

# ReactJS Interview Questions

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## 1) What is React ??

- ReactJS is the Client Side Javascript Library.
- ReactJs given by facebook.
- ReactJS used to simplify the complex UI.
- By using ReactJS, we can split the complex UI to multiple executable solutions.
- Each executable solution called as component.
- Components are the building blocks of any React App.
- ReactJS is component based Library.
- We can reuse the components in ReactJS
- React's one-way data binding keeps everything modular and fast.
- ReactJS is not a MVC Framework. ReactJS is the View in MVC.

## 2) Explain Virtual DOM??

- virtual DOM is a lightweight JavaScript object.
- It is simply a copy of the real DOM
- Virtual Dom updates faster.
- Virtual Dom Can't directly update HTML
- DOM manipulation is very easy
- No memory wastage
- The render() function in React is responsible for creating a node tree from the React components.
- A ReactElement is a representation of a DOM element in the Virtual DOM.

## 3) What is JSX ??

- JSX stands for Javascript + XML
- Brower can't understand XML
- So, we must convert XML to Javascript
- We will use "Babel" tool for conversion.
- We will develop React Applications by using JSX.
- It makes easier to create templates
- It is faster than regular JavaScript because it performs optimization while translating the code to JavaScript
- JSX is a XML-like syntax extension to ECMAScript without any defined semantics

- variable declaration:

```
const element =Hello, jsonworld!;
```

Above tag syntax is neither a string nor HTML.

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It is called JSX, and it is a syntax extension to JavaScript. JSX produces React “elements”.

### 4) what is `React.createClass` ??

`React.createClass` allows us to generate component classes.

React allows us to implement component classes that use ES6 JavaScript classes.

The end result is the same -- we have a component class. But the style is different.

And one is using a custom JavaScript class system (`createClass`) while the other is using a "native" JavaScript class system.

When using React's `createClass()` method, we pass in an object as an argument. So we can write a component using `createClass` that looks like this:

```
import React,{Component} from "react";
```

```
const Contacts = React.createClass({
```

```
  render(){
```

```
    return (
```

```
      <div> .....</div>
```

```
    );
```

```
  }
```

```
});
```

```
export default Contacts;
```

Instead of using a method from the react library, we extend an ES6 class that the library defines, `Component`.

```
import React,{Component} from "react";
```

```
class Contacts extends React.Component({
```

```
  constructor(props){
```

```
    super(props);
```

```
  }
```

```
  render(){
```

```
    return(
```

```
      <div>-----</div>
```

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```
);  
}  
}
```

```
export default Contacts;
```

constructor() is a special function in a JavaScript class.

JavaScript invokes constructor() whenever an object is created via a class.

## 5) What is React DOM ??

- React DOM is the glue between React and the DOM.
- When you want to show your react component on DOM you need to use this ReactDOM.render(); from ReactDOM.

The react-dom package contains ReactDOM.render, ReactDOM.unmountComponentAtNode, and ReactDOM.findDOMNode, and in react-dom/server we have server-side rendering support with ReactDOMServer.renderToString and ReactDOMServer.renderToStaticMarkup.

- This package serves as the entry point to the DOM and server renderers for React.
- It is intended to be paired with the generic React package, which is shipped as react to npm.

### Installation

=====

```
npm install react react-dom
```

### In the browser

=====

```
var React = require('react');  
var ReactDOM = require('react-dom');
```

```
class MyComponent extends React.Component {  
  render() {  
    return <div>Hello World</div>;  
  }  
}
```

```
ReactDOM.render(<MyComponent />, node);
```

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On the server

=====

```
var React = require('react');
var ReactDOMServer = require('react-dom/server');

class MyComponent extends React.Component {
  render() {
    return <div>Hello World</div>;
  }
}

ReactDOMServer.renderToString(<MyComponent />);
```

API

---

react-dom findDOMNode render  
unmountComponentAtNode  
react-dom/server  
renderToString  
renderToStaticMarkup

6) what are the differences between Reactjs and Angular?

REACT

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- React is open source library for java script.
- React updates its virtual DOM.
- React uses one-directional data flow process.
- we can use react library with other programming libraries.
- React is good for developing web applications which contains simple mathematical operations.
- React supports JSX syntax.
- React use .jsx extension.

ANGULAR

=====

- Angular is a open source framework for java script.
- Angular directly updates its Real DOM.

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- Angular uses two-directional data flow.
- But Angular is a complete solution in itself as it is a complete framework we named.
- Angular is good for developing industrial applications which contains more mathematical operations.
- Angular supports TypeScript syntax.
- Angular uses .ts extension.

### 7) What are the Differences Between Angular, React, VueJS and NodeJS ??

reactjs

=====

1. React is an open source library for JavaScript.
2. React updates its virtual DOM.
3. React uses one-directional data flow process.

angularjs

=====

1. Angular is an open source framework for JavaScript.
2. Angular directly updates its Real DOM.
3. Angular uses two-directional data flow.

Vuejs

=====

1. Vue.js is the progressive framework for JavaScript which builds user interfaces and single page applications.
2. Vue.js is very easy to set-up and execute faster compared to other frameworks.

Nodejs

=====

1. Node.js is an open source runtime environment for developing server side and networking applications.
2. Node.js uses an event-based approach to address implicit scalability.

### 8) what are the differences between framework and library?

Framework

=====

1. A framework is a skeleton where application defines its own features to fill out the skeleton.
2. But in the framework the control is vice versa of library where framework calls or controls.

Library

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1. A library is a collection of class definitions for which code reusability is high.
2. When we call a method from a library at that time we are in control over the library.

## 9) Will react follows MVC?

No, React won't follow MVC because it follows unidirectional data flow where ever MVC follows two-directional data flow.

## 10) In how many ways we can create component?

In react.js we can create component in two ways ,that given below.

1>Class component.

