React Interview Questions & Answers

> Click :star:if you like the project. Pull Request are highly appreciated. Follow me @SudheerJonna for technical updates.

Learn to code and get hired with Zero To Mastery:

1. This React course is good if you're struggling to learn React beyond the basics
2. This coding interview bootcamp is helpful if you're serious about getting hired as a developer

---

Note: This repository is specific to ReactJS. Please check Javascript Interview questions for core javascript questions.

Downloading PDF/Epub formats

You can download the PDF and Epub version of this repository from the latest run on the actions tab.

Table of Contents

No.	Questions
	Core React
1	What is React?
2	What are the major features of React?
3	What is JSX?
4	What is the difference between Element and Component?
5	How to create components in React?
6	When to use a Class Component over a Function Component?
7	What are Pure Components?
8	What is state in React?
9	What are props in React?
10	What is the difference between state and props?
11	Why should we not update the state directly?
12	What is the purpose of callback function as an argument of setState()?
13	What is the difference between HTML and React event handling?
14	How to bind methods or event handlers in JSX callbacks?
15	How to pass a parameter to an event handler or callback?
16	What are synthetic events in React?
17	What are inline conditional expressions?
18	What is "key" prop and what is the benefit of using it in arrays of elements?
19	What is the use of refs?
20	How to create refs?
21	What are forward refs?
22	Which is preferred option with in callback refs and findDOMNode()?

No.	Questions
23	Why are String Refs legacy?
24	What is Virtual DOM?
25	How Virtual DOM works?
26	What is the difference between Shadow DOM and Virtual DOM?
27	What is React Fiber?
28	What is the main goal of React Fiber?
29	What are controlled components?
30	What are uncontrolled components?
31	What is the difference between createElement and cloneElement?
32	What is Lifting State Up in React?
33	What are the different phases of component lifecycle?
34	What are the lifecycle methods of React?
35	What are Higher-Order components?
36	How to create props proxy for HOC component?
37	What is context?
38	What is children prop?
39	How to write comments in React?
40	What is the purpose of using super constructor with props argument?
41	What is reconciliation?
42	How to set state with a dynamic key name?
43	What would be the common mistake of function being called every time the component renders?
44	Is lazy function supports named exports?
45	Why React uses className over class attribute?
46	What are fragments?
47	Why fragments are better than container divs?
48	What are portals in React?
49	What are stateless components?
50	What are stateful components?
51	How to apply validation on props in React?
52	What are the advantages of React?
53	What are the limitations of React?
54	What are error boundaries in React v16
55	How error boundaries handled in React v15?

No.	Questions
56	What are the recommended ways for static type checking?
57	What is the use of react-dom package?
58	What is the purpose of render method of react-dom?
59	What is ReactDOMServer?
60	How to use InnerHtml in React?
61	How to use styles in React?
62	How events are different in React?
63	What will happen if you use setState in constructor?
64	What is the impact of indexes as keys?
65	Is it good to use setState() in componentWillMount() method?
66	What will happen if you use props in initial state?
67	How do you conditionally render components?
68	Why we need to be careful when spreading props on DOM elements??
69	How you use decorators in React?
70	How do you memoize a component?
71	How you implement Server-Side Rendering or SSR?
72	How to enable production mode in React?
73	What is CRA and its benefits?
74	What is the lifecycle methods order in mounting?
75	What are the lifecycle methods going to be deprecated in React v16?
76	What is the purpose of getDerivedStateFromProps() lifecycle method?
77	What is the purpose of getSnapshotBeforeUpdate() lifecycle method?
78	Do Hooks replace render props and higher order components?
79	What is the recommended way for naming components?
80	What is the recommended ordering of methods in component class?
81	What is a switching component?
82	Why we need to pass a function to setState()?
83	What is strict mode in React?
84	What are React Mixins?
85	Why is isMounted() an anti-pattern and what is the proper solution?
86	What are the Pointer Events supported in React?
87	Why should component names start with capital letter?
88	Are custom DOM attributes supported in React v16?

No.	Questions
89	What is the difference between constructor and getInitialState?
90	Can you force a component to re-render without calling setState?
91	What is the difference between super() and super(props) in React using ES6 classes?
92	How to loop inside JSX?
93	How do you access props in attribute quotes?
94	What is React PropType array with shape?
95	How to conditionally apply class attributes?
96	What is the difference between React and ReactDOM?
97	Why ReactDOM is separated from React?
98	How to use React label element?
99	How to combine multiple inline style objects?
100	How to re-render the view when the browser is resized?
101	What is the difference between setState and replaceState methods?
102	How to listen to state changes?
103	What is the recommended approach of removing an array element in react state?
104	Is it possible to use React without rendering HTML?
105	How to pretty print JSON with React?
106	Why you can't update props in React?
107	How to focus an input element on page load?
108	What are the possible ways of updating objects in state?
110	How can we find the version of React at runtime in the browser?
111	What are the approaches to include polyfills in your create-react-app?
112	How to use https instead of http in create-react-app?
113	How to avoid using relative path imports in create-react-app?
114	How to add Google Analytics for react-router?
115	How to update a component every second?
116	How do you apply vendor prefixes to inline styles in React?
117	How to import and export components using react and ES6?
118	What are the exceptions on React component naming?
119	Why is a component constructor called only once?
120	How to define constants in React?
121	How to programmatically trigger click event in React?
122	Is it possible to use async/await in plain React?

No.	Questions
123	What are the common folder structures for React?
124	What are the popular packages for animation?
125	What is the benefit of styles modules?
126	What are the popular React-specific linters?
127	How to make AJAX call and In which component lifecycle methods should I make an AJAX call?
128	What are render props?
	React Router
129	What is React Router?
130	How React Router is different from history library?
131	What are the \ components of React Router v4?
132	What is the purpose of push and replace methods of history?
133	How do you programmatically navigate using React router v4?
134	How to get query parameters in React Router v4
135	Why you get "Router may have only one child element" warning?
136	How to pass params to history.push method in React Router v4?
137	How to implement default or NotFound page?
138	How to get history on React Router v4?
139	How to perform automatic redirect after login?
	React Internationalization
140	What is React-Intl?
141	What are the main features of React Intl?
142	What are the two ways of formatting in React Intl?
143	How to use FormattedMessage as placeholder using React Intl?
144	How to access current locale with React Intl
145	How to format date using React Intl?
	React Testing
146	What is Shallow Renderer in React testing?
147	What is TestRenderer package in React?
148	What is the purpose of ReactTestUtils package?
149	What is Jest?
150	What are the advantages of Jest over Jasmine?
151	Give a simple example of Jest test case
	React Redux

No.	Questions
152	What is Flux?
153	What is Redux?
154	What are the core principles of Redux?
155	What are the downsides of Redux compared to Flux?
156	What is the difference between mapStateToProps() and mapDispatchToProps()?
157	Can I dispatch an action in reducer?
158	How to access Redux store outside a component?
159	What are the drawbacks of MVW pattern
160	Are there any similarities between Redux and RxJS?
161	How to dispatch an action on load?
162	How to use connect from React Redux?
163	How to reset state in Redux?
164	Whats the purpose of at symbol in the redux connect decorator?
165	What is the difference between React context and React Redux?
166	Why are Redux state functions called reducers?
167	How to make AJAX request in Redux?
168	Should I keep all component's state in Redux store?
169	What is the proper way to access Redux store?
170	What is the difference between component and container in React Redux?
171	What is the purpose of the constants in Redux?
172	What are the different ways to write mapDispatchToProps()?
173	What is the use of the ownProps parameter in mapStateToProps() and mapDispatchToProps()?
174	How to structure Redux top level directories?
175	What is redux-saga?
176	What is the mental model of redux-saga?
177	What are the differences between call and put in redux-saga
178	What is Redux Thunk?
179	What are the differences between redux-saga and redux-thunk
180	What is Redux DevTools?
181	What are the features of Redux DevTools?
182	What are Redux selectors and Why to use them?
183	What is Redux Form?
184	What are the main features of Redux Form?

No.	Questions
185	How to add multiple middlewares to Redux?
186	How to set initial state in Redux?
187	How Relay is different from Redux?
188	What is an action in Redux?
	React Native
188	What is the difference between React Native and React?
189	How to test React Native apps?
190	How to do logging in React Native?
191	How to debug your React Native?
	React supported libraries and Integration
192	What is reselect and how it works?
193	What is Flow?
194	What is the difference between Flow and PropTypes?
195	How to use font-awesome icons in React?
196	What is React Dev Tools?
197	Why is DevTools not loading in Chrome for local files?
198	How to use Polymer in React?
199	What are the advantages of React over Vue.js?
200	What is the difference between React and Angular?
201	Why React tab is not showing up in DevTools?
202	What are styled components?
203	Give an example of Styled Components?
204	What is Relay?
205	How to use TypeScript in create-react-app application?
	Miscellaneous
206	What are the main features of reselect library?
207	Give an example of reselect usage?
209	Does the statics object work with ES6 classes in React?
210	Can Redux only be used with React?
211	Do you need to have a particular build tool to use Redux?
212	How Redux Form initialValues get updated from state?
213	How React PropTypes allow different type for one prop?
214	Can I import an SVG file as react component?

No.	Questions
215	Why are inline ref callbacks or functions not recommended?
216	What is render hijacking in React?
217	What are HOC factory implementations?
218	How to pass numbers to React component?
219	Do I need to keep all my state into Redux? Should I ever use react internal state?
220	What is the purpose of registerServiceWorker in React?
221	What is React memo function?
222	What is React lazy function?
223	How to prevent unnecessary updates using setState?
224	How do you render Array, Strings and Numbers in React 16 Version?
225	How to use class field declarations syntax in React classes?
226	What are hooks?
227	What rules need to be followed for hooks?
228	How to ensure hooks followed the rules in your project?
229	What are the differences between Flux and Redux?
230	What are the benefits of React Router V4?
231	Can you describe about componentDidCatch lifecycle method signature?
232	In which scenarios error boundaries do not catch errors?
233	Why do you not need error boundaries for event handlers?
234	What is the difference between try catch block and error boundaries?
235	What is the behavior of uncaught errors in react 16?
236	What is the proper placement for error boundaries?
237	What is the benefit of component stack trace from error boundary?
238	What is the required method to be defined for a class component?
239	What are the possible return types of render method?
240	What is the main purpose of constructor?
241	Is it mandatory to define constructor for React component?
242	What are default props?
243	Why should not call setState in componentWillUnmount?
244	What is the purpose of getDerivedStateFromError?
245	What is the methods order when component re-rendered?
246	What are the methods invoked during error handling?
247	What is the purpose of displayName class property?

No.	Questions
248	What is the browser support for react applications?
249	What is the purpose of unmountComponentAtNode method?
250	What is code-splitting?
251	What is the benefit of strict mode?
252	What are Keyed Fragments?
253	Does React support all HTML attributes?
254	What are the limitations with HOCs?
255	How to debug forwardRefs in DevTools?
256	When component props defaults to true?
257	What is NextJS and major features of it?
258	How do you pass an event handler to a component?
259	Is it good to use arrow functions in render methods?
260	How to prevent a function from being called multiple times?
261	How JSX prevents Injection Attacks?
262	How do you update rendered elements?
263	How do you say that props are read only?
264	How do you say that state updates are merged?
265	How do you pass arguments to an event handler?
266	How to prevent component from rendering?
267	What are the conditions to safely use the index as a key?
268	Is it keys should be globally unique?
269	What is the popular choice for form handling?
270	What are the advantages of formik over redux form library?
271	Why do you not required to use inheritance?
272	Can I use web components in react application?
273	What is dynamic import?
274	What are loadable components?
275	What is suspense component?
276	What is route based code splitting?
277	Give an example on How to use context?
278	What is the purpose of default value in context?
279	How do you use contextType?
280	What is a consumer?

No.	Questions
281	How do you solve performance corner cases while using context?
282	What is the purpose of forward ref in HOCs?
283	Is it ref argument available for all functions or class components?
284	Why do you need additional care for component libraries while using forward refs?
285	How to create react class components without ES6?
286	Is it possible to use react without JSX?
287	What is diffing algorithm?
288	What are the rules covered by diffing algorithm?
289	When do you need to use refs?
290	Is it prop must be named as render for render props?
291	What are the problems of using render props with pure components?
292	How do you create HOC using render props?
293	What is windowing technique?
294	How do you print falsy values in JSX?
295	What is the typical use case of portals?
296	How do you set default value for uncontrolled component?
297	What is your favorite React stack?
298	What is the difference between Real DOM and Virtual DOM?
299	How to add Bootstrap to a react application?
300	Can you list down top websites or applications using react as front end framework?
301	Is it recommended to use CSS In JS technique in React?
302	Do I need to rewrite all my class components with hooks?
303	How to fetch data with React Hooks?
304	Is Hooks cover all use cases for classes?
305	What is the stable release for hooks support?
306	Why do we use array destructuring (square brackets notation) in useState?
307	What are the sources used for introducing hooks?
308	How do you access imperative API of web components?
309	What is formik?
310	What are typical middleware choices for handling asynchronous calls in Redux?
311	Do browsers understand JSX code?
312	Describe about data flow in react?

No.	Questions
313	What is react scripts?
314	What are the features of create react app?
315	What is the purpose of renderToNodeStream method?
316	What is MobX?
317	What are the differences between Redux and MobX?
318	Should I learn ES6 before learning ReactJS?
319	What is Concurrent Rendering?
320	What is the difference between async mode and concurrent mode?
321	Can I use javascript urls in react16.9?
322	What is the purpose of eslint plugin for hooks?
323	What is the difference between Imperative and Declarative in React?
324	What are the benefits of using typescript with reactjs?
325	How do you make sure that user remains authenticated on page refresh while using Context API State Management?
326	What are the benefits of new JSX transform?
327	How does new JSX transform different from old transform?
328	How do you get redux scaffolding using create-react-app?
329	What are React Server components?
330	What is prop drilling?
331	What is state mutation and how to prevent it?
332	What is the difference between useState and useRef hook?

Core React

1. **What is React?**

   React is an **open-source front-end JavaScript library** that is used for building user interfaces, especially for single-page applications. It is used for handling view layer for web and mobile apps. React was created by Jordan Walke, a software engineer working for Facebook. React was first deployed on Facebook's News Feed in 2011 and on Instagram in 2012.

