README

React Documentation

- prerequisities: HTML, CSS, Javascript
- React.js official Site
- some API for http requests - dummy json - pagination testing

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1. Basic React.js Topics

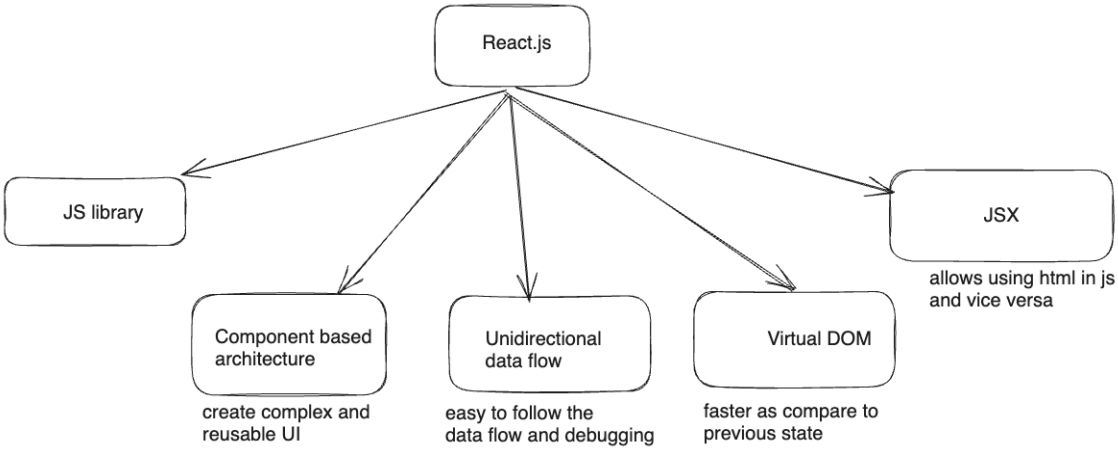
1.1 Introduction to React

What is React?

- React is an open-source JavaScript library for building user interfaces. It was developed in 2013 and is maintained by Facebook. React is known for its performance, flexibility, and component-based architecture, which allows developers to build reusable UI components and efficiently manage the state of an application.

Why React / Features of React.js

- high demand for front-end jobs
- you can build mobile (react native), desktop (Electron) and web application
- Electron is a framework for building desktop applications using web technologies such as JavaScript, HTML, and CSS. It can be used as the runtime environment for a React application. Electron allows React applications to run on desktop operating systems such as Windows, macOS, and Linux.



Here are some key features and concepts associated with React:

1. **Component-Based:** React applications are built using components, which are self-contained, reusable building blocks for user interfaces. It helps us to create reusable components (small and isolated pieces of code using html, css, js). It helps us to render UI. Think about youtube's website
    - Single Page Application (SPA) allows us to render as much as we need for reducing unnecessary rendering such as loading navbar, footer etc. in all the pages
    - think about html tag and creating your own tag with react
2. **Virtual DOM:** React uses a virtual representation of the DOM (Document Object Model) to optimize updates. Instead of directly manipulating the actual DOM, React compares changes in the virtual DOM and efficiently updates only the necessary parts of the real DOM, reducing rendering time and improving performance.
    - Load fast - Why React.js is faster? - virtual DOM compares with previous states
3. **Declarative Syntax:** React uses a declarative approach to building UIs. Developers describe what the UI should look like based on the application's state, and React takes care of updating the DOM to match that state.
4. **Unidirectional Data Flow:** React enforces a one-way data flow, which means data flows down the component hierarchy from parent components to child components. This helps maintain predictable and debugable code.
5. **JSX (JavaScript XML):** React allows you to write UI components using JSX, which is a syntax extension for JavaScript. JSX allows you to write HTML-like code within your JavaScript files, making it easier to define UI elements.