```
Ex. import React, {Component} from "react";
class App extends React.Component{
  render(){
    return(
      <div>
        <b>HELLO WORLD</b>
      </div>
    )
  }
}
export default App;
```

2>Function component.

```
EX. Import React from "react";
const App=()=>=>{
  return <h1>Hello Rajesh!!!!</h1>
}
export default App;
```

## 11) what is state ??

- State is predefined object in react js. It is used to store the component related data.
- We can create state only inside the class component .If we want we can update the state value within the component itself.

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- There are two ways to initialize the state in React component.

- i) Directly inside the class
- ii) Inside the constructor

Ex:State Inside class

```
-----  
Class Test extends Component {  
    state={  
        Name:"Siva"  
    }  
    render () { return(  
<div>{ this.state.Name }</div>  
    )}  
}
```

Ex:State inside constructor

```
-----  
class App extends React.Component {  
  
    constructor() {  
  
        super();  
  
        this.state = { Name: "Sai" }  
  
    }  
    render () {  
        return (<div>  
            {  
                this.state.  
                Name }</div>  
        )  
    }  
}
```

### 12) what are props ??

- React props are like function arguments in JavaScript and attributes in HTML.
- React allows us to pass information to a component using something called props.

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- To pass the data from parent component to child component we can use props.
- Props are immutable(can't change the value of props).

Ex:

====

```
import React, { Component } from 'react'
export class App extends Component {
  render() {
    return (
      <div>
        <Greet wish="welcome"></Greet>
      </div>
    )
  }
}
```

```
import React, { Component } from 'react'
export class Greet extends Component {
  render() {
    return (
      <div>
        <h2>{this.props.wish}</h2> /*output is welcome*/
      </div>
    )
  }
}
```

Note: The value of wish can't be change in Greet Component. Because props are immutable.

### 13) what are the diffetences between state and props ??

state

-----

1. state is managed with in the component
2. state is mutable(can chage). The value of state properties can be change by using setState.
3. variables declared inside the function body
4. In class component state can be accessed using this keyword  
Ex: this.state { name: "rahul" } In functional component state can be accessed using "useState" hook import React, { useState } from 'react';

```
function Example() {
```



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```
const [count, setCount] = useState(0);
}
```

props  
----

- 1.props get passed through parent to child component
- 2.props are immutable(can't change)
- 3.props are function parameters
- 4.In class component props can be accessed using "this.props".
- 5.In Functional component props can be accessed by using "props".

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

### 14) how to change the state in ReactJS ??

By using setState() we can change the state.

Ex.

```
import React, { Component } from 'react'
export class StateChange extends Component {
  constructor(){
    super();
    this.state={
      age:20
    }
  }
  // without setState
  /* increment=()=>{
    this.state.age=this.state.age+1;// age value won't be incremented
    console.log(this.state.age);//incremented
  } */
  increment=()=>{
    this.setState({
      age:this.state.age+1 //whenever we click on button age value will change
    })
    console.log(this.state.age);
  }
  render() {
    return (
      <div>
        <h3 align='center'>Age:{ this.state.age}</h3>
      </div>
    )
  }
}
```

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```
    <button onClick={this.increment} >Increment</button>
  </div>
)
}
```

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---

```
}  
export default StateChange
```

### 15) explain map() function in reactjs

Map() function used to render array of data.

```
import React,{Component} from 'react';  
export default class State extends Component{  
  constructor(){  
    super();  
    this.state={  
      products:[  
        {'pid':111,'pname':'pone','pcost':10000},  
        {'pid':222,'pname':'ptwo','pcost':20000},  
        {'pid':333,'pname':'pthree','pcost':30000},  
        {'pid':444,'pname':'pfour','pcost':40000}],  
      sub:'ReactJs'  
    }  
  }  
  render(){  
    return(  
      <div align='center'>  
        <h1>{this.state.sub}</h1>  
        {this.state.products.map((element,index)=>(  
          <p>pid:{element.pid},pname:{element.pname}</p>))}  
      </div>  
    )  
  }  
}
```

### 16) How to apply the styles in reactJS?

Four ways to style react components.

#### i) . CSS Stylesheet

-----  
Simply import css file import './DottedBox.css' so you can have a separate css file for each component.

#### ii) Inline styling

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In React, inline styles are not specified as a string. Instead they are specified with an object whose key is the camel Cased version of the style name, and whose value is the style's value, usually a string.

We can create a variable that stores style properties and then pass it to the element like `style={nameOfvariable}`

We can also pass the styling directly `style={{color: 'pink'}}`

### iii) CSS Modules

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A CSS Module is a CSS file in which all class names and animation names are scoped locally by default.

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### iv) Styled-components

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Styled-components is a library for React and React Native that allows you to use component-level styles in your application that are written with a mixture of JavaScript and CSS

### 17) how to link the external templates to Components ??

Every component has a separate html file. However, in React, I see that render function itself includes the html template.