   ⬆ Back to Top

2. **What are the major features of React?**

   The major features of React are:

   - It uses **VirtualDOM** instead of RealDOM considering that RealDOM manipulations are expensive.
   - Supports **server-side rendering**.
   - Follows **Unidirectional** data flow or data binding.
   - Uses **reusable/composable** UI components to develop the view.

   ⬆ Back to Top

3. **What is JSX?**

   JSX is a XML-like syntax extension to ECMAScript (the acronym stands for *JavaScript XML*). Basically it just provides syntactic sugar for the `React.createElement()` function, giving us expressiveness of JavaScript along with HTML like template syntax.

   In the example below text inside `<h1>` tag is returned as JavaScript function to the render function.

```jsx harmony class App extends React.Component { render() { return(<div> <h1>{'Welcome to React world!'}</h1> </div>) } }```

⬆ Back to Top

4. **What is the difference between Element and Component?**

   An *Element* is a plain object describing what you want to appear on the screen in terms of the DOM nodes or other components. *Elements* can contain other *Elements* in their props. Creating a React element is cheap. Once an element is created, it is never mutated.

   The object representation of React Element would be as follows:

   ```
   const element = React.createElement(
     'div',
     {id: 'login-btn'},
     'Login'
   )
   ```

   The above `React.createElement()` function returns an object:

   ```
   {
     type: 'div',
     props: {
       children: 'Login',
       id: 'login-btn'
     }
   }
   ```

   And finally it renders to the DOM using `ReactDOM.render()`:

   ```
   Login
   ```

   Whereas a **component** can be declared in several different ways. It can be a class with a `render()` method or it can be defined as a function. In either case, it takes props as an input, and returns a JSX tree as the output:

   ```
   const Button = ({ onLogin }) =>
     <div id={'login-btn'} onClick={onLogin}>Login
   ```

   Then JSX gets transpiled to a `React.createElement()` function tree:

   ```
   const Button = ({ onLogin }) => React.createElement(
     'div',
     { id: 'login-btn', onClick: onLogin },
     'Login'
   )
   ```

⬆ Back to Top

5. **How to create components in React?**

   There are two possible ways to create a component.

   1. **Function Components:** This is the simplest way to create a component. Those are pure JavaScript functions that accept props object as the first parameter and return React elements:

      ```jsx harmony function Greeting({ message }) { return

      {`Hello, ${message}`}

      }```

   2. **Class Components:** You can also use ES6 class to define a component. The above function component can be written as:

      ```jsx harmony class Greeting extends React.Component { render() { return <h1>{`Hello, ${this.props.message}`}</h1> } }```

⬆ Back to Top

6. **When to use a Class Component over a Function Component?**

   If the component needs *state or lifecycle methods* then use class component otherwise use function component. *However, from React 16.8 with the addition of Hooks, you could use state , lifecycle methods and other features that were only available in class component right in your function component.* *So, it is always recommended to use Function components, unless you need a React functionality whose Function component equivalent is not present yet, like Error Boundaries *

⬆ Back to Top
      ```

7. **What are Pure Components?**

   React.PureComponent is exactly the same as *React.Component* except that it handles the `shouldComponentUpdate()` method for you. When props or state changes, *PureComponent* will do a shallow comparison on both props and state. *Component* on the other hand won't compare current props and state to next out of the box. Thus, the component will re-render by default whenever `shouldComponentUpdate` is called.

⬆ Back to Top

8. **What is state in React?**

   State of a component is an object that holds some information that may change over the lifetime of the component. We should always try to make our state as simple as possible and minimize the number of stateful components.

   Let's create a user component with message state,

   ```jsx harmony class User extends React.Component { constructor(props) { super(props)

```
this.state = {
  message: 'Welcome to React world'
}
```

   }

   render() { return (

# {this.state.message}

   ) } } ```

   state

   State is similar to props, but it is private and fully controlled by the component ,i.e., it is not accessible to any other component till the owner component decides to pass it.

⬆ Back to Top

9. **What are props in React?**

   *Props* are inputs to components. They are single values or objects containing a set of values that are passed to components on creation using a naming convention similar to HTML-tag attributes. They are data passed down from a parent component to a child component.

   The primary purpose of props in React is to provide following component functionality:

   1. Pass custom data to your component.
   2. Trigger state changes.
   3. Use via `this.props.reactProp` inside component's `render()` method.

   For example, let us create an element with `reactProp` property:

   ```jsx harmony

```
This `reactProp` (or whatever you came up with) name then becomes a property attached to React's native props object which ori
```

   props.reactProp ```

⬆ Back to Top

10. **What is the difference between state and props?**

    Both *props* and *state* are plain JavaScript objects. While both of them hold information that influences the output of render, they are different in their functionality with respect to component. Props get passed to the component similar to function parameters whereas state is managed within the component similar to variables declared within a function.

⬆ Back to Top

11. **Why should we not update the state directly?**

    If you try to update the state directly then it won't re-render the component.

```
//Wrong
this.state.message = 'Hello world'
```

    Instead use `setState()` method. It schedules an update to a component's state object. When state changes, the component responds by re-rendering.

```
//Correct
this.setState({ message: 'Hello World' })
```

Note: You can directly assign to the state object either in *constructor* or using latest javascript's class field declaration syntax.

⬆ Back to Top

12. ### What is the purpose of callback function as an argument of `setState()`?

    The callback function is invoked when setState finished and the component gets rendered. Since `setState()` is **asynchronous** the callback function is used for any post action.

    Note: It is recommended to use lifecycle method rather than this callback function.

    ```
    setState({ name: 'John' }, () => console.log('The name has updated and component re-rendered'))
    ```

    ⬆ Back to Top

13. ### What is the difference between HTML and React event handling?

    Below are some of the main differences between HTML and React event handling,

    1. In HTML, the event name usually represents in *lowercase* as a convention:

       ```
       <button onclick='activateLasers()'>
       ```

       Whereas in React it follows *camelCase* convention:

       ```
       jsx harmony <button onClick={activateLasers}>
       ```

    2. In HTML, you can return `false` to prevent default behavior:

       ```
       <a href='#' onclick='console.log("The link was clicked."); return false;' />
       ```

       Whereas in React you must call `preventDefault()` explicitly:

       ```
       function handleClick(event) {
         event.preventDefault()
         console.log('The link was clicked.')
       }
       ```

    3. In HTML, you need to invoke the function by appending `()` Whereas in react you should not append `()` with the function name. (refer "activateLasers" function in the first point for example)

    ⬆ Back to Top

14. ### How to bind methods or event handlers in JSX callbacks?

    There are 3 possible ways to achieve this:

    1. **Binding in Constructor:** In JavaScript classes, the methods are not bound by default. The same thing applies for React event handlers defined as class methods. Normally we bind them in constructor.

       ```
       class Foo extends Component {
         constructor(props) {
           super(props);
           this.handleClick = this.handleClick.bind(this);
         }
         handleClick() {
           console.log('Click happened');
         }
         render() {
           return <button onClick={this.handleClick}>Click Me</button>;
         }
       }
       ```

    2. **Public class fields syntax:** If you don't like to use bind approach then *public class fields syntax* can be used to correctly bind callbacks.

       ```jsx harmony handleClick = () => { console.log('this is:', this) }
       ```

```jsx harmony
<button onClick={this.handleClick}>
  {'Click me'}
</button>
```

3. **Arrow functions in callbacks:** You can use *arrow functions* directly in the callbacks.

   `jsx harmony handleClick() { console.log('Click happened'); } render() { return <button onClick={() => this.handleClick()}>Click Me</button>; }`

Note: If the callback is passed as prop to child components, those components might do an extra re-rendering. In those cases, it is preferred to go with `.bind()` or *public class fields syntax* approach considering performance.

⬆ Back to Top

15. ### How to pass a parameter to an event handler or callback?

You can use an *arrow function* to wrap around an *event handler* and pass parameters:

```jsx harmony
this.handleClick(id)} />
```

This is an equivalent to calling `.bind`:

```jsx harmony
<button onClick={this.handleClick.bind(this, id)} />
```

Apart from these two approaches, you can also pass arguments to a function which is defined as arrow function `jsx harmony <button onClick={this.handleClick(id)} /> handleClick = (id) => () => { console.log("Hello, your ticket number is", id) };`

⬆ Back to Top

16. ### What are synthetic events in React?

`SyntheticEvent` is a cross-browser wrapper around the browser's native event. Its API is same as the browser's native event, including `stopPropagation()` and `preventDefault()`, except the events work identically across all browsers.

⬆ Back to Top

17. ### What are inline conditional expressions?

You can use either *if statements* or *ternary expressions* which are available from JS to conditionally render expressions. Apart from these approaches, you can also embed any expressions in JSX by wrapping them in curly braces and then followed by JS logical operator `&&`.

`jsx harmony <h1>Hello!</h1> { messages.length > 0 && !isLogin? <h2> You have {messages.length} unread messages. </h2> : <h2> You don't have unread messages. </h2> }`

⬆ Back to Top

18. ### What is "key" prop and what is the benefit of using it in arrays of elements?

A `key` is a special string attribute you **should** include when creating arrays of elements. *Key* prop helps React identify which items have changed, are added, or are removed.

Most often we use ID from our data as *key*:

```jsx harmony const todoItems = todos.map((todo) =>
```

19. {todo.text}
)

```
When you don't have stable IDs for rendered items, you may use the item *index* as a *key* as a last resort:

```jsx harmony
const todoItems = todos.map((todo, index) =>
  <li key={index}>
    {todo.text}
  </li>
)
```

Note:
```

1. Using *indexes* for *keys* is **not recommended** if the order of items may change. This can negatively impact performance and may cause issues with component state.
2. If you extract list item as separate component then apply *keys* on list component instead of `li` tag.
3. There will be a warning message in the console if the `key` prop is not present on list items.

⬆ Back to Top

20. What is the use of refs?

The *ref* is used to return a reference to the element. They *should be avoided* in most cases, however, they can be useful when you need a direct access to the DOM element or an instance of a component.

⬆ Back to Top

21. How to create refs?

There are two approaches

1. This is a recently added approach. *Refs* are created using `React.createRef()` method and attached to React elements via the `ref` attribute. In order to use *refs* throughout the component, just assign the *ref* to the instance property within constructor.

   ```
   jsx harmony class MyComponent extends React.Component { constructor(props) { super(props) this.myRef = React.createRef() } render() { return <div ref={this.myRef} /> } }
   ```

2. You can also use ref callbacks approach regardless of React version. For example, the search bar component's input element is accessed as follows,
   ```
   jsx harmony class SearchBar extends Component { constructor(props) { super(props); this.txtSearch = null; this.state = { term: '' }; this.setInputSearchRef = e => { this.txtSearch = e; } } onInputChange(event) { this.setState({ term: this.txtSearch.value }); } render() { return ( <input value={this.state.term} onChange={this.onInputChange.bind(this)} ref={this.setInputSearchRef} /> ); } }
   ```

You can also use *refs* in function components using **closures**. **Note**: You can also use inline ref callbacks even though it is not a recommended approach.

⬆ Back to Top

22. What are forward refs?

Ref forwarding is a feature that lets some components take a *ref* they receive, and pass it further down to a child.

```jsx harmony const ButtonElement = React.forwardRef((props, ref) => ( {props.children} ));

// Create ref to the DOM button: const ref = React.createRef(); {'Forward Ref'} ```

⬆ Back to Top

### 23. Which is preferred option with in callback refs and findDOMNode()?

It is preferred to use *callback refs* over `findDOMNode()` API. Because `findDOMNode()` prevents certain improvements in React in the future.

The **legacy** approach of using `findDOMNode` :

```
class MyComponent extends Component {
  componentDidMount() {
    findDOMNode(this).scrollIntoView()
  }

  render() {
    return
  }
}
```

The recommended approach is:

```
class MyComponent extends Component {
  constructor(props){
    super(props);
    this.node = createRef();
  }
  componentDidMount() {
    this.node.current.scrollIntoView();
  }

  render() {
    return
  }
}
```
```

⬆ Back to Top

24. Why are String Refs legacy?

If you worked with React before, you might be familiar with an older API where the `ref` attribute is a string, like `ref={'textInput'}`, and the DOM node is accessed as `this.refs.textInput`. We advise against it because *string refs have below issues*, and are considered legacy. String refs were **removed in React v16**.

1. They *force React to keep track of currently executing component*. This is problematic because it makes react module stateful, and thus causes weird errors when react module is duplicated in the bundle.
2. They are *not composable* — if a library puts a ref on the passed child, the user can't put another ref on it. Callback refs are perfectly composable.
3. They *don't work with static analysis* like Flow. Flow can't guess the magic that framework does to make the string ref appear on `this.refs`, as well as its type (which could be different). Callback refs are friendlier to static analysis.
4. It doesn't work as most people would expect with the "render callback" pattern (e.g.) ```jsx harmony class MyComponent extends Component { renderRow = (index) => { // This won't work. Ref will get attached to DataTable rather than MyComponent: return ;

   // This would work though! Callback refs are awesome. return this['input-' + index] = input} />; }

   render() { return } } ```

⬆ Back to Top

25. What is Virtual DOM?

The *Virtual DOM* (VDOM) is an in-memory representation of *Real DOM*. The representation of a UI is kept in memory and synced with the "real" DOM. It's a step that happens between the render function being called and the displaying of elements on the screen. This entire process is called *reconciliation*.

⬆ Back to Top

26. How Virtual DOM works?

The *Virtual DOM* works in three simple steps.

1. Whenever any underlying data changes, the entire UI is re-rendered in Virtual DOM representation.
2. Then the difference between the previous DOM representation and the new one is calculated.
3. Once the calculations are done, the real DOM will be updated with only the things that have actually changed.

⬆ Back to Top

27. What is the difference between Shadow DOM and Virtual DOM?

The *Shadow DOM* is a browser technology designed primarily for scoping variables and CSS in *web components*. The *Virtual DOM* is a concept implemented by libraries in JavaScript on top of browser APIs.

⬆ Back to Top

28. What is React Fiber?

Fiber is the new *reconciliation* engine or reimplementation of core algorithm in React v16. The goal of React Fiber is to increase its suitability for areas like animation, layout, gestures, ability to pause, abort, or reuse work and assign priority to different types of updates; and new concurrency primitives.

⬆ Back to Top

29. What is the main goal of React Fiber?

The goal of *React Fiber* is to increase its suitability for areas like animation, layout, and gestures. Its headline feature is **incremental rendering**: the ability to split rendering work into chunks and spread it out over multiple frames.

from documentation

Its main goals are:

1. Ability to split interruptible work in chunks.
2. Ability to prioritize, rebase and reuse work in progress.
3. Ability to yield back and forth between parents and children to support layout in React.
4. Ability to return multiple elements from render().
5. Better support for error boundaries.

⬆ Back to Top

30. What are controlled components?

A component that controls the input elements within the forms on subsequent user input is called **Controlled Component**, i.e, every state mutation will have an associated handler function.

For example, to write all the names in uppercase letters, we use handleChange as below,

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

⬆ Back to Top

31. What are uncontrolled components?

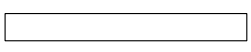
The **Uncontrolled Components** are the ones that store their own state internally, and you query the DOM using a ref to find its current value when you need it. This is a bit more like traditional HTML.

In the below UserProfile component, the `name` input is accessed using ref.

