React Js

By Codek Academy

What is React?

React is a JavaScript library for building user interfaces. It is maintained by Facebook and a community of individual developers and companies. React can be used as a base in the development of single-page or mobile applications.

Why Learn React?

- Popularity and Community: React is one of the most popular JavaScript libraries, with a large community and extensive documentation.
- Reusable Components: React's component-based architecture allows for reusable components, making your code more maintainable and scalable.
- Performance: React is known for its high performance due to the virtual DOM.
- Versatility: You can use React for web applications, mobile applications (with React Native), and even for building desktop applications.

Getting Started

- To get started with React, you need to have Node.js and npm (Node Package Manager) installed on your computer. You can download them from nodejs.org.

- You can create a new React application using the Create React App CLI tool. Run the following command in your terminal:

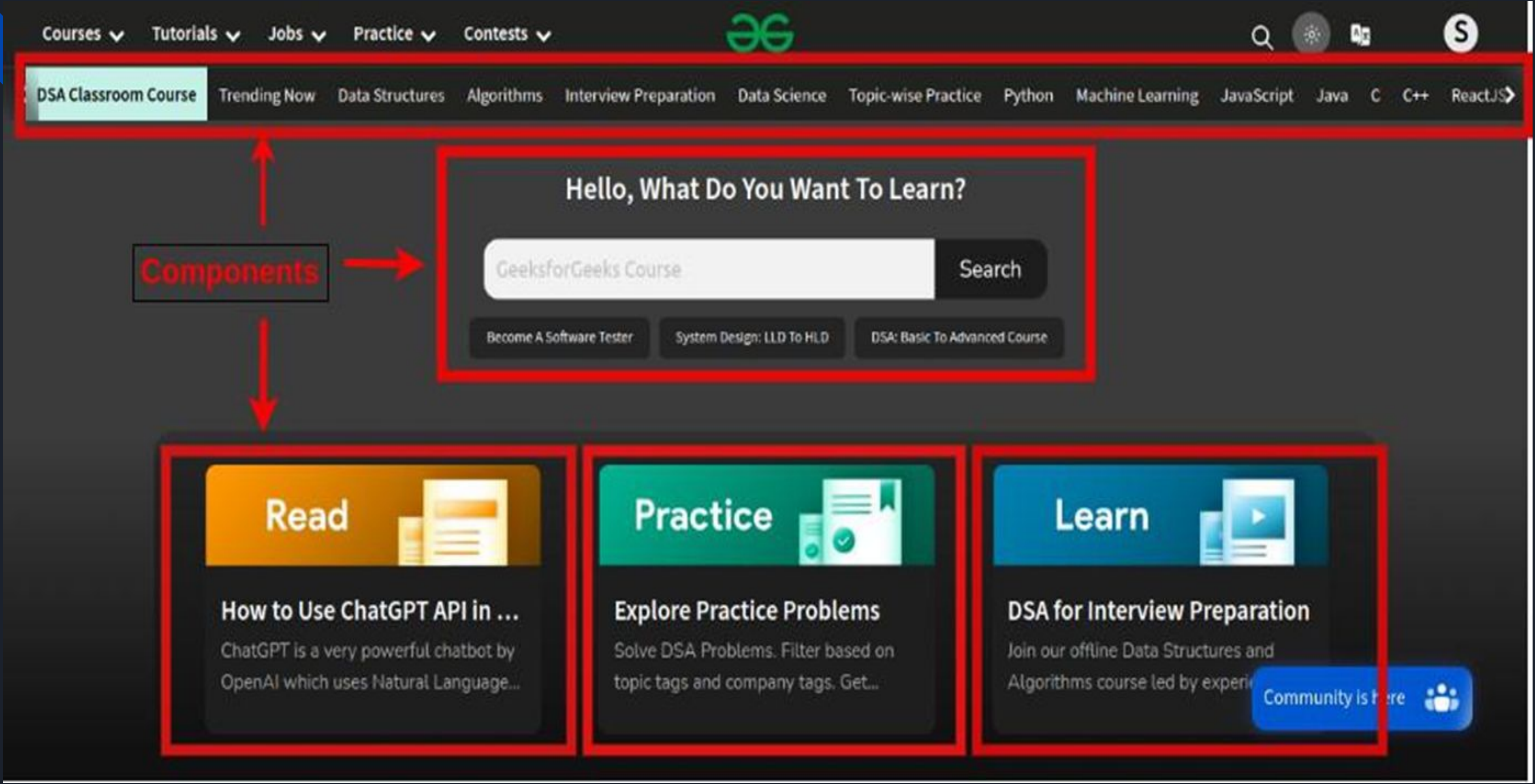
```
npm create vite@latest my-app

cd my-app

npm install

npm run dev
```

Components

What are components?