```
import React, { Component } from 'react';
```

```
class HelloWorld extends Component {  
  render() {  
    return (  
      <h2> Hello World </h2>  
    );  
  }  
}
```

```
export default HelloWorld;
```

Well I want to take

```
<h2> Hello World </h2>
```

outside the js file and put it in a separate html and import the html file to render function, for example

```
render() {  
  return (  
    import content of helloworld.html  
  );  
}
```

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### 18) how to provide communication between Components ??

At the moment I'm using three components: `<list />`, `<Filters />` and `<TopBar />`, now obviously when I change settings in `<Filters />` I want to trigger some method in `<list />` to update my view.

`<Filters />` is a child component of `<List />`

Both `<Filters />` and `<List />` are children of a parent component  
`<Filters />` and `<List />` live in separate root components entirely.

Scenario - 1

=====

You could pass a handler from `<List />` to `<Filters />`, which could then be called on the `onChange` event to filter the list with the current value.

Scenario 2

-----

Similar to scenario #1, but the parent component will be the one passing down the handler function to `<Filters />`, and it will pass the filtered list to `<List />`. I like this method better since it decouples the `<List />` from the `<Filters />`.

### 19) what is redux??

- Redux is an open-source JavaScript library for managing application state.
- It is most commonly used with libraries such as React or Angular for building user interfaces.
- Redux is a predictable state container for JavaScript applications. It helps you write applications that behave consistently, run in different environments (client, server, and native), and are easy to test.
- it helps you manage the data you display and how you respond to user actions.

### 20) what is flux ??

- Flux is a JavaScript architecture or pattern for UI which runs on a unidirectional data flow and has a centralized dispatcher.
- It was created by Facebook, and complements React as view. Flux is a pattern and Redux is a library.
- In Flux, an action is a simple JavaScript object, and that's the default case in Redux too, but when using Redux middleware, actions can also be functions and promises.
- Flux is a pattern for managing how data flows through a React application.
- It is a method of working with React components is through passing data from one parent component to its children components.

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### 21) what is store ??

- A store is basically just a plain JavaScript object that allows components to share state.
  - A store holds the whole state tree of your application.
  - The only way to change the state inside it is to dispatch an action on it.
- 

### 22) what is reducer ??

- The reducer is a pure function that takes the previous state and an action, and returns the next state.
- `newState =(initialState,action)`
- It "reduce" a collection of actions and an initial state (of the store) on which to perform these actions to get the resulting final state.

### 23) what is dispatch ??

- dispatch is a function of the Redux store.
- `dispatch()` is the method used to dispatch actions and trigger state changes to the store.
- You call `store.dispatch` to dispatch an action. This is the only way to trigger a state change. By default, a connected component receives `props.dispatch` and can dispatch actions itself.

### 24) what is subscribe ??

- It is a function of the Redux store.
- Every time the store changes.
- so it watches for changes and then tells react to redraw.
- `subscribe()` just lets you know every time the store changes.

### 25) explain state management in ReactJS ??

- React includes several ways of managing state in an application. State is an interface between your data and react.
- >React projects break data up into two categories:
  - State :read-write data that lives within a component
  - Props :read-only data sent to a component, may be updated later by the sending component (a parent)

The state can be changed by the component itself by calling `set state` which will trigger a re-render of the component. The state is managed in a container that also includes methods to work with a state object. A container looks and feels like any React component without the UI-part. Also, the `setState` function follows React's `setState` the only difference is, that `unstable setState` returns a Promise you can await.

### 26) how to maintain the immutability in ReactJS ??

- We can use `this.setState` to maintain the immutability

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- Immutable data management ultimately makes data handling safer.
- An immutable value or object cannot be changed, so every update creates new value, leaving the old one untouched.
- Debugging requires immutability in react.
- React component's API provides a `setState` method to make changes to the component internal state — but as the documentation makes clear, we have to be careful to always use the `setState` method and never manipulate `this.state` directly.

### 27) what is middleware in ReactJS ??

- Middleware is software that lies between an operating system and the applications running on it.
- In ReactJS the middleware sits in between the dispatch and reducers. We can alter our dispatched actions before they get to the reducers or execute some code during the dispatch.

### 28) what are the middlewares available in ReactJS ??

- The famous middlewares in ReactJS are `React-Thunk` and `React-Saga`. The middleware sits in between the dispatch and reducers.

### 29) what is thunk ??

- Thunk is a middleware library in react. It supports for asynchronous data flow. Asynchronous Messaging means that, it is a one way communication and the flow of communication is one way only.
- Thunk created by using “promises” functions. It allows to write action creators that return a function instead of an action.

### 30) what is saga ??

Thunk is a middleware library in react. It supports for asynchronous data flow. The reason that we need to use a middleware such as `Redux-Thunk` is because the Redux store only supports synchronous data flow. Sagas created by using “generator” functions.

### 31) what are the differences between Saga and Thunk ??

- Thunk and Saga are middle ware of redux.
- Without middleware redux store supports only synchronous data flow.
- Sagas and Thunk responsible for asynchronous, especially for AJAX calls.

Redux saga :

=====

- Sagas created by using “generator” functions.
- Sagas takes advantage of the “yield” keyword to halt execution within a function.
- Easy to test
- It is useful to express complex application logic.



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Redux thunk:

=====

- Thunk created by using “promises” functions.
  - Promises simple to use.
  - Thunk is a function that already has everything it needs to execute.
  - Difficult to test.
  - It is good for small use cases and for beginners.
  - Thunk logic is all contained inside the function.
-

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### 32) (how to provide the communication between reducers ??)

#### How to Combine reducers?

combineReducers useful for provide communication between reducers. Ex: if we are taken 2 reducers

=====

i)reducerA and    ii)reducerB

we can combine the two reducers in index.js like :