```jsx harmony class UserProfile extends React.Component { constructor(props) { super(props) this.handleSubmit = this.handleSubmit.bind(this) this.input = React.createRef() }

handleSubmit(event) { alert('A name was submitted: ' + this.input.current.value) event.preventDefault() }

render() { return (

{'Name:'}  

); } } ```

In most cases, it's recommend to use controlled components to implement forms. In a controlled component, form data is handled by a React component. The alternative is uncontrolled components, where form data is handled by the DOM itself.

⬆ Back to Top

### 32. What is the difference between createElement and cloneElement?

JSX elements will be transpiled to `React.createElement()` functions to create React elements which are going to be used for the object representation of UI. Whereas `cloneElement` is used to clone an element and pass it new props.

⬆ Back to Top

### 33. What is Lifting State Up in React?

When several components need to share the same changing data then it is recommended to *lift the shared state up* to their closest common ancestor. That means if two child components share the same data from its parent, then move the state to parent instead of maintaining local state in both of the child components.

⬆ Back to Top

### 34. What are the different phases of component lifecycle?

The component lifecycle has three distinct lifecycle phases:

1. **Mounting:** The component is ready to mount in the browser DOM. This phase covers initialization from `constructor()`, `getDerivedStateFromProps()`, `render()`, and `componentDidMount()` lifecycle methods.
2. **Updating:** In this phase, the component gets updated in two ways, sending the new props and updating the state either from `setState()` or `forceUpdate()`. This phase covers `getDerivedStateFromProps()`, `shouldComponentUpdate()`, `render()`, `getSnapshotBeforeUpdate()` and `componentDidUpdate()` lifecycle methods.
3. **Unmounting:** In this last phase, the component is not needed and gets unmounted from the browser DOM. This phase includes `componentWillUnmount()` lifecycle method.

It's worth mentioning that React internally has a concept of phases when applying changes to the DOM. They are separated as follows

1. **Render** The component will render without any side effects. This applies to Pure components and in this phase, React can pause, abort, or restart the render.
2. **Pre-commit** Before the component actually applies the changes to the DOM, there is a moment that allows React to read from the DOM through the `getSnapshotBeforeUpdate()`.
3. **Commit** React works with the DOM and executes the final lifecycles respectively `componentDidMount()` for mounting, `componentDidUpdate()` for updating, and `componentWillUnmount()` for unmounting.

React 16.3+ Phases (or an interactive version)



Before React 16.3

⬆ Back to Top

### 35. What are the lifecycle methods of React?
```

Before React 16.3

- **componentWillMount:** Executed before rendering and is used for App level configuration in your root component.
- **componentDidMount:** Executed after first rendering and here all AJAX requests, DOM or state updates, and set up event listeners should occur.
- **componentWillReceiveProps:** Executed when particular prop updates to trigger state transitions.
- **shouldComponentUpdate:** Determines if the component will be updated or not. By default it returns `true`. If you are sure that the component doesn't need to render after state or props are updated, you can return false value. It is a great place to improve performance as it allows you to prevent a re-render if component receives new prop.
- **componentWillUpdate:** Executed before re-rendering the component when there are props & state changes confirmed by `shouldComponentUpdate()` which returns true.
- **componentDidUpdate:** Mostly it is used to update the DOM in response to prop or state changes.
- **componentWillUnmount:** It will be used to cancel any outgoing network requests, or remove all event listeners associated with the component.

React 16.3+

- **getDerivedStateFromProps:** Invoked right before calling `render()` and is invoked on *every* render. This exists for rare use cases where you need a derived state. Worth reading if you need derived state.
- **componentDidMount:** Executed after first rendering and where all AJAX requests, DOM or state updates, and set up event listeners should occur.
- **shouldComponentUpdate:** Determines if the component will be updated or not. By default, it returns `true`. If you are sure that the component doesn't need to render after the state or props are updated, you can return a false value. It is a great place to improve performance as it allows you to prevent a re-render if component receives a new prop.
- **getSnapshotBeforeUpdate:** Executed right before rendered output is committed to the DOM. Any value returned by this will be passed into `componentDidUpdate()`. This is useful to capture information from the DOM i.e. scroll position.
- **componentDidUpdate:** Mostly it is used to update the DOM in response to prop or state changes. This will not fire if `shouldComponentUpdate()` returns `false`.
- **componentWillUnmount** It will be used to cancel any outgoing network requests, or remove all event listeners associated with the component.

⬆ Back to Top

36. What are Higher-Order Components?

A *higher-order component* (*HOC*) is a function that takes a component and returns a new component. Basically, it's a pattern that is derived from React's compositional nature.

We call them **pure components** because they can accept any dynamically provided child component but they won't modify or copy any behavior from their input components.

```
const EnhancedComponent = higherOrderComponent(WrappedComponent)
```

HOC can be used for many use cases:

1. Code reuse, logic and bootstrap abstraction.
2. Render hijacking.
3. State abstraction and manipulation.
4. Props manipulation.

⬆ Back to Top

37. How to create props proxy for HOC component?

You can add/edit props passed to the component using *props proxy* pattern like this:

```jsx harmony function HOC(WrappedComponent) { return class Test extends Component { render() { const newProps = { title: 'New Header', footer: false, showFeatureX: false, showFeatureY: true }

```
  return <WrappedComponent {...this.props} {...newProps} />
}
```

}}```

⬆ Back to Top

### 38. What is context?

*Context* provides a way to pass data through the component tree without having to pass props down manually at every level.

For example, authenticated users, locale preferences, UI themes need to be accessed in the application by many components.

```
const {Provider, Consumer} = React.createContext(defaultValue)
```

⬆ Back to Top

39. What is children prop?

Children is a prop (`this.props.children`) that allows you to pass components as data to other components, just like any other prop you use. Component tree put between component's opening and closing tag will be passed to that component as `children` prop.

There are several methods available in the React API to work with this prop. These include `React.Children.map`, `React.Children.forEach`, `React.Children.count`, `React.Children.only`, `React.Children.toArray`.

A simple usage of children prop looks as below,
```

```jsx harmony const MyDiv = React.createClass({ render: function() { return

{this.props.children}
} })

ReactDOM.render( {'Hello'} {'World'} , node ) ```

⬆ Back to Top

40. ### How to write comments in React?

The comments in React/JSX are similar to JavaScript Multiline comments but are wrapped in curly braces.

**Single-line comments:**

```jsx harmony

{/* Single-line comments(In vanilla JavaScript, the single-line comments are represented by double slash(//)) */} { `Welcome ${user}, let's play React` }

**Multi-line comments:**

```jsx harmony
<div>
  {/* Multi-line comments for more than
   one line */}
  {`Welcome ${user}, let's play React`}
</div>
```

⬆ Back to Top

41. ### What is the purpose of using super constructor with props argument?

A child class constructor cannot make use of `this` reference until the `super()` method has been called. The same applies to ES6 sub-classes as well. The main reason for passing props parameter to `super()` call is to access `this.props` in your child constructors.

Passing props:

```
class MyComponent extends React.Component {
  constructor(props) {
    super(props)

    console.log(this.props) // prints { name: 'John', age: 42 }
  }
}
```

Not passing props:

```
class MyComponent extends React.Component {
  constructor(props) {
    super()

    console.log(this.props) // prints undefined

    // but props parameter is still available
    console.log(props) // prints { name: 'John', age: 42 }
  }

  render() {
    // no difference outside constructor
    console.log(this.props) // prints { name: 'John', age: 42 }
  }
}
```

The above code snippets reveals that `this.props` is different only within the constructor. It would be the same outside the constructor.

⬆ Back to Top

42. ### What is reconciliation?

When a component's props or state change, React decides whether an actual DOM update is necessary by comparing the newly returned element with the previously rendered one. When they are not equal, React will update the DOM. This process is called *reconciliation*.

⬆ Back to Top

43. How to set state with a dynamic key name?

If you are using ES6 or the Babel transpiler to transform your JSX code then you can accomplish this with *computed property names*.

```
handleInputChange(event) {
  this.setState({ [event.target.id]: event.target.value })
}
```

⬆ Back to Top

44. What would be the common mistake of function being called every time the component renders?

You need to make sure that function is not being called while passing the function as a parameter.

```jsx harmony render() { // Wrong: handleClick is called instead of passed as a reference! return <button onClick={this.handleClick()}>{'Click Me'}</button> }
```

Instead, pass the function itself without parenthesis:

```jsx harmony
render() {
  // Correct: handleClick is passed as a reference!
  return <button onClick={this.handleClick}>{'Click Me'}</button>
}
```

⬆ Back to Top

45. Is lazy function supports named exports?

No, currently `React.lazy` function supports default exports only. If you would like to import modules which are named exports, you can create an intermediate module that reexports it as the default. It also ensures that tree shaking keeps working and don't pull unused components. Let's take a component file which exports multiple named components,

```
// MoreComponents.js
export const SomeComponent = /* ... */;
export const UnusedComponent = /* ... */;
```

and reexport `MoreComponents.js` components in an intermediate file `IntermediateComponent.js`

```
// IntermediateComponent.js
export { SomeComponent as default } from "./MoreComponents.js";
```

Now you can import the module using lazy function as below,

```
import React, { lazy } from 'react';
const SomeComponent = lazy(() => import("./IntermediateComponent.js"));
```

⬆ Back to Top

46. Why React uses `className` over `class` attribute?

`class` is a keyword in JavaScript, and JSX is an extension of JavaScript. That's the principal reason why React uses `className` instead of `class`. Pass a string as the `className` prop.

```
jsx harmony render() { return <span className={'menu navigation-menu'}>{'Menu'}</span> }
```

⬆ Back to Top

47. What are fragments?

It's a common pattern in React which is used for a component to return multiple elements. *Fragments* let you group a list of children without adding extra nodes to the DOM.

```jsx harmony render() { return ( <React.Fragment> </React.Fragment> ) }
```

```
There is also a *shorter syntax*, but it's not supported in many tools:

```jsx harmony
render() {
  return (
    <>
      <ChildA />
      <ChildB />
      <ChildC />
    </>
  )
}
```

⬆ Back to Top

48. Why fragments are better than container divs?

Below are the list of reasons,

1. Fragments are a bit faster and use less memory by not creating an extra DOM node. This only has a real benefit on very large and deep trees.
2. Some CSS mechanisms like *Flexbox* and *CSS Grid* have a special parent-child relationships, and adding divs in the middle makes it hard to keep the desired layout.
3. The DOM Inspector is less cluttered.

⬆ Back to Top

49. What are portals in React?

Portal is a recommended way to render children into a DOM node that exists outside the DOM hierarchy of the parent component.

```
ReactDOM.createPortal(child, container)
```

The first argument is any render-able React child, such as an element, string, or fragment. The second argument is a DOM element.

⬆ Back to Top

50. What are stateless components?

If the behaviour is independent of its state then it can be a stateless component. You can use either a function or a class for creating stateless components. But unless you need to use a lifecycle hook in your components, you should go for function components. There are a lot of benefits if you decide to use function components here; they are easy to write, understand, and test, a little faster, and you can avoid the `this` keyword altogether.

⬆ Back to Top

51. What are stateful components?

If the behaviour of a component is dependent on the *state* of the component then it can be termed as stateful component. These *stateful components* are always *class components* and have a state that gets initialized in the `constructor`.

```
class App extends Component {
  constructor(props) {
    super(props)
    this.state = { count: 0 }
  }

  render() {
    // ...
  }
}
```

React 16.8 Update:

Hooks let you use state and other React features without writing classes.

The Equivalent Functional Component

```javascript import React, {useState} from 'react';

```
const App = (props) => {
  const [count, setCount] = useState(0);

  return (
    // JSX
)
}
```

```

⬆ Back to Top

52. ## How to apply validation on props in React?

When the application is running in *development mode*, React will automatically check all props that we set on components to make sure they have *correct type*. If the type is incorrect, React will generate warning messages in the console. It's disabled in *production mode* due to performance impact. The mandatory props are defined with `isRequired`.

The set of predefined prop types:

1. `PropTypes.number`
2. `PropTypes.string`
3. `PropTypes.array`
4. `PropTypes.object`
5. `PropTypes.func`
6. `PropTypes.node`
7. `PropTypes.element`
8. `PropTypes.bool`
9. `PropTypes.symbol`
10. `PropTypes.any`

We can define `propTypes` for `User` component as below:

```jsx harmony import React from 'react' import PropTypes from 'prop-types'

class User extends React.Component { static propTypes = { name: PropTypes.string.isRequired, age: PropTypes.number.isRequired }

render() { return ( <>

{`Welcome, ${this.props.name}`}

{`Age, ${this.props.age}`}

</>)}}

```
Note: In React v15.5 *PropTypes* were moved from `React.PropTypes` to `prop-types` library.

The Equivalent Functional Component

```jsx harmony
import React from 'react'
import PropTypes from 'prop-types'

function User({name, age}) {
  return (
    <>
      <h1>{`Welcome, ${name}`}</h1>
      <h2>{`Age, ${age}`}</h2>
    </>
  )
}

User.propTypes = {
    name: PropTypes.string.isRequired,
    age: PropTypes.number.isRequired
  }
```

⬆ Back to Top

53. ## What are the advantages of React?