Components are the fundamental building blocks in React. They are reusable pieces of code that can be used to build elements on the page

- ❖ Reusable piece of code that can be used to build elements on the page
- ❖ Components can get props passed in and can hold own state
- ❖ Allows us to break down complex Uis, which make them easier to maintain and scale
- ❖ Components can be nested within other components, allowing you to build hierarchical and well-structured UIs.



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Community is here

```jsx
// App.jsx ;

function App() {

  return (
   <>
     <Header name="Omar" />
   </>
  )
}

 export default App
```

```jsx
// Header.jsx ;

const Header = ({name}) => {

  return (
   <div>
     <h1>Hello {name}</h1>
   </div>
  );
};

 export default Header;
```

State

What is State

- State is specific to a component and not shared directly with other components. This promotes isolation and prevents unintended side effects.
- This could be form input data, fetched data, UI-related data like if a modal is open/close
- State allows you to create dynamic, data-driven UIs

useState

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

 const Counter = () => {

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

   const handleClick = () => {
    setCount(count + 1);
  };

   return (
    <div>
      <p>You clicked {count} times</p>
      <button onClick={handleClick}>Click me</button>
    </div>
  );
};

 export default Counter;
```

onChange

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

 const NameInput = () => {
  const [name, setName] = useState(""); // Initialize state with an empty string

   const handleChange = (event) => {
    setName(event.target.value); // Update state with the input value
  };

   return (
    <div>
      <label>Enter your name:</label>
      <input
        type="text"
        value={name} // Set the input value to the current state
        onChange={handleChange} // Call handleChange on input change
      />
      <p>Hello, {name}!</p>
    </div>
  );
};

 export default NameInput;
```

Toggle state

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

 const Toggle = () => {
  const [isOn, setIsOn] = useState(false);

   const handleClick = () => {
    setIsOn(!isOn);
  };

   return (
    <button
      style={{ backgroundColor: isOn ? "green" : "red" }}
      onClick={handleClick}
    >
      {isOn ? "ON" : "OFF"}
    </button>
  );
};

 export default Toggle;
```

Let’s build our first app

App.jsx

```jsx
function App() {
  const [books, setBooks] = useState([
    { id: 1, title: "Clean Code", author: "Robert Cecil Martin" },
    { id: 2, title: "Design Patterns", author: "Erich Gamma" },
  ]);

   return (
    <>
      <Book books={books} />
    </>
  );
}
```

Book.jsx

```jsx
const Book = ({ books }) => {
  return (
    <div>
      {books.map((book) => (
        <div key={book.id}>
          <h1>{book.title}</h1>
          <h4>{book.author}</h4>
        </div>
      ))}
    </div>
  );
};

 export default Book;
```

Add title props

```
<Book books={books} title="All Books Here" />
```

Reusing Component

```
function App() {
  const [books, setBooks] = useState([
     { id: 1, title: "Clean Code", author: "Robert Cecil Martin" },
     { id: 2, title: "Design Patterns", author: "Erich Gamma" },
     { id: 3, title: "Contributing To Eclipse", author: "Erich Gamma" },
     { id: 4, title: "Secrets of the JavaScript Ninja", author: "John
Resig" },
  ]);

   return (
     <div className="App">
     <Book books={books} title="All Books Here" />
     <Book books={books.filter((book) => book.author == "Erich Gamma")}
     title="Erich Gamma Books Here"
     />
     </div>
  );
}
export default App;
```

Function props

Delete function