```
const rootReducer = combineReducers({ reducerA, reducerB });
```

### 33) what is combineReducers ??

- The combineReducers helper functions. It is useful for combine reducers in various places to create root reducer.
- This function helps you organize your reducers to manage their own slices of state.
- In redux, there is just one store, but combineReducers helps you keep the same logic between reducers.

Ex: If your app grows more complex, if you want to split your reducing function into separate functions

- The combineReducers helper functions turns an object whose values are different reducing functions into a single reducing function you can pass to createStore.

### 34) what is connect in Redux ??

- This function connects a react component to redux store.
- Connect() is used to interact with the store.
- We can dispatch and subscribe the data by connect() function.

### 35) How to make store available globally ??

By using provider in index.js we can make store available globally.

The <Provider/> makes the redux store globally

```
ReactDOM.render(<Provider store = {store}><App/></Provider>, document.getElementById('root'));
```

### 36) explain HOC in ReactJS ??

- "Higher Order Component" (HOC) is an Advanced technique in React for using    Component logic.
  - "Higher Order Component" is a function that takes a Component and returns a new Component.
  - "Higher Order Component" are common in third-party React libraries, such as Redux.
  - "HOC" is powerful tool based on which many libraries are getting developed.
  - "HOC" can help in simplifying and abstracting repeated logic in a React Applications.

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- "HOCs" are functional implementations of javascript.
- "HOCs" has an advanced react pattern allows us the capability of reusing component logic.
- "HOC" is a pure function, it has no side effects. It only returns a new Component.
- In "Higher Order Component" we don't modify or mutate the component. we create new ones.
- "HOC" is an abstraction or middle layer gives us the freedom to make any kind of changes in the core logic of container components without affecting the UI Layer.
- "HOCs" is the Redux framework which is generally used for the state management in complex ReactJS projects.

### (37) Explain life cycle hooks in Reactjs...?

#### (1) GETDEFAULTPROPS():

-----

- used as default props to the component, if the component is not passed with props and is used with this.props

Syntax:

-----

```
getDefaultProps:function(){  
  
  return{ Hello };  
  
};
```

#### (2) GETINITIALSTATE():

-----

- the getInitialState method enables to set the initialState value, that is accessible inside the component via this.state

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Syntax:

-----

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```
getInitialState:function(){  
  
return{ Hello } ;  
  
};
```

### (3) COMPONENTWILLMOUNT():

-----

- This hook has the ability to access the props(this.props) and state(this.state).But not the DOM.

```
componentWillMount:function(){  
  
};
```

### (4)RENDER():

-----

- When we call render everytime the state changes its value

i.e.,when the state value is modified by

```
this.setState({  
  
  counter:  
  
})  
  
syntax:  
  
render:function(){  
  
  return JSX DOM  
  
}
```

- Neither props nor state should be modified inside this function.

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- render function has to be pure, meaning that the same results is returned every time the method is invoked.

(5) COMPONENTDIDMOUNT():

-----

- Called once, after the render method is called.
- This hook has the ability to access the props(this.props) and state(this.state) and the DOM too.

Syntax:

-----

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```
componentDidMount:function(){  
  
};
```

### (6) COMPONENTWILLRECEIVEPROPS():

-----

- It will not be called on the initial render, but called in each subsequent renders.

Syntax:

-----

```
componentWillReceiveProps:function(newProps){  
  
};
```

### (7) SHOULDCOMPONENTUPDATE():

-----

- This is always called before the render method and enables to define if a re-rendering is needed or can be skipped based on the boolean value it returns.

Syntax:

-----

```
shouldComponentUpdate:function(nextProps,nextState){  
  
    return true;  
  
};
```

### (8) COMPONENTWILLUPDATE():

-----

- ComponentWillUpdate gets called as soon as the shouldComponentUpdate returned true.

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- Any state changes via this.setState are not allowed.
- Strictly used to prepare for an upcoming update, not trigger an update itself.

Syntax:

-----

```
componentWillUpdate:function(nextProps,nextState){  
  
};
```



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### (9) COMPONENTDIDUPDATE():

-----

- componentDIDUpdate gets called as soon as the ShouldComponentUpdate returned true.
- Any State changes via this.setState are not allowed.
- Strictly used to prepare for an upcoming update not trigger an update itself.

Syntax:

-----

```
componentDidUpdate:function(prevProps,prevState){  
  
};
```

### (10) COMPONENTWILLUNMOUNT():

-----

- called once. after the render method is called and before the component is removed from the DOM.
- used when needing to perform cleanup operations,i.e.,removing any timers defined in componentDidMount.

syntax:

-----