Below are the list of main advantages of React,
```

1. Increases the application's performance with *Virtual DOM*.
2. JSX makes code easy to read and write.
3. It renders both on client and server side (*SSR*).
4. Easy to integrate with frameworks (Angular, Backbone) since it is only a view library.
5. Easy to write unit and integration tests with tools such as Jest.

⬆ Back to Top

54. What are the limitations of React?

Apart from the advantages, there are few limitations of React too,

1. React is just a view library, not a full framework.
2. There is a learning curve for beginners who are new to web development.
3. Integrating React into a traditional MVC framework requires some additional configuration.
4. The code complexity increases with inline templating and JSX.
5. Too many smaller components leading to over engineering or boilerplate.

⬆ Back to Top

55. What are error boundaries in React v16?

Error boundaries are components that catch JavaScript errors anywhere in their child component tree, log those errors, and display a fallback UI instead of the component tree that crashed.

A class component becomes an error boundary if it defines a new lifecycle method called `componentDidCatch(error, info)` or `static getDerivedStateFromError()`:

```jsx harmony class ErrorBoundary extends React.Component { constructor(props) { super(props) this.state = { hasError: false } }

componentDidCatch(error, info) { // You can also log the error to an error reporting service logErrorToMyService(error, info) }

static getDerivedStateFromError(error) { // Update state so the next render will show the fallback UI. return { hasError: true }; }

render() { if (this.state.hasError) { // You can render any custom fallback UI return

# {'Something went wrong.'}

} return this.props.children } }

```
After that use it as a regular component:

```jsx harmony
<ErrorBoundary>
  <MyWidget />
</ErrorBoundary>
```

⬆ Back to Top

56. How error boundaries handled in React v15?

React v15 provided very basic support for *error boundaries* using `unstable_handleError` method. It has been renamed to `componentDidCatch` in React v16.

⬆ Back to Top

57. What are the recommended ways for static type checking?

Normally we use *PropTypes library* (`React.PropTypes` moved to a `prop-types` package since React v15.5) for *type checking* in the React applications. For large code bases, it is recommended to use *static type checkers* such as Flow or TypeScript, that perform type checking at compile time and provide auto-completion features.

⬆ Back to Top

58. What is the use of `react-dom` package?

The `react-dom` package provides *DOM-specific methods* that can be used at the top level of your app. Most of the components are not required to use this module. Some of the methods of this package are:

1. `render()`
2. `hydrate()`
3. `unmountComponentAtNode()`
4. `findDOMNode()`
5. `createPortal()`

⬆ Back to Top

59. What is the purpose of render method of `react-dom`?

This method is used to render a React element into the DOM in the supplied container and return a reference to the component. If the React element was previously rendered into container, it will perform an update on it and only mutate the DOM as necessary to reflect the latest changes.

```
ReactDOM.render(element, container[, callback])
```

If the optional callback is provided, it will be executed after the component is rendered or updated.

⬆ Back to Top

60. What is ReactDOMServer?

The `ReactDOMServer` object enables you to render components to static markup (typically used on node server). This object is mainly used for *server-side rendering* (SSR). The following methods can be used in both the server and browser environments:

1. `renderToString()`
2. `renderToStaticMarkup()`

For example, you generally run a Node-based web server like Express, Hapi, or Koa, and you call `renderToString` to render your root component to a string, which you then send as response.

```
// using Express
import { renderToString } from 'react-dom/server'
import MyPage from './MyPage'

app.get('/', (req, res) => {
  res.write('<!DOCTYPE html><html><head><title>My Page</title></head><body>')
  res.write('<div id="content">')
  res.write(renderToString(<MyPage/>))
  res.write('</div></body></html>')
  res.end()
})
```

⬆ Back to Top

61. How to use innerHTML in React?

The `dangerouslySetInnerHTML` attribute is React's replacement for using `innerHTML` in the browser DOM. Just like `innerHTML`, it is risky to use this attribute considering cross-site scripting (XSS) attacks. You just need to pass a `__html` object as key and HTML text as value.

In this example MyComponent uses `dangerouslySetInnerHTML` attribute for setting HTML markup:

```jsx harmony function createMarkup() { return { __html: 'First · Second' } }

function MyComponent() { return

} ```

⬆ Back to Top

### 62. How to use styles in React?

The `style` attribute accepts a JavaScript object with camelCased properties rather than a CSS string. This is consistent with the DOM style JavaScript property, is more efficient, and prevents XSS security holes.

```jsx harmony const divStyle = { color: 'blue', backgroundImage: 'url(' + imgUrl + ')' };

function HelloWorldComponent() { return

Hello World!
} ```

Style keys are camelCased in order to be consistent with accessing the properties on DOM nodes in JavaScript (e.g. `node.style.backgroundImage`).

⬆ Back to Top

### 63. How events are different in React?

Handling events in React elements has some syntactic differences:

1. React event handlers are named using camelCase, rather than lowercase.
2. With JSX you pass a function as the event handler, rather than a string.

⬆ Back to Top

### 64. What will happen if you use `setState()` in constructor?

When you use `setState()`, then apart from assigning to the object state React also re-renders the component and all its children. You would get error like this: *Can only update a mounted or mounting component.* So we need to use `this.state` to initialize variables inside constructor.

⬆ Back to Top

### 65. What is the impact of indexes as keys?

Keys should be stable, predictable, and unique so that React can keep track of elements.

In the below code snippet each element's key will be based on ordering, rather than tied to the data that is being represented. This limits the optimizations that React can do.

```jsx harmony {todos.map((todo, index) => )}
```

```
If you use element data for unique key, assuming todo.id is unique to this list and stable, React would be able to reorder ele

```jsx harmony
{todos.map((todo) =>
  <Todo {...todo}
    key={todo.id} />
)}
```

⬆ Back to Top

66. Is it good to use `setState()` in `componentWillMount()` method?

Yes, it is safe to use `setState()` inside `componentWillMount()` method. But at the same it is recommended to avoid async initialization in `componentWillMount()` lifecycle method. `componentWillMount()` is invoked immediately before mounting occurs. It is called before `render()`, therefore setting state in this method will not trigger a re-render. Avoid introducing any side-effects or subscriptions in this method. We need to make sure async calls for component initialization happened in `componentDidMount()` instead of `componentWillMount()`.

```
jsx harmony componentDidMount() { axios.get(`api/todos`) .then((result) => { this.setState({ messages: [...result.data] }) })
}
```

⬆ Back to Top

67. What will happen if you use props in initial state?

If the props on the component are changed without the component being refreshed, the new prop value will never be displayed because the constructor function will never update the current state of the component. The initialization of state from props only runs when the component is first created.

The below component won't display the updated input value:

```jsx harmony class MyComponent extends React.Component { constructor(props) { super(props)
```

```
this.state = {
  records: [],
  inputValue: this.props.inputValue
};
```

}

render() { return

{this.state.inputValue}
} }

```
Using props inside render method will update the value:

```jsx harmony
class MyComponent extends React.Component {
  constructor(props) {
    super(props)

    this.state = {
      record: []
    }
  }

  render() {
    return <div>{this.props.inputValue}</div>
  }
}
```

⬆ Back to Top

68. How do you conditionally render components?

In some cases you want to render different components depending on some state. JSX does not render `false` or `undefined`, so you can use conditional *short-circuiting* to render a given part of your component only if a certain condition is true.

```jsx harmony const MyComponent = ({ name, address }) => (

## {name}

{address &&

{address}

}
)
```

If you need an `if-else` condition then use *ternary operator*.

```jsx harmony
const MyComponent = ({ name, address }) => (
  <div>
    <h2>{name}</h2>
    {address
      ? <p>{address}</p>
      : <p>{'Address is not available'}</p>
    }
  </div>
)
```

⬆ Back to Top

69. Why we need to be careful when spreading props on DOM elements?

When we *spread props* we run into the risk of adding unknown HTML attributes, which is a bad practice. Instead we can use prop destructuring with `...rest` operator, so it will add only required props.

For example,

```jsx harmony const ComponentA = () =>

const ComponentB = ({ isDisplay, ...domProps }) =>

{'ComponentB'}
```

⬆ Back to Top

70. How you use decorators in React?

You can *decorate* your *class* components, which is the same as passing the component into a function. **Decorators** are flexible and readable way of modifying component functionality.

```jsx harmony @setTitle('Profile') class Profile extends React.Component { //.... }

/* title is a string that will be set as a document title WrappedComponent is what our decorator will receive when put directly above a component class as seen in the example above */ const setTitle = (title) => (WrappedComponent) => { return class extends React.Component { componentDidMount() { document.title = title }

render() {
  return <WrappedComponent {...this.props} />
}
```

}}```

Note: Decorators are a feature that didn't make it into ES7, but are currently a *stage 2 proposal*.

⬆ Back to Top

71. How do you memoize a component?

There are memoize libraries available which can be used on function components.

For example `moize` library can memoize the component in another component.

```jsx harmony import moize from 'moize' import Component from './components/Component' // this module exports a non-memoized component

const MemoizedFoo = moize.react(Component)

const Consumer = () => {
```

{'I will memoize the following entry:'}
}

```
**Update:** Since React v16.6.0, we have a `React.memo`. It provides a higher order component which memoizes component unless

```js
  const MemoComponent = React.memo(function MemoComponent(props) {
    /* render using props */
  });
  OR
  export default React.memo(MyFunctionComponent);
```

⬆ Back to Top

72. ### How you implement Server Side Rendering or SSR?

React is already equipped to handle rendering on Node servers. A special version of the DOM renderer is available, which follows the same pattern as on the client side.

```jsx harmony import ReactDOMServer from 'react-dom/server' import App from './App'

ReactDOMServer.renderToString() ```

This method will output the regular HTML as a string, which can be then placed inside a page body as part of the server response. On the client side, React detects the pre-rendered content and seamlessly picks up where it left off.

⬆ Back to Top

73. ### How to enable production mode in React?

You should use Webpack's `DefinePlugin` method to set `NODE_ENV` to `production`, by which it strip out things like propType validation and extra warnings. Apart from this, if you minify the code, for example, Uglify's dead-code elimination to strip out development only code and comments, it will drastically reduce the size of your bundle.

⬆ Back to Top

74. ### What is CRA and its benefits?

The `create-react-app` CLI tool allows you to quickly create & run React applications with no configuration step.

Let's create Todo App using *CRA*:

```
 # Installation
$ npm install -g create-react-app

# Create new project
$ create-react-app todo-app
$ cd todo-app

# Build, test and run
$ npm run build
$ npm run test
$ npm start
```

It includes everything we need to build a React app:

1. React, JSX, ES6, and Flow syntax support.
2. Language extras beyond ES6 like the object spread operator.
3. Autoprefixed CSS, so you don't need -webkit- or other prefixes.
4. A fast interactive unit test runner with built-in support for coverage reporting.
5. A live development server that warns about common mistakes.
6. A build script to bundle JS, CSS, and images for production, with hashes and sourcemaps.

⬆ Back to Top

75. ### What is the lifecycle methods order in mounting?

The lifecycle methods are called in the following order when an instance of a component is being created and inserted into the DOM.

1. `constructor()`
2. `static getDerivedStateFromProps()`
3. `render()`
4. `componentDidMount()`

⬆ Back to Top

76. What are the lifecycle methods going to be deprecated in React v16?

The following lifecycle methods going to be unsafe coding practices and will be more problematic with async rendering.

1. `componentWillMount()`
2. `componentWillReceiveProps()`
3. `componentWillUpdate()`

Starting with React v16.3 these methods are aliased with `UNSAFE_` prefix, and the unprefixed version will be removed in React v17.

⬆ Back to Top

77. What is the purpose of `getDerivedStateFromProps()` lifecycle method?

The new static `getDerivedStateFromProps()` lifecycle method is invoked after a component is instantiated as well as before it is re-rendered. It can return an object to update state, or `null` to indicate that the new props do not require any state updates.

```
class MyComponent extends React.Component {
  static getDerivedStateFromProps(props, state) {
    // ...
  }
}
```

This lifecycle method along with `componentDidUpdate()` covers all the use cases of `componentWillReceiveProps()`.

⬆ Back to Top

78. What is the purpose of `getSnapshotBeforeUpdate()` lifecycle method?

The new `getSnapshotBeforeUpdate()` lifecycle method is called right before DOM updates. The return value from this method will be passed as the third parameter to `componentDidUpdate()`.

```
class MyComponent extends React.Component {
  getSnapshotBeforeUpdate(prevProps, prevState) {
    // ...
  }
}
```

This lifecycle method along with `componentDidUpdate()` covers all the use cases of `componentWillUpdate()`.

⬆ Back to Top

79. Do Hooks replace render props and higher order components?

Both render props and higher-order components render only a single child but in most of the cases Hooks are a simpler way to serve this by reducing nesting in your tree.

⬆ Back to Top

80. What is the recommended way for naming components?

It is recommended to name the component by reference instead of using `displayName`.

Using `displayName` for naming component:

```
export default React.createClass({
  displayName: 'TodoApp',
  // ...
})
```

The **recommended** approach:

```
export default class TodoApp extends React.Component {
  // ...
}
```

also

```
const TodoApp = () => {
 //...
}
export default TodoApp;
```

⬆ Back to Top

81. What is the recommended ordering of methods in component class?

Recommended ordering of methods from *mounting* to *render stage*:

1. `static` methods
2. `constructor()`
3. `getChildContext()`
4. `componentWillMount()`
5. `componentDidMount()`
6. `componentWillReceiveProps()`
7. `shouldComponentUpdate()`
8. `componentWillUpdate()`
9. `componentDidUpdate()`
10. `componentWillUnmount()`
11. click handlers or event handlers like `onClickSubmit()` or `onChangeDescription()`
12. getter methods for render like `getSelectReason()` or `getFooterContent()`
13. optional render methods like `renderNavigation()` or `renderProfilePicture()`
14. `render()`

⬆ Back to Top

82. What is a switching component?

A *switching component* is a component that renders one of many components. We need to use object to map prop values to components.

For example, a switching component to display different pages based on `page` prop:

```jsx harmony import HomePage from './HomePage' import AboutPage from './AboutPage' import ServicesPage from './ServicesPage' import ContactPage from './ContactPage'

const PAGES = { home: HomePage, about: AboutPage, services: ServicesPage, contact: ContactPage }

const Page = (props) => { const Handler = PAGES[props.page] || ContactPage

return }

// The keys of the PAGES object can be used in the prop types to catch dev-time errors. Page.propTypes = { page: PropTypes.oneOf(Object.keys(PAGES)).isRequired } ```

⬆ Back to Top

### 83. Why we need to pass a function to setState()?

The reason behind for this is that `setState()` is an asynchronous operation. React batches state changes for performance reasons, so the state may not change immediately after `setState()` is called. That means you should not rely on the current state when calling `setState()` since you can't be sure what that state will be. The solution is to pass a function to `setState()`, with the previous state as an argument. By doing this you can avoid issues with the user getting the old state value on access due to the asynchronous nature of `setState()`.