```
import Book from "./components/Book";

function App() {

  const [books, setBooks] = useState([
      { id: 1, title: "Clean Code", author: "Robert Cecil Martin" },
      { id: 2, title: "Design Patterns", author: "Erich Gamma" },
      { id: 3, title: "Contributing To Eclipse", author: "Erich Gamma" },
      { id: 4, title: "Secrets of the JavaScript Ninja", author: "John Resig"
},]);

  const handleDelete = (id) => {
      const newBooks = books.filter((book) => book.id !== id);
      setBooks(newBooks);};

  return (
      <div className="App">
      <Book books={books} title="All Books Here" handleDelete={handleDelete} />
      </div>
  );}

export default App;
```

```
// Book.jsx component


function Book({handleDelete}) {
  const books = props.books;
  return (
     <div>
     <h1>{props.title}</h1>
     {books.map((book) => (
     <div key={book.id}>
          <h2>{book.title}</h2>
          <h4>{book.author}</h4>
          <button onClick={() =>
handleDelete(book.id)}>Delete</button>
     </div>))}
     </div>
)}
export default Book;
```

Add function

```
 // in App.jsx we added addBook function and the UI to add a new Book :
const [title, setTitle] = useState("");
const [author, setAuthor] = useState("");

const addBook = () => {
  const newBook = {
    id: books.length + 1,
    title: title,
    author: author,
  };
  setBooks([...books, newBook]);
};
return (
  <>
    <div>
      <h2>Add a New Book</h2>
      <label>Title:</label>
      <input type="text" value={title} onChange={(e) => setTitle(e.target.value)}/>
      <label>Author:</label>
      <input type="text" value={author} onChange={(e) => setAuthor(e.target.value)}/>
      <button onClick={addBook}>Add Book</button>
    </div>
    <Book books={books} title="All Books Here" handleDelete={handleDelete} />
  </>
);
```

Update function

```jsx
// App.jsx

  const [Id, setId] = useState("");
  const [error, setError] = useState("");
  const [isEdit, setIsEdit] = useState(false);

  const handleEditClick = (book) => {
    setIsEdit(true);
    setTitle(book.title);
    setAuthor(book.author);
    setId(book.id);
  };

  const handleSave = () => {
    const updatedBook = {
      id: Id,
      title: title,
      author: author,
    };

    const updatedBooks = books.map((book) =>
      book.id === Id ? updatedBook : book
    );
    setBooks(updatedBooks);
  };
```

```
return (
  <>
    <div>
      {isEdit ? (
        <>
          <h2>Update a Book</h2>
          <label>Title:</label>
          <input
            type="text"
            value={title}
            onChange={(e) => setTitle(e.target.value)}
          />
          <label>Author:</label>
          <input
            type="text"
            value={author}
            onChange={(e) => setAuthor(e.target.value)}
          />
          <button onClick={() => handleSave()}>Save</button>
        </>
      ) :
```

```
(
          <div>
            <h2>Add a New Book</h2>
            <label>Title:</label>
            <input
              type="text"
              value={title}
              onChange={(e) => setTitle(e.target.value)}
            />
            <label>Author:</label>
            <input
              type="text"
              value={author}
              onChange={(e) => setAuthor(e.target.value)}
            />
            <button onClick={addBook}>Add Book</button>
            <p style={{ color: "red" }}>{error}</p>
          </div>
        )}
      </div>

      <Book
        books={books}
        title="All Books Here"
        handleDelete={handleDelete}
        handleEditClick={handleEditClick}
        isEdit={isEdit}
      />
    </>
  );
```

```
const Book = ({ books, title, handleDelete, handleEditClick }) => {

  return (
    <div className="bookContainer">
      <h1 className="bookTitle">{title}</h1>
      <ul className="bookList">
        {books.map((book) => (
          <li key={book.id} className="bookItem">
            <h2 className="bookItemTitle">{book.title}</h2>
            <h4 className="bookItemAuthor">{book.author}</h4>
            <button onClick={() => handleDelete(book.id)}>Delete</button>
            <button onClick={() => handleEditClick(book)}>Edit</button>
          </li>
        ))}
      </ul>
    </div>
  );
};

export default Book;
```

Higher Order Function

```
// map() :
```

- The map() method creates a new array by applying a function to each element of the original array.
- The map() method loop through each item it the array and every single time it does that it returns a value
- map() does not change the original array
- `array.map((currentValue, index)=>{... return value })`