```
componentWillUnmount:function(){  
  
};
```

### (38) Is render mandatory in ReactJs... ?

- Yes, render() function is mandatory in ReactJs.
- The render() method is the only required method in a class Component.
- The render() function should be pure.

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- Render() function does not modify component state.
- Render() function returns the same result each time it's invoked.
- render() function does not directly interact with the browser.

### (39) What are pure Components in Reactjs...?

- Pure Components compare all the properties of the current state with the next state, and current props with the next props.
- Pure Components help in reducing unnecessary render() method calls.
- A very specific thing about pure Components is the shallow comparison.
- Shallow comparison means that you compare the immediate contents of the objects instead of recursively comparing all the key/value pairs of the object.
- In pure Components JavaScript is completely based on Objects.
- Pure Components are ideal for classes with minimal and immutable properties.
- A component is said to be pure if it is guaranteed to return the same result given the same props and state.
- Class Component can be pure too as long as their props and state are immutable.
- Functional Component is a good example of a pure Component.
- React.PureComponent is used for optimizing performances.

### (40) what are the differences between stateful and stateless components in Reactjs. ...?

Stateful Components:

-----

- Stateful Components are always class components.
- Stateful components have a state that gets initialised in the constructor.

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- Stateful Component can render both props and state
- In stateful Components the props and state are rendered like `{this.props.name}` and `{this.props.state}` respectively.
- In stateful Component render depends upon the value of the state.
- In Stateful class Component can be stateful or Stateless component
- Stateful presentational Component responsible for rendering form, gathering user input.
- stateful container component responsible for storing application data.

### ----- Stateless Components:

we can use either function or class for creating stateless Components.

- stateless Components are those components which don't have any state at all.
- A Stateless Components can render props.
- In Stateless Components the props are displayed like `{props.name}`
- Stateless function looks like a normal function with no render method.
- A stateless Component renders output which depends upon props value.
- In Stateless Component functional Component is always a stateless component.
- stateless presentational component responsible for iterating through the data to be rendered.

### 41) what is functional component in ReactJS ??

it is simple javascript function and pass data by using props

it is use for ajax and API request.

Collection of navigational component

- > And Enable navigation among view
- > Router Component( `<BrowserRouter>`)
- > Routing matching component( `<Route/>` and `<Switch/>`)
- > Navigational Component(`<Link>`) Collection of navigational component

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- > And Enable navigation among view
- >Router Component( <BrowserRouter>)
- >Routing matching component( <Route/> and <Switch/>)
- >Navigational Component(<Link>)

### 42) explain "axios" module in ReactJS ??

- Axios is a promise-based HTTP client that works both in the browser and in a node.js environment.
- Axios is a lightweight HTTP client based similar to a Fetch API.
- Axios is promise-based async/await library for the readable asynchronous code.
- We can easily integrate with React.js, and it is effortless to use in any frontend framework.

### 43) explain Routing in ReactJS ??

React router is a routing library built on top of the react which is used to create the routing in reactapps.

we are using the create-react-app to create the app.

-----  
npx create-react-app routing  
cd routing

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To install the react router you need to download the react-router-dom package by running the following commands.

-----  
npm install react-router-dom  
npm start //to run dev server

If you navigate to the public/index.html you will see a single html file which looks like this.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <meta name="theme-color" content="#000000">
    <link rel="manifest" href="%PUBLIC_URL%/manifest.json">
    <link rel="shortcut icon" href="%PUBLIC_URL%/favicon.ico">
    <title>React App</title>
  </head>
  <body>
    <div id="root"></div>
  </body>
</html>
```

Currently, in our app, there is only a single App component.

-----  
users.js

=====

```
import React from 'react'
class Users extends React.Component {
  render() {
    return <h1>Users</h1>
  }
}
export default Users
```

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---

contact.js

=====

```
import React from 'react'
class Contact extends React.Component {
  render() {
    return <h1>Contact</h1>
  }
}
export default Contact
```

app.js

=====

```
import React from 'react'
class App extends React.Component {
  render() {
    return (
      <div>
        <h1>Home</h1>
      </div>
    )
  }
}
export default App
```

Now our app has three components one is App and the other two are Users and Contact.

Routing

=====

open the index.js file and import the three components (App,Users,Contact)

index.js

=====

```
import React from 'react'
import ReactDOM from 'react-dom'
import './index.css'
import App from './App'
import Users from './users'
```

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```
import Contact from './contact'  
ReactDOM.render(<App />, document.getElementById('root'))
```

React router gives us three components [Route, Link, BrowserRouter] which help us to implement the routing.

```
index.js  
=====
```

```
import React from 'react'  
import ReactDOM from 'react-dom'  
import { Route, Link, BrowserRouter as Router } from 'react-router-dom'  
import './index.css'  
import App from './App'  
import Users from './users'  
import Contact from './contact'  
ReactDOM.render(<App />, document.getElementById('root'))
```

In the Route component, we need to pass the two props

path: it means we need to specify the path.

component: which component user needs to see when they will navigate to that path.

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```
import React from 'react'
import ReactDOM from 'react-dom'
import './index.css'
import { Route, Link, BrowserRouter as Router } from 'react-router-dom'
import App from './App'
import Users from './users'
import Contact from './contact'
const routing = (
  <Router>
    <div>
      <Route path="/" component={ App } />
      <Route path="/users" component={ Users } />
      <Route path="/contact" component={ Contact } />
    </div>
  </Router>
)
ReactDOM.render(routing, document.getElementById('root'))
```

Now if you enter manually localhost:3000/users you will see Users component is rendered.