Let's say the initial count value is zero. After three consecutive increment operations, the value is going to be incremented only by one.

```
// assuming this.state.count === 0
this.setState({ count: this.state.count + 1 })
this.setState({ count: this.state.count + 1 })
this.setState({ count: this.state.count + 1 })
// this.state.count === 1, not 3
```

If we pass a function to `setState()`, the count gets incremented correctly.

```
this.setState((prevState, props) => ({
  count: prevState.count + props.increment
}))
// this.state.count === 3 as expected
```

(OR)

Why function is preferred over object for `setState()`?

React may batch multiple `setState()` calls into a single update for performance. Because `this.props` and `this.state` may be updated asynchronously, you should not rely on their values for calculating the next state.

This counter example will fail to update as expected:

`javascript // Wrong this.setState({ counter: this.state.counter + this.props.increment, })`

The preferred approach is to call `setState()` with function rather than object. That function will receive the previous state as the first argument, and the props at the time the update is applied as the second argument.
```

```javascript // Correct this.setState((prevState, props) => ({ counter: prevState.counter + props.increment }))```

⬆ Back to Top

84. What is strict mode in React?

`React.StrictMode` is a useful component for highlighting potential problems in an application. Just like `<Fragment>`, `<StrictMode>` does not render any extra DOM elements. It activates additional checks and warnings for its descendants. These checks apply for *development mode* only.

```jsx harmony import React from 'react'

function ExampleApplication() { return (

<React.StrictMode>
</React.StrictMode>
) }```

In the example above, the *strict mode* checks apply to `<ComponentOne>` and `<ComponentTwo>` components only.

⬆ Back to Top

### 85. What are React Mixins?

*Mixins* are a way to totally separate components to have a common functionality. Mixins **should not be used** and can be replaced with *higher-order components* or *decorators*.

One of the most commonly used mixins is `PureRenderMixin`. You might be using it in some components to prevent unnecessary re-renders when the props and state are shallowly equal to the previous props and state:

```
const PureRenderMixin = require('react-addons-pure-render-mixin')

const Button = React.createClass({
  mixins: [PureRenderMixin],
  // ...
})
```

⬆ Back to Top

86. Why is `isMounted()` an anti-pattern and what is the proper solution?

The primary use case for `isMounted()` is to avoid calling `setState()` after a component has been unmounted, because it will emit a warning.

```
if (this.isMounted()) {
  this.setState({...})
}
```

Checking `isMounted()` before calling `setState()` does eliminate the warning, but it also defeats the purpose of the warning. Using `isMounted()` is a code smell because the only reason you would check is because you think you might be holding a reference after the component has unmounted.

An optimal solution would be to find places where `setState()` might be called after a component has unmounted, and fix them. Such situations most commonly occur due to callbacks, when a component is waiting for some data and gets unmounted before the data arrives. Ideally, any callbacks should be canceled in `componentWillUnmount()`, prior to unmounting.

⬆ Back to Top

87. What are the Pointer Events supported in React?

Pointer Events provide a unified way of handling all input events. In the old days we had a mouse and respective event listeners to handle them but nowadays we have many devices which don't correlate to having a mouse, like phones with touch surface or pens. We need to remember that these events will only work in browsers that support the *Pointer Events* specification.

The following event types are now available in *React DOM*:

1. `onPointerDown`
2. `onPointerMove`
3. `onPointerUp`
4. `onPointerCancel`
5. `onGotPointerCapture`
6. `onLostPointerCapture`
7. `onPointerEnter`
8. `onPointerLeave`
9. `onPointerOver`
10. `onPointerOut`

⬆ Back to Top

88. Why should component names start with capital letter?

If you are rendering your component using JSX, the name of that component has to begin with a capital letter otherwise React will throw an error as an unrecognized tag. This convention is because only HTML elements and SVG tags can begin with a lowercase letter. ```jsx harmony class SomeComponent extends Component { // Code goes here }

```
You can define component class which name starts with lowercase letter, but when it's imported it should have capital letter.

```jsx harmony
class myComponent extends Component {
  render() {
    return <div />
  }
}

export default myComponent
```

While when imported in another file it should start with capital letter:

```jsx harmony import MyComponent from './MyComponent'

```
What are the exceptions on React component naming?

The component names should start with an uppercase letter but there are few exceptions to this convention. The lowercase tag n
For example, the below tag can be compiled to a valid component,

```jsx harmony
     render() {
          return (
            <obj.component/> // `React.createElement(obj.component)`
          )
    }
```

⬆ Back to Top

89. ### Are custom DOM attributes supported in React v16?

Yes. In the past, React used to ignore unknown DOM attributes. If you wrote JSX with an attribute that React doesn't recognize, React would just skip it.

For example, let's take a look at the below attribute:

```jsx harmony
```
Would render an empty div to the DOM with React v15:

```html
<div />
```

In React v16 any unknown attributes will end up in the DOM:

```
<div mycustomattribute='something' />
```

This is useful for supplying browser-specific non-standard attributes, trying new DOM APIs, and integrating with opinionated third-party libraries.

⬆ Back to Top

90. ### What is the difference between constructor and getInitialState?

You should initialize state in the constructor when using ES6 classes, and `getInitialState()` method when using `React.createClass()`.

Using ES6 classes:

```
class MyComponent extends React.Component {
  constructor(props) {
    super(props)
    this.state = { /* initial state */ }
  }
}
```
```

Using `React.createClass()`:

```
const MyComponent = React.createClass({
  getInitialState() {
    return { /* initial state */ }
  }
})
```

Note: `React.createClass()` is deprecated and removed in React v16. Use plain JavaScript classes instead.

⬆ Back to Top

91. ### Can you force a component to re-render without calling setState?

By default, when your component's state or props change, your component will re-render. If your `render()` method depends on some other data, you can tell React that the component needs re-rendering by calling `forceUpdate()`.

```
component.forceUpdate(callback)
```

It is recommended to avoid all uses of `forceUpdate()` and only read from `this.props` and `this.state` in `render()`.

⬆ Back to Top

92. ### What is the difference between `super()` and `super(props)` in React using ES6 classes?

When you want to access `this.props` in `constructor()` then you should pass props to `super()` method.

Using `super(props)`:

```
class MyComponent extends React.Component {
  constructor(props) {
    super(props)
    console.log(this.props) // { name: 'John', ... }
  }
}
```

Using `super()`:

```
class MyComponent extends React.Component {
  constructor(props) {
    super()
    console.log(this.props) // undefined
  }
}
```

Outside `constructor()` both will display same value for `this.props`.

⬆ Back to Top

93. ### How to loop inside JSX?

You can simply use `Array.prototype.map` with ES6 *arrow function* syntax.

For example, the `items` array of objects is mapped into an array of components:

```jsx harmony {items.map(item => )}

But you can't iterate using `for` loop:

```jsx harmony
<tbody>
  for (let i = 0; i < items.length; i++) {
    <SomeComponent key={items[i].id} name={items[i].name} />
  }
</tbody>
```

This is because JSX tags are transpiled into *function calls*, and you can't use statements inside expressions. This may change thanks to `do` expressions which are *stage 1 proposal*.

⬆ Back to Top
```

94. How do you access props in attribute quotes?

React (or JSX) doesn't support variable interpolation inside an attribute value. The below representation won't work:

```jsx harmony

```
But you can put any JS expression inside curly braces as the entire attribute value. So the below expression works:

```jsx harmony
<img className='image' src={'images/' + this.props.image} />
```

Using *template strings* will also work:

```
jsx harmony <img className='image' src={`images/${this.props.image}`} />
```

⬆ Back to Top

95. What is React proptype array with shape?

If you want to pass an array of objects to a component with a particular shape then use `React.PropTypes.shape()` as an argument to `React.PropTypes.arrayOf()`.

```
ReactComponent.propTypes = {
  arrayWithShape: React.PropTypes.arrayOf(React.PropTypes.shape({
    color: React.PropTypes.string.isRequired,
    fontSize: React.PropTypes.number.isRequired
  })).isRequired
}
```

⬆ Back to Top

96. How to conditionally apply class attributes?

You shouldn't use curly braces inside quotes because it is going to be evaluated as a string.

```jsx harmony

```
Instead you need to move curly braces outside (don't forget to include spaces between class names):

```jsx harmony
<div className={'btn-panel ' + (this.props.visible ? 'show' : 'hidden')}>
```

Template strings will also work:

```
jsx harmony <div className={`btn-panel ${this.props.visible ? 'show' : 'hidden'}`}>
```

⬆ Back to Top

97. What is the difference between React and ReactDOM?

The `react` package contains `React.createElement()`, `React.Component`, `React.Children`, and other helpers related to elements and component classes. You can think of these as the isomorphic or universal helpers that you need to build components. The `react-dom` package contains `ReactDOM.render()`, and in `react-dom/server` we have *server-side rendering* support with `ReactDOMServer.renderToString()` and `ReactDOMServer.renderToStaticMarkup()`.

⬆ Back to Top

98. Why ReactDOM is separated from React?

The React team worked on extracting all DOM-related features into a separate library called *ReactDOM*. React v0.14 is the first release in which the libraries are split. By looking at some of the packages, `react-native`, `react-art`, `react-canvas`, and `react-three`, it has become clear that the beauty and essence of React has nothing to do with browsers or the DOM.

To build more environments that React can render to, React team planned to split the main React package into two: `react` and `react-dom`. This paves the way to writing components that can be shared between the web version of React and React Native.

⬆ Back to Top

99. How to use React label element?

If you try to render a `<label>` element bound to a text input using the standard `for` attribute, then it produces HTML missing that attribute and prints a warning to the console.

```jsx harmony {'User'} 
```

Since `for` is a reserved keyword in JavaScript, use `htmlFor` instead.

```jsx harmony
<label htmlFor={'user'}>{'User'}</label>
<input type={'text'} id={'user'} />
```

⬆ Back to Top

100. ### How to combine multiple inline style objects?

You can use *spread operator* in regular React:

```jsx harmony <button style={{...styles.panel.button, ...styles.panel.submitButton}}>{'Submit'}</button>
```

If you're using React Native then you can use the array notation:

```jsx harmony
<button style={[styles.panel.button, styles.panel.submitButton]}>{'Submit'}</button>
```

⬆ Back to Top

101. ### How to re-render the view when the browser is resized?

You can listen to the `resize` event in `componentDidMount()` and then update the dimensions (`width` and `height`). You should remove the listener in `componentWillUnmount()` method.

```javascript class WindowDimensions extends React.Component { constructor(props){ super(props); this.updateDimensions = this.updateDimensions.bind(this); }

componentWillMount() { this.updateDimensions() }

componentDidMount() { window.addEventListener('resize', this.updateDimensions) }

componentWillUnmount() { window.removeEventListener('resize', this.updateDimensions) }

updateDimensions() { this.setState({width: window.innerWidth, height: window.innerHeight}) }

render() { return {this.state.width} x {this.state.height} } } ```

⬆ Back to Top

102. ### What is the difference between `setState()` and `replaceState()` methods?

When you use `setState()` the current and previous states are merged. `replaceState()` throws out the current state, and replaces it with only what you provide. Usually `setState()` is used unless you really need to remove all previous keys for some reason. You can also set state to `false` / `null` in `setState()` instead of using `replaceState()`.

⬆ Back to Top

103. ### How to listen to state changes?

The `componentDidUpdate` lifecycle method will be called when state changes. You can compare provided state and props values with current state and props to determine if something meaningful changed.

```
componentDidUpdate(object prevProps, object prevState)
```

**Note:** The previous releases of ReactJS also uses `componentWillUpdate(object nextProps, object nextState)` for state changes. It has been deprecated in latest releases.

⬆ Back to Top

104. ### What is the recommended approach of removing an array element in React state?

The better approach is to use `Array.prototype.filter()` method.

For example, let's create a `removeItem()` method for updating the state.

```
javascript removeItem(index) { this.setState({ data: this.state.data.filter((item, i) => i !== index) }) }
```

⬆ Back to Top

105. ### Is it possible to use React without rendering HTML?

It is possible with latest version (>=16.2). Below are the possible options:

```
jsx harmony render() { return false }
```

```
jsx harmony render() { return null }
```

```
jsx harmony render() { return [] }
```
```

`jsx harmony render() { return <React.Fragment></React.Fragment> }`

`jsx harmony render() { return <></> }`

Returning `undefined` won't work.

⬆ Back to Top

106. ### How to pretty print JSON with React?

We can use `<pre>` tag so that the formatting of the `JSON.stringify()` is retained:

```jsx harmony const data = { name: 'John', age: 42 }

class User extends React.Component { render() { return (

      {JSON.stringify(data, null, 2)}

  )

} }

React.render(, document.getElementById('container')) ```

⬆ Back to Top

107. ### Why you can't update props in React?

The React philosophy is that props should be *immutable* and *top-down*. This means that a parent can send any prop values to a child, but the child can't modify received props.

⬆ Back to Top

108. ### How to focus an input element on page load?

You can do it by creating *ref* for `input` element and using it in `componentDidMount()`:

```jsx harmony class App extends React.Component{ componentDidMount() { this.nameInput.focus() }

render() { return (

this.nameInput = input} defaultValue={'Will focus'} />
) } } ReactDOM.render(, document.getElementById('app')) ``` Also in Functional component (react 16.08 and above) ```jsx harmony import React, {useEffect, useRef} from 'react'; const App = () => { const inputElRef = useRef(null) useEffect(()=>{ inputElRef.current.focus() }, []) return(

  )

}

ReactDOM.render(, document.getElementById('app')) ``` ⬆ Back to Top

109. ### What are the possible ways of updating objects in state?

    1. **Calling `setState()` with an object to merge with state:**
        - Using `Object.assign()` to create a copy of the object:

          `javascript const user = Object.assign({}, this.state.user, { age: 42 }) this.setState({ user })`
        - Using *spread operator*:

          `javascript const user = { ...this.state.user, age: 42 } this.setState({ user })`
    2. **Calling `setState()` with a function:**

       `javascript this.setState(prevState => ({ user: { ...prevState.user, age: 42 } }))`

⬆ Back to Top

110. ### How can we find the version of React at runtime in the browser?

You can use `React.version` to get the version.

