image

Mouse

Forms

Touch

Clipboard



Click to see all events



06

CONDITION RENDERING



Can use if/else

- Can use if/else to render one or other element.
- If we won't render an element, just return null in render function

Condition Render Example

```
function Greeting(props) {  
  const isLoggedIn = props.isLoggedIn;  
  
  return (  
    if(isLoggedIn) {  
      return <UserGreeting/>;  
    } else {  
      return <GuestGreeting/>;  
    }  
  );  
}
```

*"Function will return different components
depending if user is logged or not!"*



See "Colors" Example



07

LISTS AND FORMS

List and keys

- Lists use map function to create each of its items
- Each item must have a key.

Example:

```
const listItems = todos.map((todo, index) =>  
  <li key={index}>  
    {todo.text}  
  </li>  
);
```

Keys



A key is a property, which we will send to each element of the li DOM list.

The list key must be unique just in the context where it is created, not in the global context.



Forms and input “text”

- Inputs of the forms contain a state which stores the **value** of the input
- It updates the state when the user changes the input

Example:

```
handleChange(event) {  
  this.setState({value: event.target.value});  
}
```

Forms and input “submit”

- When the user presses the submit button, it will call the handleSubmit function, because we put a onSubmit event into the form
- We use event.preventDefault(), because, if not, the page will send the form, and we get an error message.

Example:

```
handleSubmit(event) {  
  alert('A name was submitted: ' + this.state.value);  
  event.preventDefault();  
}
```



Forms and select

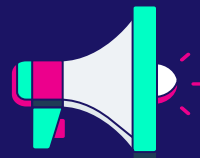
- The options of the select tag, we don't use "select" to select the default options. Instead of this, we add a value attribute into the select

Example:

```
<select value={this.state.value}  
onChange={this.handleChange}>  
  <option value="grapefruit">Grapefruit</option>  
  <option value="lime">Lime</option>  
  <option value="coconut">Coconut</option>  
  <option value="mango">Mango</option>  
</select>
```



See "Market" Example





08

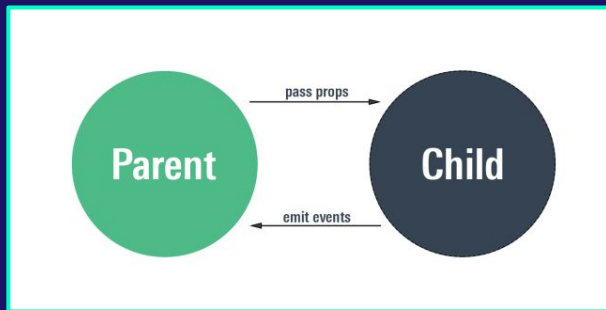
Lifting State Up

What is Lifting State Up?

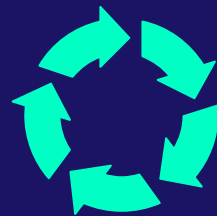
"When various components with different states, if one of state change, need to change all states"



Click to see example on CodePen



To do this, parent must send a handling event to a children.





09

Composition VS Inheritance

Use of `props.children`

- Used to pass components to other components, where the component does not know which are their children.
- Also can send components as props



[Click to see example on CodePen](#)

Inheritance

Derive properties and characteristics
from one class to other



Composition

Use objects inside other
objects

YOU DON'T NEED TO USE INHERITANCE IN REACT JS

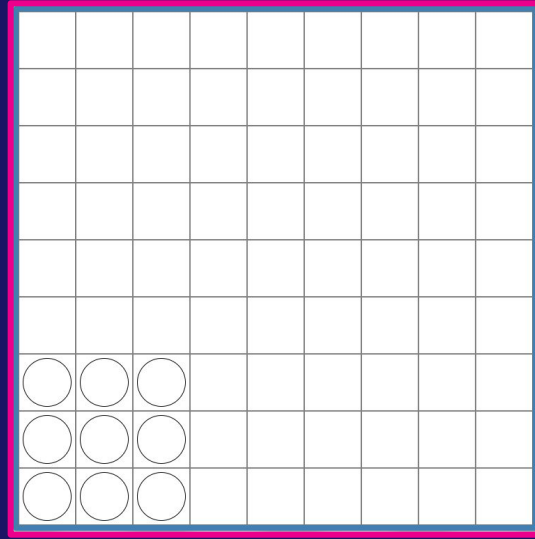




10

Project Example

Halma Game



See “Halma” Example

Real Projects

01

Calculator: implementation of the iOS calculator

02

Emoji Search: React app for searching emoji

03

BMI Calculator: React app for calculation BMI

04

Counter App: Small shopping cart example

Complete App

Builder Book: App to write and host documentation or sell books

Click in
description
to see the
project!

Bibliography

Resources:

- reactjs.org
- [Developer Mozilla: Understanding client-side JavaScript frameworks](#)
- [Slidesgo](#)
- [Angular vs React](#)

THANKS !

Do you have any questions?

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