But still, Home component is also rendered in the screen this happens because of our home path is '/' and users path is '/users' slash is same in both paths so that it renders both components to stop this behavior we need to use the exact prop.

```
import React from 'react'
import ReactDOM from 'react-dom'
import './index.css'
import { Route, Link, BrowserRouter as Router } from 'react-router-dom'
import App from './App'
import Users from './users'
import Contact from './contact'
const routing = (
  <Router>
    <div>
      <Route exact path="/" component={ App } />
      <Route path="/users" component={ Users } />
      <Route path="/contact" component={ Contact } />
    </div>
  </Router>
)
```



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ReactDOM.render(routing, document.getElementById('root'))

Adding Navigation using Link component

index.js

```
import React from 'react'
import ReactDOM from 'react-dom'
import './index.css'
import { Route, Link, BrowserRouter as Router } from 'react-router-dom'
import App from './App'
import Users from './users'
import Contact from './contact'
const routing = (
  <Router>
    <div>
      <ul>
        <li>
          <Link to="/">Home</Link>
        </li>
        <li>
          <Link to="/users">Users</Link>
        </li>
        <li>
          <Link to="/contact">Contact</Link>
        </li>
      </ul>
      <Route exact path="/" component={ App } />
      <Route path="/users" component={ Users } />
      <Route path="/contact" component={ Contact } />
    </div>
  </Router>
)
ReactDOM.render(routing, document.getElementById('root'))
```

After adding navigation you will see the routes are rendered on the screen. if you click on the users you will see url is changing and Users component is rendered.

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### 44) how to read the Routing Parameters in Single Page Applications ??

Route.match.param.variableName  
(`https://api.github.com/users/\${props.match.params.id}`)

### 45) Explain MERN Development ??

MERN Means Combination of four Technology client side ,server side database and UI

- >MongoDB(database)
- >Express(For Api development)
- >ReactJs (For UI)
- >Nodejs(For Server side)

### 46) How to Handle the Form Validations in ReactJS ??

We'll use create-react-app to get up and running quickly with a simple React app.  
Install the package from npm and create a new app:

```
$ npm install -g create-react-app  
$ create-react-app react-form-validation-demo
```

Now let's run the app:

```
$ cd react-form-validation-demo/  
$ npm start  
That opens http://localhost:3000/ where our new app is running.
```

Next, let's add bootstrap so that we can style our form easily:

```
$ npm install react-bootstrap — save  
$ npm install bootstrap@3 — save
```

Import Bootstrap CSS and optionally Bootstrap theme CSS in the beginning of the src/index.js file:

```
import 'bootstrap/dist/css/bootstrap.css';  
import 'bootstrap/dist/css/bootstrap-theme.css';
```

Ok, now let's build the core of our demo app. Let's add a Form component.

In src/App.js, let's replace the default intro text markup with a Form component that we're going to build. We also n

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eed to import it:

```
import React, { Component } from 'react';
import logo from './logo.svg';
import './App.css';
import Form from './Form.js';class App extends Component {
  render() {
    return (
      <div className="App">
        <div className="App-header">
          <img src={logo} className="App-logo" alt="logo" />
          <h2>React Form Validation Demo</h2>
        </div>
        <Form />
      </div>
    );
  }
}
```

export default App;

Now, let's create that Form component in src/Form.js.

### 47) Explain Yarn tool importance in Reactjs ?

yarn tool is the Native tool given by facebook .

yarn tool used to download the libraries in faster manner in React.

yarn is very fast when installing dependencies in project and NPM installs packages sequentially.

slows down the performance significantly yarn solves this problems installing these packages in parallel .

### 48)How to Create React Application?

Ans.Create React Application Mainly 8 Steps are there.

STEP 1: Download And Install Node Js .

STEP 2: Download And Install Git .

STEP 3:Install yarn tool by following Command

> npm install -g yarn@latest

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STEP 4: Install "create-react-app" tool by following command  
> npm install -g create-react-app@latest

STEP 5: Create the React Application by following Command  
> create-react-app filename

STEP 6: Switch to React Application by following Command  
> cd filename

STEP 7: Execute the React Application Following Command  
> npm start (or) yarn start

49) **What is NPX ?**

50) NPX means Node Package eXecute.

NPX is a NPM package runner . its helps to execute packages without installing explicitly. NPX makes it easy to install and manage dependencies hosted in NPM registry and its simplifies the process and provides a better for executables .

51) **what is create-react-app ?**

"create-react-app" is the tool given by facebook developers. and this tool used to create the React Applications and it saves you from time consuming setup configuration.

-->We will install " create-react-app " by using following command

> npm install -g create-react-app@latest

Q 51) **what is babel ??**

1. "Babel" is a free and open-source JavaScript transpiler.

2. "Babel" is popular tool for using the newest features of the JavaScript.

3. "Babel" can convert JSX syntax.

4. We can install "babel" using following command:

> npm install --save-dev 'babel-cli'.

5. Babel enables us to write modern JavaScript that will be "transpiled" to supported ES5 JavaScript. We call this process transpiling.