```jsx harmony const REACT_VERSION = React.version

ReactDOM.render(

{`React version: ${REACT_VERSION}`}

, document.getElementById('app') ) ```

⬆ Back to Top

111. ### What are the approaches to include polyfills in your `create-react-app`?

There are approaches to include polyfills in create-react-app,
```

1. **Manual import from `core-js`:**

   Create a file called (something like) `polyfills.js` and import it into root `index.js` file. Run `npm install core-js` or `yarn add core-js` and import your specific required features.

   `javascript import 'core-js/fn/array/find' import 'core-js/fn/array/includes' import 'core-js/fn/number/is-nan'`

2. **Using Polyfill service:**

   Use the polyfill.io CDN to retrieve custom, browser-specific polyfills by adding this line to `index.html`:

   `html <script src='https://cdn.polyfill.io/v2/polyfill.min.js?features=default,Array.prototype.includes'></script>`

   In the above script we had to explicitly request the `Array.prototype.includes` feature as it is not included in the default feature set.

⬆ Back to Top

112. ### How to use https instead of http in create-react-app?

    You just need to use `HTTPS=true` configuration. You can edit your `package.json` scripts section:

    `json "scripts": { "start": "set HTTPS=true && react-scripts start" }`

    or just run `set HTTPS=true && npm start`

⬆ Back to Top

113. ### How to avoid using relative path imports in create-react-app?

    Create a file called `.env` in the project root and write the import path:

    `NODE_PATH=src/app`

    After that restart the development server. Now you should be able to import anything inside `src/app` without relative paths.

⬆ Back to Top

114. ### How to add Google Analytics for React Router?

    Add a listener on the `history` object to record each page view:

    `javascript history.listen(function (location) { window.ga('set', 'page', location.pathname + location.search) window.ga('send', 'pageview', location.pathname + location.search) })`

⬆ Back to Top

115. ### How to update a component every second?

    You need to use `setInterval()` to trigger the change, but you also need to clear the timer when the component unmounts to prevent errors and memory leaks.

    ```javascript componentDidMount() { this.interval = setInterval(() => this.setState({ time: Date.now() }), 1000) }

    componentWillUnmount() { clearInterval(this.interval) } ```

⬆ Back to Top

116. ### How do you apply vendor prefixes to inline styles in React?

    React *does not* apply *vendor prefixes* automatically. You need to add vendor prefixes manually.

    ```jsx harmony

    ```

⬆ Back to Top

117. ### How to import and export components using React and ES6?

    You should use default for exporting the components

    ```jsx harmony import React from 'react' import User from 'user'

    export default class MyProfile extends React.Component { render(){ return ( //... ) } } ```

    With the export specifier, the MyProfile is going to be the member and exported to this module and the same can be imported without mentioning the name in other components.

⬆ Back to Top

118. ### Why is a component constructor called only once?

    React's *reconciliation* algorithm assumes that without any information to the contrary, if a custom component appears in the same place on subsequent renders, it's the same component as before, so reuses the previous instance rather than creating a new one.

⬆ Back to Top

119. ### How to define constants in React?

    You can use ES7 `static` field to define constant.

    `javascript class MyComponent extends React.Component { static DEFAULT_PAGINATION = 10 }`

⬆ Back to Top

120. ### How to programmatically trigger click event in React?

    You could use the ref prop to acquire a reference to the underlying `HTMLInputElement` object through a callback, store the reference as a class property, then use that reference to later trigger a click from your event handlers using the `HTMLElement.click` method.

    This can be done in two steps:

    1. Create ref in render method:

       ```
       jsx harmony <input ref={input => this.inputElement = input} />
       ```

    2. Apply click event in your event handler:

       ```
       javascript this.inputElement.click()
       ```

⬆ Back to Top

121. ### Is it possible to use async/await in plain React?

    If you want to use `async` / `await` in React, you will need *Babel* and transform-async-to-generator plugin. React Native ships with Babel and a set of transforms.

⬆ Back to Top

122. ### What are the common folder structures for React?

    There are two common practices for React project file structure.

    1. **Grouping by features or routes:**

       One common way to structure projects is locate CSS, JS, and tests together, grouped by feature or route.

       ```
       common/ ├ Avatar.js ├ Avatar.css ├ APIUtils.js └ APIUtils.test.js feed/ ├ index.js ├ Feed.js ├ Feed.css ├ FeedStory.js ├ FeedStory.test.js └ FeedAPI.js profile/ ├ index.js ├ Profile.js ├ ProfileHeader.js ├ ProfileHeader.css └ ProfileAPI.js
       ```

    2. **Grouping by file type:**

       Another popular way to structure projects is to group similar files together.

       ```
       api/ ├ APIUtils.js ├ APIUtils.test.js ├ ProfileAPI.js └ UserAPI.js components/ ├ Avatar.js ├ Avatar.css ├ Feed.js ├ Feed.css ├ FeedStory.js ├ FeedStory.test.js ├ Profile.js ├ ProfileHeader.js └ ProfileHeader.css
       ```

⬆ Back to Top

123. ### What are the popular packages for animation?

    React Transition Group and *React Motion* are popular animation packages in React ecosystem.

⬆ Back to Top

124. ### What is the benefit of styles modules?

    It is recommended to avoid hard coding style values in components. Any values that are likely to be used across different UI components should be extracted into their own modules.

    For example, these styles could be extracted into a separate component:

    ```javascript export const colors = { white, black, blue }

    export const space = [ 0, 8, 16, 32, 64 ] ```

    And then imported individually in other components:

    ```
    javascript import { space, colors } from './styles'
    ```

⬆ Back to Top

125. ### What are the popular React-specific linters?

    ESLint is a popular JavaScript linter. There are plugins available that analyse specific code styles. One of the most common for React is an npm package called `eslint-plugin-react` . By default, it will check a number of best practices, with rules checking things from keys in iterators to a complete set of prop types.

    Another popular plugin is `eslint-plugin-jsx-a11y`, which will help fix common issues with accessibility. As JSX offers slightly different syntax to regular HTML, issues with `alt` text and `tabindex` , for example, will not be picked up by regular plugins.

⬆ Back to Top

126. ### How to make AJAX call and in which component lifecycle methods should I make an AJAX call?

    You can use AJAX libraries such as Axios, jQuery AJAX, and the browser built-in `fetch` . You should fetch data in the `componentDidMount()` lifecycle method. This is so you can use `setState()` to update your component when the data is retrieved.

    For example, the employees list fetched from API and set local state:

    ```jsx harmony class MyComponent extends React.Component { constructor(props) { super(props) this.state = { employees: [], error: null } }

    componentDidMount() { fetch('https://api.example.com/items') .then(res => res.json()) .then( (result) => { this.setState({ employees: result.employees }) }, (error) => { this.setState({ error }) } ) }

render() { const { error, employees } = this.state if (error) { return

Error: {error.message}

; } else { return (

{employees.map(employee => (
- {employee.name}-{employee.experience}
))}

```
    )
  }
```

} } ```

⬆ Back to Top

127. ### What are render props?

Render Props is a simple technique for sharing code between components using a prop whose value is a function. The below component uses render prop which returns a React element.

```jsx harmony (

# {`Hello ${data.target}`}

)}/> ```

Libraries such as React Router and DownShift are using this pattern.

## React Router

⬆ Back to Top

129. ### What is React Router?

React Router is a powerful routing library built on top of React that helps you add new screens and flows to your application incredibly quickly, all while keeping the URL in sync with what's being displayed on the page.

⬆ Back to Top

130. ### How React Router is different from history library?

React Router is a wrapper around the `history` library which handles interaction with the browser's `window.history` with its browser and hash histories. It also provides memory history which is useful for environments that don't have global history, such as mobile app development (React Native) and unit testing with Node.

⬆ Back to Top

131. ### What are the `&lt;Router&gt;` components of React Router v4?

React Router v4 provides below 3 `&lt;Router&gt;` components:

1. `&lt;BrowserRouter&gt;`
2. `&lt;HashRouter&gt;`
3. `&lt;MemoryRouter&gt;`

The above components will create *browser*, *hash*, and *memory* history instances. React Router v4 makes the properties and methods of the `history` instance associated with your router available through the context in the `router` object.

⬆ Back to Top

132. ### What is the purpose of `push()` and `replace()` methods of `history`?

A history instance has two methods for navigation purpose.

1. `push()`
2. `replace()`

If you think of the history as an array of visited locations, `push()` will add a new location to the array and `replace()` will replace the current location in the array with the new one.

⬆ Back to Top

133. ### How do you programmatically navigate using React Router v4?

There are three different ways to achieve programmatic routing/navigation within components.

1. **Using the `withRouter()` higher-order function:**

The `withRouter()` higher-order function will inject the history object as a prop of the component. This object provides `push()` and `replace()` methods to avoid the usage of context.

```jsx harmony import { withRouter } from 'react-router-dom' // this also works with 'react-router-native'

const Button = withRouter(({ history }) => ( { history.push('/new-location') }} > {'Click Me!'} )) ```

2. **Using `<Route>` component and render props pattern:**

   The `<Route>` component passes the same props as `withRouter()`, so you will be able to access the history methods through the history prop.

   ```jsx harmony import { Route } from 'react-router-dom'

   const Button = () => ( ( { history.push('/new-location') }} > {'Click Me!'} )} /> ) ```

3. **Using context:**

   This option is not recommended and treated as unstable API.

   ```jsx harmony const Button = (props, context) => ( { context.history.push('/new-location') }} > {'Click Me!'} )

   Button.contextTypes = { history: React.PropTypes.shape({ push: React.PropTypes.func.isRequired }) } ```

⬆ Back to Top

134. ### How to get query parameters in React Router v4?

   The ability to parse query strings was taken out of React Router v4 because there have been user requests over the years to support different implementation. So the decision has been given to users to choose the implementation they like. The recommended approach is to use query strings library.

   `javascript const queryString = require('query-string'); const parsed = queryString.parse(props.location.search);`

   You can also use `URLSearchParams` if you want something native:

   `javascript const params = new URLSearchParams(props.location.search) const foo = params.get('name')`

   You should use a *polyfill* for IE11.

⬆ Back to Top

135. ### Why you get "Router may have only one child element" warning?

   You have to wrap your Route's in a `<Switch>` block because `<Switch>` is unique in that it renders a route exclusively.

   At first you need to add `Switch` to your imports:

   `javascript import { Switch, Router, Route } from 'react-router'`

   Then define the routes within `<Switch>` block:

   `jsx harmony <Router> <Switch> <Route {/* ... */} /> <Route {/* ... */} /> </Switch> </Router>`

⬆ Back to Top

136. ### How to pass params to `history.push` method in React Router v4?

   While navigating you can pass props to the `history` object:

   `javascript this.props.history.push({ pathname: '/template', search: '?name=sudheer', state: { detail: response.data } })`

   The `search` property is used to pass query params in `push()` method.

⬆ Back to Top

137. ### How to implement *default* or *NotFound* page?

   A `<Switch>` renders the first child `<Route>` that matches. A `<Route>` with no path always matches. So you just need to simply drop path attribute as below

   `jsx harmony <Switch> <Route exact path="/" component={Home}/> <Route path="/user" component={User}/> <Route component={NotFound} /> </Switch>`

⬆ Back to Top

138. ### How to get history on React Router v4? Below are the list of steps to get history object on React Router v4,

   1. Create a module that exports a `history` object and import this module across the project.

      For example, create `history.js` file:

      ```javascript import { createBrowserHistory } from 'history'

      export default createBrowserHistory({ /* pass a configuration object here if needed */ }) ```

   2. You should use the `&lt;Router&gt;` component instead of built-in routers. Import the above `history.js` inside `index.js` file:

      ```jsx harmony import { Router } from 'react-router-dom' import history from './history' import App from './App'

      ReactDOM.render(( ), holder) ```

   3. You can also use push method of `history` object similar to built-in history object:

      ```javascript // some-other-file.js import history from './history'

      history.push('/go-here') ```
      ```

⬆ Back to Top

139. ### How to perform automatic redirect after login?

    The `react-router` package provides `<Redirect>` component in React Router. Rendering a `<Redirect>` will navigate to a new location. Like server-side redirects, the new location will override the current location in the history stack.

    ```javascript import React, { Component } from 'react' import { Redirect } from 'react-router'

    export default class LoginComponent extends Component { render() { if (this.state.isLoggedIn === true) { return } else { return

    {'Login Please'}
    } } } ```

## React Internationalization

⬆ Back to Top

140. ### What is React Intl?

    The *React Intl* library makes internalization in React straightforward, with off-the-shelf components and an API that can handle everything from formatting strings, dates, and numbers, to pluralization. React Intl is part of *FormatJS* which provides bindings to React via its components and API.

    ⬆ Back to Top

141. ### What are the main features of React Intl? Below are the main features of React Intl,

    ```
    1. Display numbers with separators.
    2. Display dates and times correctly.
    3. Display dates relative to "now".
    4. Pluralize labels in strings.
    5. Support for 150+ languages.
    6. Runs in the browser and Node.
    7. Built on standards.
    ```

    ⬆ Back to Top

142. ### What are the two ways of formatting in React Intl?

    The library provides two ways to format strings, numbers, and dates:

    1. **Using react components:**

       `jsx harmony <FormattedMessage id={'account'} defaultMessage={'The amount is less than minimum balance.'} />`

    2. **Using an API:**

       ```javascript const messages = defineMessages({ accountMessage: { id: 'account', defaultMessage: 'The amount is less than minimum balance.', } })

       formatMessage(messages.accountMessage) ```

    ⬆ Back to Top

143. ### How to use `<FormattedMessage>` as placeholder using React Intl?

    The `<Formatted... />` components from `react-intl` return elements, not plain text, so they can't be used for placeholders, alt text, etc. In that case, you should use lower level API `formatMessage()`. You can inject the `intl` object into your component using `injectIntl()` higher-order component and then format the message using `formatMessage()` available on that object.

    ```jsx harmony import React from 'react' import { injectIntl, intlShape } from 'react-intl'

    const MyComponent = ({ intl }) => { const placeholder = intl.formatMessage({id: 'messageId'}) return {placeholder} }

    MyComponent.propTypes = { intl: intlShape.isRequired }

    export default injectIntl(MyComponent) ```

    ⬆ Back to Top

144. ### How to access current locale with React Intl?

    You can get the current locale in any component of your application using `injectIntl()`:

    ```jsx harmony import { injectIntl, intlShape } from 'react-intl'

    const MyComponent = ({ intl }) => (

    {`The current locale is ${intl.locale}`}

    )

    MyComponent.propTypes = { intl: intlShape.isRequired }

    export default injectIntl(MyComponent) ```

    ⬆ Back to Top

145. ### How to format date using React Intl?

The `injectIntl()` higher-order component will give you access to the `formatDate()` method via the props in your component. The method is used internally by instances of `FormattedDate` and it returns the string representation of the formatted date.