```
// Exemple 1

const numbers = [1, 2, 3, 4, 5];

const doubledNumbers = numbers.map((num) => {
  return (
      num * 2
   );
}); // Double each number in the array
console.log(doubledNumbers); // Output: [2, 4, 6, 8, 10]

// Simplified
const doubledNumbers = numbers.map(num =>  num * 2);
```

```javascript
// Convert an Array of Strings to Uppercase

const words = ['hello', 'world', 'javascript', 'map'];

const uppercasedWords = words.map(word => word.toUpperCase());
// Output: ['HELLO', 'WORLD', 'JAVASCRIPT', 'MAP']


// Extract a Specific Property from an Array of Objects

const people = [
  { name: "Alice", age: 25 },
  { name: "Bob", age: 30 },
  { name: "Charlie", age: 35 },
];

const names = people.map((person) => person.name);
console.log(names); // Output: ['Alice', 'Bob', 'Charlie']
```

// Book.js

```
  const [books, setBooks] = useState([
    { id: 1, title: "Clean Code", author: "Robert Cecil Martin" },
    { id: 2, title: "Design Patterns", author: "Erich Gamma" },
    { id: 3, title: "Contributing To Eclipse", author: "Erich Gamma" },
    { id: 4, title: "Secrets of the JavaScript Ninja", author: "John Resig" },
  ]);


{books.map((book) => (
  <li key={book.id} className="bookItem">
   <h2 className="bookItemTitle">{book.title}</h2>
   <h4 className="bookItemAuthor">{book.author}</h4>
   <button onClick={() => handleDelete(book.id)}>Delete</button>
   <button onClick={() => handleEditClick(book)}>Edit</button>
  </li>
))}
```

```
const handleSave = () => {
  const updatedBook = {
    id: Id,
    title: title,
    author: author,
  };

  const updatedBooks = books.map((book) =>
    book.id === Id ? updatedBook : book
  );
  setBooks(updatedBooks);
};
```

// filter()

- the filter method will filter out the elements of an array based on the specified test condition
- The filter() method creates a new array filled with elements that pass a test provided by a function.
- The filter() method does not change the original array.
- `array.map((currentValue, index)=>{... return value })`

```
const words = ["Avocado", "Banana", "Apple", "Mango", "Kiwi", "Orange"];

const result = words.filter((word) => {
  return (
          word.length > 5
       )
});

console.log(result);

// Clean

const words = ["Avocado", "Banana", "Apple", "Mango", "Kiwi", "Orange"];

const result = words.filter(word => word.length > 5);

console.log(result);
```

```javascript
const numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10];

const evenNumbers = numbers.filter((number) => number % 2 === 0);

console.log(evenNumbers); // Output: [2, 4, 6, 8, 10]

// Object filter

const people = [
  { name: "Alice", age: 25 },
  { name: "Bob", age: 17 },
  { name: "Charlie", age: 19 },
];

const adults = people.filter((person) => person.age >= 18);

console.log(adults); // Output: [{ name: 'Alice', age: 25 }, { name: 'Charlie', age:
19 }]
```

```javascript
const products = [
  { name: 'Laptop', category: 'Electronics' },
  { name: 'Shirt', category: 'Clothing' },
  { name: 'Phone', category: 'Electronics' }
];

const electronics = products.filter(product => product.category === 'Electronics');

console.log(electronics); // Output: [{ name: 'Laptop', category: 'Electronics' }, { name:
'Phone', category: 'Electronics' }]
```

```
const [books, setBooks] = useState([
  { id: 1, title: "Clean Code", author: "Robert Cecil Martin" },
  { id: 2, title: "Design Patterns", author: "Erich Gamma" },
  { id: 3, title: "Contributing To Eclipse", author: "Erich Gamma" },
  { id: 4, title: "Secrets of the JavaScript Ninja", author: "John Resig" },
]);


const handleDelete = (id) => {
  const newBooks = books.filter((book) => book.id !== id);
  setBooks(newBooks);
};
```

Conditional Rendering