6. There are a few ways to use Babel in projects.

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7. The simple and fast way is to use the package "babel-standalone".

8. We can include it in a script tag using "cdn" like this:

```
<script  
  src="https://cdnjs.cloudflare.com/ajax/libs/babel-standalone/6.18.1/babel.min.js">  
</script>
```

9. Babel will automatically transpile any script tags with type "text/babel" or "text/jsx".

10. Example:

```
<div id="output"></div>  
  
<script type="text/babel">  
  const getMessage = () => "Hello World";  
  document.getElementById('output').innerHTML = getMessage();  
</script>
```

**Q 52: Is it possible to develop React Applications by using TypeScript ??**

1. Yes it is possible to develop React Applications by using TypeScript.
2. Typescript is used for making React apps more stable, readable and manageable.
3. To create a new app with Typescript use the following command:

```
> yarn create react-app app_name --typescript
```

or

```
> npx create-react-app app_name --typescript
```

4. But TypeScript, requires much more time to compile as compare with JavaScript.

**Q 53) what is super() ??**

1. "super" keyword is used as a "function" which calls the parent class.
2. The super() in javascript is used to call the methods of the parent class.
3. It is used within a constructor function to call the parent constructor function.

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### Q 54) Advantages and disadvantages of reactjs ??

\*\*\*\*\* Advantages \*\*\*\*\*

1. Virtual DOM in ReactJS makes user experience better and developer's work faster.
2. React components can be re-used easily throughout the application.
3. JSX makes components/blocks code read-able.
4. ReactJS improves performance due to virtual DOM.
5. ReactJS applications are easy to test.
6. Benefit of Having JavaScript Library because JavaScript library provides more flexibility.
7. JSX is an optional syntax extension to JavaScript that makes writing our own components much easier.
8. It is SEO(Search Engine Optimization) friendly.

\*\*\*\*\* Disadvantages \*\*\*\*\*

1. React technologies updating so fast that there is no time to make proper documentation.
2. ReactJS Covers only the UI Layers of the app and nothing else.
3. JSX(JavaScript eXtension) as a barrier: React uses JSX, HTML with JavaScript mixed together. For new Developers JSX is a barrier.
4. ReactJS is not for small scale projects.
5. The frequent updates of react js is a major cause of frustration among developer.

### Q 55) what are uses of reactJS ??

ReactJS is an open-source JavaScript library which is used for building UI(User Interface) specifically for single page applications.

1. Simplicity: -ReactJS is just simple to learn.

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- React having component-based approach,
  - Well-defined lifecycle, and
  - React uses plain JavaScript that makes React very simple to learn and build a professional web pages.
2. React can be used to create mobile applications with the help of "React Native".
  3. Testability: ReactJS applications are easy to test.
  4. Increases productivity and helps in maintenance.
  5. ReactJS uses Downward Data Flow. If we made any small changes in child structure it won't affect the parents. Technically we call it "Code stability".
  6. Another important uses of React JS is a user-friendly development platform.

### Q 56) what is DOM ??

1. DOM stands for "Document Object Model".
2. DOM represents the documents(HTML or XML) and it can be modified with a scripting language such as "javascript".
3. DOM is a programming interface for "HTML" and "XML" documents.
4. In simple words we can say that DOM is a programming API for documents.
5. DOM defines a standard for accessing documents.
6. It represent the web pages in a structured hierarchical.
7. With the help of DOM a programmer can create and build documents, navigate their structure and add, modify or delete elements and content.

### Q 57) what are the differences between DOM & Virtual DOM ??

#### DOM

-----  
1. It updates slow.

2. DOM can directly update HTML.

#### Virtual DOM

-----  
1. It updates faster.

2. Can't directly update HTML.

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- |  |  |
|--|--|
| 3. Creates a new DOM if element updates. | 3. Updates the JSX if element updates. |
| 4. DOM manipulation is very expensive.   | 4. DOM manipulation is very easy.      |
| 5. Too much of memory wastage.           | 5. No memory wastage.                  |

### Q 58) what is shadow DOM ??

1. Way of encapsulating the implementation of web components is known as "Shadow DOM".
2. We can hide the implementation details of web component by using "Shadow DOM".
3. Example:  
HTML5 slider input, while the regular DOM recognizes this as a simple `<input/>` tag, there is underlying HTML and CSS that make slide feature.
4. The sub-tree of DOM nodes is hidden from the main DOM to encapsulate the implementation of HTML5 slider.
5. Shadow DOM provides isolated scope for web components.
6. "Isolate scope" make the components reusable and permit to control the binding.

### Q 59) explain events in ReactJS ??

1. React events are named using camelCase, rather than lowercase.
2. Example:  
`<button onClick={activateLasers}>`  
    Activate Lasers  
`</button>`
3. Component method is called when an event occurs.

### Q 60) explain ref ??

1. The "ref" is used to return a reference to the element.
2. "ref" is used when we want to add methods to the components.
3. "ref" act as an id.



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4. Example:

```
<input value = {this.state.data}

    onChange = {this.updateState}

    ref = "myInput">

</input>
```

5. If "ref" points to a "standard component" (DOM node, such as input, select, div etc) then to retrieve the element; we just need to call "this.refs.ref".

6. If "ref" points to a "composite component" (a custom component we have created ourself) we need to use the new ReactDOM module like "ReactDOM.findDOMNode(this.refs.ref)".