```jsx harmony import { injectIntl, intlShape } from 'react-intl'

const stringDate = this.props.intl.formatDate(date, { year: 'numeric', month: 'numeric', day: 'numeric' })

const MyComponent = ({intl}) => (

{`The formatted date is ${stringDate}`}

)

MyComponent.propTypes = { intl: intlShape.isRequired }

export default injectIntl(MyComponent) ```

## React Testing

⬆ Back to Top

146. ### What is Shallow Renderer in React testing?

    *Shallow rendering* is useful for writing unit test cases in React. It lets you render a component *one level deep* and assert facts about what its render method returns, without worrying about the behavior of child components, which are not instantiated or rendered.

    For example, if you have the following component:

    `javascript function MyComponent() { return ( <div> <span className={'heading'}>{'Title'}</span> <span className= {'description'}>{'Description'}</span> </div> ) }`

    Then you can assert as follows:

    ```jsx harmony import ShallowRenderer from 'react-test-renderer/shallow'

    // in your test const renderer = new ShallowRenderer() renderer.render()

    const result = renderer.getRenderOutput()

    expect(result.type).toBe('div') expect(result.props.children).toEqual([ {'Title'}, {'Description'} ]) ```

    ⬆ Back to Top

147. ### What is `TestRenderer` package in React?

    This package provides a renderer that can be used to render components to pure JavaScript objects, without depending on the DOM or a native mobile environment. This package makes it easy to grab a snapshot of the platform view hierarchy (similar to a DOM tree) rendered by a ReactDOM or React Native without using a browser or `jsdom`.

    ```jsx harmony import TestRenderer from 'react-test-renderer'

    const Link = ({page, children}) => {children}

    const testRenderer = TestRenderer.create( {'Facebook'} )

    console.log(testRenderer.toJSON()) // { // type: 'a', // props: { href: 'https://www.facebook.com/' }, // children: [ 'Facebook' ] // } ```

    ⬆ Back to Top

148. ### What is the purpose of ReactTestUtils package?

    *ReactTestUtils* are provided in the `with-addons` package and allow you to perform actions against a simulated DOM for the purpose of unit testing.

    ⬆ Back to Top

149. ### What is Jest?

    *Jest* is a JavaScript unit testing framework created by Facebook based on Jasmine and provides automated mock creation and a `jsdom` environment. It's often used for testing components.

    ⬆ Back to Top

150. ### What are the advantages of Jest over Jasmine?

    There are couple of advantages compared to Jasmine:

    - Automatically finds tests to execute in your source code.
    - Automatically mocks dependencies when running your tests.
    - Allows you to test asynchronous code synchronously.
    - Runs your tests with a fake DOM implementation (via `jsdom`) so that your tests can be run on the command line.
    - Runs tests in parallel processes so that they finish sooner.

    ⬆ Back to Top

151. ### Give a simple example of Jest test case

    Let's write a test for a function that adds two numbers in `sum.js` file:

    ```javascript const sum = (a, b) => a + b

    export default sum ```

Create a file named `sum.test.js` which contains actual test:

```javascript import sum from './sum'

test('adds 1 + 2 to equal 3', () => { expect(sum(1, 2)).toBe(3) }) ```

And then add the following section to your `package.json`:

```
json { "scripts": { "test": "jest" } }
```

Finally, run `yarn test` or `npm test` and Jest will print a result:

```
console $ yarn test PASS ./sum.test.js ✓ adds 1 + 2 to equal 3 (2ms)
```

React Redux

⬆ Back to Top

152. ### What is flux?

    Flux is an *application design paradigm* used as a replacement for the more traditional MVC pattern. It is not a framework or a library but a new kind of architecture that complements React and the concept of Unidirectional Data Flow. Facebook uses this pattern internally when working with React.

    The workflow between dispatcher, stores and views components with distinct inputs and outputs as follows:

    ⬆ Back to Top

153. ### What is Redux?

    Redux is a predictable state container for JavaScript apps based on the *Flux design pattern*. Redux can be used together with React, or with any other view library. It is tiny (about 2kB) and has no dependencies.

    ⬆ Back to Top

154. ### What are the core principles of Redux?

    Redux follows three fundamental principles:

    1. **Single source of truth:** The state of your whole application is stored in an object tree within a single store. The single state tree makes it easier to keep track of changes over time and debug or inspect the application.
    2. **State is read-only:** The only way to change the state is to emit an action, an object describing what happened. This ensures that neither the views nor the network callbacks will ever write directly to the state.
    3. **Changes are made with pure functions:** To specify how the state tree is transformed by actions, you write reducers. Reducers are just pure functions that take the previous state and an action as parameters, and return the next state.

    ⬆ Back to Top

155. ### What are the downsides of Redux compared to Flux?

    Instead of saying downsides we can say that there are few compromises of using Redux over Flux. Those are as follows:

    1. **You will need to learn to avoid mutations:** Flux is un-opinionated about mutating data, but Redux doesn't like mutations and many packages complementary to Redux assume you never mutate the state. You can enforce this with dev-only packages like `redux-immutable-state-invariant`, Immutable.js, or instructing your team to write non-mutating code.
    2. **You're going to have to carefully pick your packages:** While Flux explicitly doesn't try to solve problems such as undo/redo, persistence, or forms, Redux has extension points such as middleware and store enhancers, and it has spawned a rich ecosystem.
    3. **There is no nice Flow integration yet:** Flux currently lets you do very impressive static type checks which Redux doesn't support yet.

    ⬆ Back to Top

156. ### What is the difference between `mapStateToProps()` and `mapDispatchToProps()`?

    `mapStateToProps()` is a utility which helps your component get updated state (which is updated by some other components):

    ```
    javascript const mapStateToProps = (state) => { return { todos: getVisibleTodos(state.todos, state.visibilityFilter) } }
    ```

    `mapDispatchToProps()` is a utility which will help your component to fire an action event (dispatching action which may cause change of application state):

    ```
    javascript const mapDispatchToProps = (dispatch) => { return { onTodoClick: (id) => { dispatch(toggleTodo(id)) } } }
    ```

    It is recommended to always use the “object shorthand” form for the `mapDispatchToProps`.

    Redux wraps it in another function that looks like (...args) => dispatch(onTodoClick(...args)), and pass that wrapper function as a prop to your component.

    ```
    javascript const mapDispatchToProps = ({ onTodoClick })
    ```

    ⬆ Back to Top

157. ### Can I dispatch an action in reducer?

    Dispatching an action within a reducer is an **anti-pattern**. Your reducer should be *without side effects*, simply digesting the action payload and returning a new state object. Adding listeners and dispatching actions within the reducer can lead to chained actions and other side effects.

    ⬆ Back to Top

158. ### How to access Redux store outside a component?

    You just need to export the store from the module where it created with `createStore()`. Also, it shouldn't pollute the global window object.
    ```

```javascript store = createStore(myReducer)

export default store ```

⬆ Back to Top

159. ### What are the drawbacks of MVW pattern?

    1. DOM manipulation is very expensive which causes applications to behave slow and inefficient.
    2. Due to circular dependencies, a complicated model was created around models and views.
    3. Lot of data changes happens for collaborative applications(like Google Docs).
    4. No way to do undo (travel back in time) easily without adding so much extra code.

⬆ Back to Top

160. ### Are there any similarities between Redux and RxJS?

    These libraries are very different for very different purposes, but there are some vague similarities.

    Redux is a tool for managing state throughout the application. It is usually used as an architecture for UIs. Think of it as an alternative to (half of) Angular. RxJS is a reactive programming library. It is usually used as a tool to accomplish asynchronous tasks in JavaScript. Think of it as an alternative to Promises. Redux uses the Reactive paradigm because the Store is reactive. The Store observes actions from a distance, and changes itself. RxJS also uses the Reactive paradigm, but instead of being an architecture, it gives you basic building blocks, Observables, to accomplish this pattern.

⬆ Back to Top

161. ### How to dispatch an action on load?

    You can dispatch an action in `componentDidMount()` method and in `render()` method you can verify the data.

    ```javascript class App extends Component { componentDidMount() { this.props.fetchData() }

    render() { return this.props.isLoaded ?

    {'Loaded'}
    :
    {'Not Loaded'}
    } }

    const mapStateToProps = (state) => ({ isLoaded: state.isLoaded })

    const mapDispatchToProps = { fetchData }

    export default connect(mapStateToProps, mapDispatchToProps)(App) ```

⬆ Back to Top

162. ### How to use `connect()` from React Redux?

    You need to follow two steps to use your store in your container:

    1. **Use `mapStateToProps()`:** It maps the state variables from your store to the props that you specify.
    2. **Connect the above props to your container:** The object returned by the `mapStateToProps` function is connected to the container. You can import `connect()` from `react-redux`.

       ```jsx harmony import React from 'react' import { connect } from 'react-redux'

       class App extends React.Component { render() { return

       {this.props.containerData}

       } }

       function mapStateToProps(state) { return { containerData: state.data } }

       export default connect(mapStateToProps)(App) ```

⬆ Back to Top

163. ### How to reset state in Redux?

    You need to write a *root reducer* in your application which delegate handling the action to the reducer generated by `combineReducers()`.

    For example, let us take `rootReducer()` to return the initial state after `USER_LOGOUT` action. As we know, reducers are supposed to return the initial state when they are called with `undefined` as the first argument, no matter the action.

    ```javascript const appReducer = combineReducers({ /* your app's top-level reducers */ })

    const rootReducer = (state, action) => { if (action.type === 'USER_LOGOUT') { state = undefined }

    return appReducer(state, action) } ```

    In case of using `redux-persist`, you may also need to clean your storage. `redux-persist` keeps a copy of your state in a storage engine. First, you need to import the appropriate storage engine and then, to parse the state before setting it to undefined and clean each storage state key.

    ```javascript const appReducer = combineReducers({ /* your app's top-level reducers */ })

    const rootReducer = (state, action) => { if (action.type === 'USER_LOGOUT') { Object.keys(state).forEach(key => { storage.removeItem( `persist:${key}` ) })

    ```
    state = undefined
    ```
    ```

}

return appReducer(state, action) } ```

⬆ Back to Top

164. ### Whats the purpose of `at` symbol in the Redux connect decorator?

The **@** symbol is in fact a JavaScript expression used to signify decorators. *Decorators* make it possible to annotate and modify classes and properties at design time.

Let's take an example setting up Redux without and with a decorator.

- **Without decorator:**

  ```javascript import React from 'react' import * as actionCreators from './actionCreators' import { bindActionCreators } from 'redux' import { connect } from 'react-redux'

  function mapStateToProps(state) { return { todos: state.todos } }

  function mapDispatchToProps(dispatch) { return { actions: bindActionCreators(actionCreators, dispatch) } }

  class MyApp extends React.Component { // ...define your main app here }

  export default connect(mapStateToProps, mapDispatchToProps)(MyApp) ```

- **With decorator:**

  ```javascript import React from 'react' import * as actionCreators from './actionCreators' import { bindActionCreators } from 'redux' import { connect } from 'react-redux'

  function mapStateToProps(state) { return { todos: state.todos } }

  function mapDispatchToProps(dispatch) { return { actions: bindActionCreators(actionCreators, dispatch) } }

  @connect(mapStateToProps, mapDispatchToProps) export default class MyApp extends React.Component { // ...define your main app here } ```

  The above examples are almost similar except the usage of decorator. The decorator syntax isn't built into any JavaScript runtimes yet, and is still experimental and subject to change. You can use babel for the decorators support.

⬆ Back to Top

165. ### What is the difference between React context and React Redux?

You can use **Context** in your application directly and is going to be great for passing down data to deeply nested components which what it was designed for.

Whereas **Redux** is much more powerful and provides a large number of features that the Context API doesn't provide. Also, React Redux uses context internally but it doesn't expose this fact in the public API.

⬆ Back to Top

166. ### Why are Redux state functions called reducers?

Reducers always return the accumulation of the state (based on all previous and current actions). Therefore, they act as a reducer of state. Each time a Redux reducer is called, the state and action are passed as parameters. This state is then reduced (or accumulated) based on the action, and then the next state is returned. You could *reduce* a collection of actions and an initial state (of the store) on which to perform these actions to get the resulting final state.

⬆ Back to Top

167. ### How to make AJAX request in Redux?

You can use `redux-thunk` middleware which allows you to define async actions.

Let's take an example of fetching specific account as an AJAX call using *fetch API*:

```javascript export function fetchAccount(id) { return dispatch => { dispatch(setLoadingAccountState()) // Show a loading spinner fetch( `/account/${id}`, (response) => { dispatch(doneFetchingAccount()) // Hide loading spinner if (response.status === 200) { dispatch(setAccount(response.json)) // Use a normal function to set the received state } else { dispatch(someError) } }) } }

function setAccount(data) { return { type: 'SET_Account', data: data } } ```

⬆ Back to Top

168. ### Should I keep all component's state in Redux store?

Keep your data in the Redux store, and the UI related state internally in the component.

⬆ Back to Top

169. ### What is the proper way to access Redux store?

The best way to access your store in a component is to use the `connect()` function, that creates a new component that wraps around your existing one. This pattern is called *Higher-Order Components*, and is generally the preferred way of extending a component's functionality in React. This allows you to map state and action creators to your component, and have them passed in automatically as your store updates.

Let's take an example of `<FilterLink>` component using connect:

```javascript import { connect } from 'react-redux' import { setVisibilityFilter } from '../actions' import Link from '../components/Link'

const mapStateToProps = (state, ownProps) => ({ active: ownProps.filter === state.visibilityFilter })

const mapDispatchToProps = (dispatch, ownProps) => ({ onClick: () => dispatch(setVisibilityFilter(ownProps.filter)) })

const FilterLink = connect( mapStateToProps, mapDispatchToProps )(Link)

export default FilterLink ```

Due to it having quite a few performance optimizations and generally being less likely to cause bugs, the Redux developers almost always recommend using `connect()` over accessing the store directly (using context API).