6. **Component Lifecycle:** React components have lifecycle methods that allow developers to hook into specific points in a component's lifecycle, such as when it's mounted or updated. This is useful for performing actions like data fetching, initialization, or cleanup.
7. **State Management:** React provides a mechanism for managing component-specific state using the `useState` hook for functional components and `setState` for class components. For global state management, libraries like Redux or React Context can be used.
8. **Routing:** React can be used in combination with routing libraries like React Router to create single-page applications with client-side routing.
9. **Community and Ecosystem:** React has a large and active community, which has led to the development of a rich ecosystem of third-party libraries and tools to enhance development and improve productivity.
10. **Example of React app and competitors** - facebook, twitter, airbnb, netflix etc. competitor: Vue.js, Angular (more full-fledged / developed no need 3rd party library just like react-router-dom)

Overall, React is a powerful and popular choice for building modern web applications, and it's widely adopted by developers and organizations for its efficiency and developer-friendly approach to UI development.

Prerequisites

- HTML, CSS, JS

Environment setup

- VSCode (code editor)
- node.js (Download LTS: Long Term Support one) (npm is included in node.js by default)
- React Developer tools extensions for google, firefox, edge
- Extension: ES7 react, JS JSX snippets + "editior.snipperSuggestions": "top", react developer tools, material theme, setup eslint and prettier

First react app

Method 1: create and run react app with npx

```
// create react app command
npx create-react-app appName

// run react app command
cd appName
npm start
```

Method 2: create react app with bundler with vite `npm create vite@latest` swc(speedy web compiler)

- `npx create vite@latest . --template react`

Code Example - 1 (create React app)

```
// Code Example - 1 (create React app)
import React from 'react';
import ReactDOM from 'react-dom/client';

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>Anis Express</React.StrictMode>
);
```

Understand File structure

- discuss about package.json, node_modules, public, src
- package-lock.json is for version control for packages. it keeps the record of node_modules tree so that when you clone and use npm i it will install exactly same versions for the packages even though their is a new versions. if you do not have package-lock.json then it will install from package.json
- keep only the index.js in src and then play with React.js
- change the title of the app inside index.html file

1.2 JSX and JS Expression

JSX: stands for JavaScript XML which allows us to use write html-like syntax inside javascript and vice versa. react module has babbel inside of it that helps us to run jsx. JSX is similar like HTML but it is more dynamic. JSX and React are independent things and they can be used independently.

Rules for JSX

1. **We can return single element using JSX, for multiple elements we can use a wrapper. We can also use Fragment here.**
    - why we can not return multiple elements in JSX needs to be rendered? jsx is javascript object and we can not return 2 objects from a function so we need to use array syntax and wrap everything inside one array.
        - Code Example - 2 (render single element)

```
// Code Example - 2 (render single element)
import React from 'react';
import ReactDOM from 'react-dom/client';
```

```
const root = ReactDOM.createRoot(document.getElementById('root'));
root.render(<h1>Anis Express</h1>);
```

- React render function can render only one element

```
// Code Example - 3 (Rendering multiple elements)
import React from 'react';
import ReactDOM from 'react-dom/client';

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    <div>
      <header>
        <h1>Anis Express</h1>
      </header>
      <main>
        <aside>
          <h3>Add Filter By Price</h3>
          <h3>Add Filter By Categories</h3>
        </aside>
        <section>
          <article>product info goes here</article>
        </section>
      </main>
      <footer>
        <p>Copyright by @Anisul Islam</p>
      </footer>
    </div>
  </React.StrictMode>
);
```

- React.Fragment or <> </> helps us to avoid div soup or unnecessary div nesting.

```
// Code Example - 4 (Fragment)
import React, { Fragment } from 'react';

import ReactDOM from 'react-dom/client';

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    <Fragment>
      <header>
        <h1>Anis Express</h1>
      </header>
      <main>
        <aside>
          <h3>Add Filter By Price</h3>
          <h3>Add Filter By Categories</h3>
        </aside>
        <section>
          <article>product info goes here</article>
        </section>
      </main>
      <footer>
        <p>Copyright by @Anisul Islam</p>
      </footer>
    </Fragment>
  </React.StrictMode>
);
```