**Q 61) how to pass the data between components with out props ??**

No we can not send data between two components without using props.

**Q 62) selector in redux ??**

1. "Selector" is simply a function that accept Redux "state" as an argument and return that data which is derived from "state".

2. "Selector" are very efficient.

3. Selector is a middleman between components and state. This middleman will be a function that access state directly.

4. Example:

Suppose we save a property called firstName and lastName in our state. We want to display the full name in our component.

So instead of pulling "firstName" and "lastName" to our component with the help of connect, we can just create a "selector".

This "selector" will just join firstName and lastName and return the full name.

**Q 63) explain closures ??**

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1. Any inner function that access the outer function members as well as "Lexical scope" members called as "closures".

2. In JavaScript, closures are created every time a function is created, at function creation time.

3. closures are the primary mechanism used to enable data privacy.

4. In functional programming, closures are frequently used for "partial application" & "currying".

5. Example:

```
<script>
```

```
let fun_one = function(){
```

```
let i = 10;
```

```
let j = 20;
```

```
return function(){
```

```
console.log(i);
```

```
console.log(j);
```

```
}
```

```
};
```

```
console.dir(fun_one()); //closure(fun_one){i:10, j:20}
```

```
</script>
```

6. The closure has access to the variable in three scopes:

- Variable declared in his own scope
- Variable declared in parent function scope
- Variable declared in the global namespace.

-

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### Q 64) In how many ways can we create functions ??

In JavaScript a function can be declared using several ways:

1. Function declaration: A function declaration is made of function keyword, followed by function name.

Example: function isEven(num) {

```
    return num % 2 === 0;
```

```
}
```

2. Function expression: A function expression is determined by a function keyword, followed by an optional function name.

```
const myFunctionVar = function(variable) {
```

```
    return typeof variable;
}
```

3. Shorthand method definition: Shorthand method definition can be used in a method declaration.

Example: const collection = {

```
    items: [],
```

```
    add(...items) {
```

```
        this.items.push(...items);
    },
```

```
    get(index) {
```

```
        return this.items[index];
    }
};
```

```
collection.add('C', 'Java', 'PHP');
```

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```
collection.get(1); //'Java'
```

4. Arrow function: An arrow function is defined using parenthesis that contains the list of parameters followed by arrow symbol( $\Rightarrow$ ).

- When arrow function has only "one parameter" parenthesis can be omitted.
- When it contains a single statement, the curly{ } braces can be omitted too.

Example: `const absValue = (number) => {`

```
  if (number < 0) {
```

```
    return -number;
  }
```

```
  return number;
};
```

```
absValue(-10); //10
```

```
absValue(5); //5
```

5. Generator function: The generator function in JavaScript returns a Generator object.

- The generator function can be declared in the following forms:

a.function\* <name>():

Example: `function* indexGenerator(){`

```
  var index = 0;
```

```
  while(true) {
```

```
    yield index++;
```

```
  }
}
```

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```
const g = indexGenerator();
```

```
console.log(g.next().value); //0
```

```
console.log(g.next().value); //1
```

b. function\* ():

Example: const indexGenerator = function\* () {

```
    let index = 0;
```

```
    while(true) {
```

```
        yield index++;
```

```
    }
```

```
};
```

```
    const g = indexGenerator();
```

```
    console.log(g.next().value); //0
```

```
    console.log(g.next().value); //1
```

c. \*<name>():

Example: const obj = {

```
    *indexGenerator() {
```

```
        var index = 0;
```

```
        while(true) {
```

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---

```
        yield index++;  
      }  
    }  
  }
```

```
const g = obj.indexGenerator();
```

```
console.log(g.next().value); //0
```

```
console.log(g.next().value); //1
```

### Q 65) what are the advantages of arrow functions ??

1. Arrow functions were introduced in ES6. Arrow functions allow us to write shorter function syntax.
2. If function has only one statement and the statement returns a value, we can remove the brackets and the return keyword.
3. If we have only one parameter, we can skip the parentheses as well.
4. No binding of this keyword.
5. Arrow function are more secured as compared to normal function.
6. Arrow function utilizes the heap memory.
7. We can use arrow function as a "call back" function.

### Q 66) what is memo ??

1. "memo" is like pure components.
2. It will help us to control when our components re-render.
3. React.memo() works with functional components.
4. React.memo() is used to wrap a functional component.
5. To import "memo" use following code:

```
import { memo } from "react";
```

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6. React.memo() improves the performance.

7. Example:

```
export function Movie({ title, releaseDate }) {
```

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---

```
return(  
  <div>  
    <div> Movie Title:{title} </div>  
    <div> Release Date:{releaseDate} </div>  
  </div>);  
}  
export const MemoizedMovie = React.memo(Movie);
```

### Que 67) Explain Hooks in ReactJS ??

1. React "Hooks" are a way to add React.Component features to functional components. Features like:

=> State

=> Lifecycle

2. Hooks use React's features without classes.

3. React provides a few build-in Hooks like useState, useEffect etc.

4. Hooks are a new addition in React 16.8.

### Q 68) What is Synthetic event in ReactJS ??

1. "Synthetic Events" is a cross-browser wrapper around the browser's native event.

2. React implements a "synthetic event" system that brings consistency and high performance to react applications and interfaces.