```
function Greeting() {
  const isLoggedIn = true;
  return (
    <div>{isLoggedIn ? <h1>Welcome back!</h1> : <h1>Please sign up.</h1>}</div>
  );
}

export default Greeting;
```

```
function Mailbox() {
  const unreadMessages = 5;
  return (
    <div>
      {unreadMessages > 0 && (
        <h2>You have {unreadMessages} unread messages.</h2>
      )}
    </div>
  );
}

export default Mailbox;
```

```jsx
{isEdit ? (
    <>
      <h2>Update a Book</h2>
      <label>Title:</label>
      <input
        type="text"
        value={title}
        onChange={(e) => setTitle(e.target.value)}
      />
      <label>Author:</label>
      <input
        type="text"
        value={author}
        onChange={(e) => setAuthor(e.target.value)}
      />
      <button onClick={() => handleSave()}>Save</button>
    </>
  ) : (
    <div>
      <h2>Add a New Book</h2>
      <label>Title:</label>
      <input
        type="text"
        value={title}
        onChange={(e) => setTitle(e.target.value)}
      />
      <label>Author:</label>
      <input
        type="text"
        value={author}
        onChange={(e) => setAuthor(e.target.value)}
      />
      <button onClick={addBook}>Add Book</button>
      <p style={{ color: "red" }}>{error}</p>
    </div>
  )}
```

useEffect

```
import { useState, useEffect } from "react";

 function App() {
  const [count, setCount] = useState(0);
  const increment = () => {
    setCount(count + 1);
  };
  const decrement = () => {
    setCount(count - 1);
  };

   useEffect(() => {
    console.log("use effect run");
  });

   return (
    <div className="App">
      <div>
        <h2>Counter: {count}</h2>
        <button onClick={increment}>Increment</button>
        <button onClick={decrement}>Decrement</button>
      </div>
    </div>
  );
}

 export default App;
```

```
import { useState, useEffect } from "react";

const UseEffectHook = () => {
  const [count, setCount] = useState(0);
  const [name, setName] = useState("");

  const increment = () => {
    setCount(count + 1);
  };
  const decrement = () => {
    setCount(count - 1);
  };

  const handleChange = (event) => {
    setName(event.target.value);
  };

  useEffect(() => {
    console.log("use effect run");
  }, [count]);

  return (
    <div className="App">
      <div>
        <h2>Counter: {count}</h2>
        <button onClick={increment}>Increment</button>
        <button onClick={decrement}>Decrement</button>
      </div>
      <label>Enter your name:</label>
      <input type="text" value={name} onChange={handleChange} />
      <p>Hello, {name}!</p>
    </div>
  );
};

export default UseEffectHook;
```

```
useEffect(() => {
  console.log("use effect run");
}, []);
useEffect(() => {
  console.log("count change");
}, [count]);
```

Primitives vs References

```javascript
// Primitives : number, String, Boolean, Null, Undefined

const x = 5;
const y = 5;

console.log(x === y); // output : true

const a = "React";
const b = "React";

console.log(a === b); // output : true

// Reference : Array, Object, Function

const a = [1, 2, 3];
const b = [1, 2, 3];

console.log(a === b); // output : false

const a = { value: 5 };
const b = { value: 5 };

console.log(a === b); // output : false
```

```jsx
import { useState, useEffect } from "react";
function App() {
  const [count, setCount] = useState(0);

  const a = 1;
  const b = [1,2,3];

  useEffect(() => {
    console.log("The useEffect hook runs when 'a' change occurs");
  }, [a]);

 useEffect(() => {
    console.log("The useEffect hook runs when 'b' change occurs");
  }, [b]);

  return (
    <div>
      <div>
        <p>
          Count: <span id="count">{count}</span>
        </p>

        <button onClick={() => setCount(count + 1)}>Increment</button>
      </div>
    </div>
  );
}
export default App;
```

axios

https://freetestapi.com/apis/books

/books	Get	Fetch all books
/books/{id}	Get	Fetch a single book
/books	Post	Add a new book
/books/{id}	Delete	Delete a book

```
const Book = () => {
  const [books, setBooks] = useState([]);

  useEffect(() => {
    axios
      .get("https://freetestapi.com/api/v1/books")
      .then(({ data }) => {
        console.log(data);
      })
      .catch((error) => {
        console.log(error);
      });
  }, []);

  useEffect(() => {
    async function getBooks() {
      const response = await axios.get("https://freetestapi.com/api/v1/books");
      console.log(response.data);
      setBooks(response.data);
    }
    getBooks();
  }, []);
```

Thanks for your attention

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