`javascript class MyComponent { someMethod() { doSomethingWith(this.context.store) } }`

⬆ Back to Top

170. ### What is the difference between component and container in React Redux?

**Component** is a class or function component that describes the presentational part of your application.

**Container** is an informal term for a component that is connected to a Redux store. Containers *subscribe* to Redux state updates and *dispatch* actions, and they usually don't render DOM elements; they delegate rendering to presentational child components.

⬆ Back to Top

171. ### What is the purpose of the constants in Redux?

Constants allows you to easily find all usages of that specific functionality across the project when you use an IDE. It also prevents you from introducing silly bugs caused by typos – in which case, you will get a `ReferenceError` immediately.

Normally we will save them in a single file ( `constants.js` or `actionTypes.js` ).

`javascript export const ADD_TODO = 'ADD_TODO' export const DELETE_TODO = 'DELETE_TODO' export const EDIT_TODO = 'EDIT_TODO' export const COMPLETE_TODO = 'COMPLETE_TODO' export const COMPLETE_ALL = 'COMPLETE_ALL' export const CLEAR_COMPLETED = 'CLEAR_COMPLETED'`

In Redux, you use them in two places:

1. **During action creation:**

   Let's take `actions.js` :

   ```javascript import { ADD_TODO } from './actionTypes';

   export function addTodo(text) { return { type: ADD_TODO, text } } ```

2. **In reducers:**

   Let's create `reducer.js` :

   ```javascript import { ADD_TODO } from './actionTypes'

   export default (state = [], action) => { switch (action.type) { case ADD_TODO: return [ ...state, { text: action.text, completed: false } ]; default: return state } } ```

⬆ Back to Top

172. ### What are the different ways to write `mapDispatchToProps()` ?

There are a few ways of binding *action creators* to `dispatch()` in `mapDispatchToProps()` .

Below are the possible options:

`javascript const mapDispatchToProps = (dispatch) => ({ action: () => dispatch(action()) })`

`javascript const mapDispatchToProps = (dispatch) => ({ action: bindActionCreators(action, dispatch) })`

`javascript const mapDispatchToProps = { action }`

The third option is just a shorthand for the first one.

⬆ Back to Top

173. ### What is the use of the `ownProps` parameter in `mapStateToProps()` and `mapDispatchToProps()` ?

If the `ownProps` parameter is specified, React Redux will pass the props that were passed to the component into your *connect* functions. So, if you use a connected component:

```jsx harmony import ConnectedComponent from './containers/ConnectedComponent';

```

The `ownProps` inside your `mapStateToProps()` and `mapDispatchToProps()` functions will be an object:

`javascript { user: 'john' }`

You can use this object to decide what to return from those functions.

⬆ Back to Top

174. ### How to structure Redux top level directories?

Most of the applications has several top-level directories as below:

1. **Components**: Used for *dumb* components unaware of Redux.
2. **Containers**: Used for *smart* components connected to Redux.
3. **Actions**: Used for all action creators, where file names correspond to part of the app.
4. **Reducers**: Used for all reducers, where files name correspond to state key.
5. **Store**: Used for store initialization.

This structure works well for small and medium size apps.

⬆ Back to Top

175. ### What is redux-saga?

`redux-saga` is a library that aims to make side effects (asynchronous things like data fetching and impure things like accessing the browser cache) in React/Redux applications easier and better.

It is available in NPM:

```
console $ npm install --save redux-saga
```

⬆ Back to Top

176. ### What is the mental model of redux-saga?

Saga is like a separate thread in your application, that's solely responsible for side effects. `redux-saga` is a redux *middleware*, which means this thread can be started, paused and cancelled from the main application with normal Redux actions, it has access to the full Redux application state and it can dispatch Redux actions as well.

⬆ Back to Top

177. ### What are the differences between `call()` and `put()` in redux-saga?

Both `call()` and `put()` are effect creator functions. `call()` function is used to create effect description, which instructs middleware to call the promise. `put()` function creates an effect, which instructs middleware to dispatch an action to the store.

Let's take example of how these effects work for fetching particular user data.

```javascript function* fetchUserSaga(action) { // `call` function accepts rest arguments, which will be passed to `api.fetchUser` function. // Instructing middleware to call promise, it resolved value will be assigned to `userData` variable const userData = yield call(api.fetchUser, action.userId)

// Instructing middleware to dispatch corresponding action. yield put({ type: 'FETCH_USER_SUCCESS', userData }) } ```

⬆ Back to Top

178. ### What is Redux Thunk?

Redux Thunk middleware allows you to write action creators that return a function instead of an action. The thunk can be used to delay the dispatch of an action, or to dispatch only if a certain condition is met. The inner function receives the store methods `dispatch()` and `getState()` as parameters.

⬆ Back to Top

179. ### What are the differences between `redux-saga` and `redux-thunk` ?

Both *Redux Thunk* and *Redux Saga* take care of dealing with side effects. In most of the scenarios, Thunk uses *Promises* to deal with them, whereas Saga uses *Generators*. Thunk is simple to use and Promises are familiar to many developers, Sagas/Generators are more powerful but you will need to learn them. But both middleware can coexist, so you can start with Thunks and introduce Sagas when/if you need them.

⬆ Back to Top

180. ### What is Redux DevTools?

Redux DevTools is a live-editing time travel environment for Redux with hot reloading, action replay, and customizable UI. If you don't want to bother with installing Redux DevTools and integrating it into your project, consider using Redux DevTools Extension for Chrome and Firefox.

⬆ Back to Top

181. ### What are the features of Redux DevTools? Some of the main features of Redux DevTools are below,

```
1. Lets you inspect every state and action payload.
2. Lets you go back in time by *cancelling* actions.
3. If you change the reducer code, each *staged* action will be re-evaluated.
4. If the reducers throw, you will see during which action this happened, and what the error was.
5. With `persistState()` store enhancer, you can persist debug sessions across page reloads.
```

⬆ Back to Top

182. ### What are Redux selectors and why to use them?

Selectors are functions that take Redux state as an argument and return some data to pass to the component.

For example, to get user details from the state:

```
javascript const getUserData = state => state.user.data
```

These selectors have two main benefits,

1. The selector can compute derived data, allowing Redux to store the minimal possible state
2. The selector is not recomputed unless one of its arguments changes

⬆ Back to Top

183. ### What is Redux Form?

Redux Form works with React and Redux to enable a form in React to use Redux to store all of its state. Redux Form can be used with raw HTML5 inputs, but it also works very well with common UI frameworks like Material UI, React Widgets and React Bootstrap.

⬆ Back to Top
```

184. ### What are the main features of Redux Form? Some of the main features of Redux Form are:

    1. Field values persistence via Redux store.
    2. Validation (sync/async) and submission.
    3. Formatting, parsing and normalization of field values.

    ⬆ Back to Top

185. ### How to add multiple middlewares to Redux?

    You can use `applyMiddleware()`.

    For example, you can add `redux-thunk` and `logger` passing them as arguments to `applyMiddleware()`:

    ```javascript import { createStore, applyMiddleware } from 'redux' const createStoreWithMiddleware = applyMiddleware(ReduxThunk, logger)(createStore)```

    ⬆ Back to Top

186. ### How to set initial state in Redux?

    You need to pass initial state as second argument to createStore:

    ```javascript const rootReducer = combineReducers({ todos: todos, visibilityFilter: visibilityFilter })

    const initialState = { todos: [{ id: 123, name: 'example', completed: false }] }

    const store = createStore( rootReducer, initialState ) ```

    ⬆ Back to Top

187. ### How Relay is different from Redux?

    Relay is similar to Redux in that they both use a single store. The main difference is that relay only manages state originated from the server, and all access to the state is used via *GraphQL* queries (for reading data) and mutations (for changing data). Relay caches the data for you and optimizes data fetching for you, by fetching only changed data and nothing more.

188. ### What is an action in Redux?

    *Actions* are plain JavaScript objects or payloads of information that send data from your application to your store. They are the only source of information for the store. Actions must have a type property that indicates the type of action being performed.

    For example, let's take an action which represents adding a new todo item:

    ```{ type: ADD_TODO, text: 'Add todo item' }```

    ⬆ Back to Top

## React Native

⬆ Back to Top

188. ### What is the difference between React Native and React?

    **React** is a JavaScript library, supporting both front end web and being run on the server, for building user interfaces and web applications.

    **React Native** is a mobile framework that compiles to native app components, allowing you to build native mobile applications (iOS, Android, and Windows) in JavaScript that allows you to use React to build your components, and implements React under the hood.

    ⬆ Back to Top

189. ### How to test React Native apps?

    React Native can be tested only in mobile simulators like iOS and Android. You can run the app in your mobile using expo app (https://expo.io) Where it syncs using QR code, your mobile and computer should be in same wireless network.

    ⬆ Back to Top

190. ### How to do logging in React Native?

    You can use `console.log`, `console.warn`, etc. As of React Native v0.29 you can simply run the following to see logs in the console:

    ```$ react-native log-ios $ react-native log-android```

    ⬆ Back to Top

191. ### How to debug your React Native?

    Follow the below steps to debug React Native app:

    1. Run your application in the iOS simulator.
    2. Press `Command + D` and a webpage should open up at `http://localhost:8081/debugger-ui`.
    3. Enable *Pause On Caught Exceptions* for a better debugging experience.
    4. Press `Command + Option + I` to open the Chrome Developer tools, or open it via `View` -> `Developer` -> `Developer Tools`.
    5. You should now be able to debug as you normally would.

React supported libraries & Integration

⬆ Back to Top

192. ### What is reselect and how it works?

Reselect is a **selector library** (for Redux) which uses *memoization* concept. It was originally written to compute derived data from Redux-like applications state, but it can't be tied to any architecture or library.

Reselect keeps a copy of the last inputs/outputs of the last call, and recomputes the result only if one of the inputs changes. If the the same inputs are provided twice in a row, Reselect returns the cached output. It's memoization and cache are fully customizable.

⬆ Back to Top

193. ### What is Flow?

Flow is a *static type checker* designed to find type errors in JavaScript. Flow types can express much more fine-grained distinctions than traditional type systems. For example, Flow helps you catch errors involving `null`, unlike most type systems.

⬆ Back to Top

194. ### What is the difference between Flow and PropTypes?

Flow is a *static analysis tool* (static checker) which uses a superset of the language, allowing you to add type annotations to all of your code and catch an entire class of bugs at compile time.

PropTypes is a *basic type checker* (runtime checker) which has been patched onto React. It can't check anything other than the types of the props being passed to a given component. If you want more flexible typechecking for your entire project Flow/TypeScript are appropriate choices.

⬆ Back to Top

195. ### How to use Font Awesome icons in React?

The below steps followed to include Font Awesome in React:

1. Install `font-awesome`:

   ```
   console $ npm install --save font-awesome
   ```

2. Import `font-awesome` in your `index.js` file:

   ```
   javascript import 'font-awesome/css/font-awesome.min.css'
   ```

3. Add Font Awesome classes in `className`:

   ```
   javascript render() { return <div><i className={'fa fa-spinner'} /></div> }
   ```

⬆ Back to Top

196. ### What is React Dev Tools?

React Developer Tools let you inspect the component hierarchy, including component props and state. It exists both as a browser extension (for Chrome and Firefox), and as a standalone app (works with other environments including Safari, IE, and React Native).

The official extensions available for different browsers or environments.

1. **Chrome extension**
2. **Firefox extension**
3. **Standalone app** (Safari, React Native, etc)

⬆ Back to Top

197. ### Why is DevTools not loading in Chrome for local files?

If you opened a local HTML file in your browser (`file://...`) then you must first open *Chrome Extensions* and check `Allow access to file URLs`.

⬆ Back to Top

198. ### How to use Polymer in React? You need to follow below steps to use Polymer in React,

1. Create a Polymer element:

   ```
   jsx harmony <link rel='import' href='../../bower_components/polymer/polymer.html' /> Polymer({ is: 'calender-element', ready: function() { this.textContent = 'I am a calender' } })
   ```

2. Create the Polymer component HTML tag by importing it in a HTML document, e.g. import it in the `index.html` of your React application:

   ```
   html <link rel='import' href='./src/polymer-components/calender-element.html'>
   ```

3. Use that element in the JSX file:

   ```javascript import React from 'react'

   class MyComponent extends React.Component { render() { return ( ) } }

   export default MyComponent ```

⬆ Back to Top

199. ### What are the advantages of React over Vue.js?

React has the following advantages over Vue.js:

1. Gives more flexibility in large apps developing.
2. Easier to test.
3. Suitable for mobile apps creating.
4. More information and solutions available.
   ```

Note: The above list of advantages are purely opinionated and it vary based on the professional experience. But they are helpful as base parameters.

⬆ Back to Top

200. ### What is the difference between React and Angular? Let's see the difference between React and Angular in a table format.

React	Angular
React is a library and has only the View layer	Angular is a framework and has complete MVC functionality
React handles rendering on the server side	AngularJS renders only on the client side but Angular 2 and above renders on the server side
React uses JSX that looks like HTML in JS which can be confusing	Angular follows the template approach for HTML, which makes code shorter and easy to understand
React Native, which is a React type to build mobile applications are faster and more stable	Ionic, Angular's mobile native app is relatively less stable and slower
In React, data flows only in one way and hence debugging is easy	In Angular, data flows both way i.e it has two-way data binding between children and parent and hence debugging is often difficult

Note: The above list of differences are purely opinionated and it vary based on the professional experience. But they are helpful as base parameters.

⬆ Back to Top

201. ### Why React tab is not showing up in DevTools?

When the page loads, *React DevTools* sets a global named `__REACT_DEVTOOLS_GLOBAL_HOOK__`, then React communicates with that hook during initialization. If the website is not using React or if React fails to communicate with DevTools then it won't show up the tab.

⬆ Back to Top

202. ### What are Styled Components?

`styled-components` is a JavaScript library for styling React applications. It removes the mapping between styles and components, and lets you write actual CSS augmented with JavaScript.

⬆ Back to Top

203. ### Give an example of Styled Components?

Lets create `<Title>` and `<Wrapper>` components with specific styles for each.

```javascript import React from 'react' import styled from 'styled-components'

// Create a
```