2. Remember to close all tags - `<img />`
3. Camelcase - className, FunctionName

We can use Javascript expression inside JSX

```
// Code Example - 5 (JS Expressions in JSX)

import React, { Fragment } from 'react';
import ReactDOM from 'react-dom/client';

// get 5 products from fakestore api
export const productsData = [
  {
    id: 1,
    title: 'Fjallraven - Foldsack No. 1 Backpack, Fits 15 Laptops',
    price: 109.95,
    description:
      'Your perfect pack for everyday use and walks in the forest. Stash your laptop (up to 15 inches) in the padded sleeve, yo
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/81fPKd-2AYL._AC_SL1500_.jpg',
    rating: {
      rate: 3.9,
      count: 120,
    },
  },
  {
    id: 2,
    title: 'Mens Casual Premium Slim Fit T-Shirts ',
    price: 22.3,
```

```
    description:
      'Slim-fitting style, contrast raglan long sleeve, three-button henley placket, light weight & soft fabric for breathable a
    category: "men's clothing",
    image:
      'https://fakestoreapi.com/img/71-3HjGNDUL._AC_SY879._SX._UX._SY._UY_.jpg',
    rating: {
      rate: 4.1,
      count: 259,
    },
  },
  {
    id: 3,
    title: 'Mens Cotton Jacket',
    price: 55.99,
    description:
      'great outerwear jackets for Spring/Autumn/Winter, suitable for many occasions, such as working, hiking, camping, mountair
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/71li-ujtlUL._AC_UX679_.jpg',
    rating: {
      rate: 4.7,
      count: 500,
    },
  },
  {
    id: 4,
    title: 'Mens Casual Slim Fit',
    price: 15.99,
    description:
      'The color could be slightly different between on the screen and in practice. / Please note that body builds vary by pers
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/71YXzeOuslL._AC_UY879_.jpg',
    rating: {
      rate: 2.1,
      count: 430,
    },
  },
  {
    id: 5,
    title:
      "John Hardy Women's Legends Naga Gold & Silver Dragon Station Chain Bracelet",
    price: 695,
    description:
      "From our Legends Collection, the Naga was inspired by the mythical water dragon that protects the ocean's pearl. Wear fa
    category: 'jewelery',
    image: 'https://fakestoreapi.com/img/71pWzhdJNwL._AC_UL640_QL65_ML3_.jpg',
    rating: {
      rate: 4.6,
      count: 400,
    },
  },
];

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    <Fragment>
      <header>
        <h1>Anis Express</h1>
      </header>
      <main>
        <aside>
          <h3>Add Filter By Price</h3>
          <h3>Add Filter By Categories</h3>
        </aside>
        <section>
          <article>
            <img src={productsData[0].image} alt={productsData[0].title} />
            <h2>{productsData[0].id}</h2>
            <p>{productsData[0].title}</p>
            <p>{productsData[0].description}</p>
            <p>Price: {productsData[0].price}</p>
            <p>Category: {productsData[0].category}</p>
            <p>Rating: {productsData[0].rating.rate}/5</p>
          </article>

          <article>
            <img src={productsData[1].image} alt={productsData[1].title} />
            <h2>{productsData[1].id}</h2>
            <p>{productsData[1].title}</p>
            <p>{productsData[1].description}</p>
            <p>Price: {productsData[1].price}</p>
            <p>Category: {productsData[1].category}</p>
            <p>Rating: {productsData[1].rating.rate}/5</p>
          </article>
        </section>
      </main>
      <footer>
        <p>Copyright by @Anisul Islam</p>
      </footer>
    </Fragment>
  </React.StrictMode>
);
```

1.3 Component

- **Component: A *reusable*, *nestable building block* constrcut with mainly Javascript function and HTML; CSS can be added**
  - Component VS Function: Component should always start with capital letter and return JSX
  - There are 2 main types of components: functional component and class component
  - keep a blank line when importing your components for separating built in modules

```
// Code Example 6 - Create a reusable functional component for Header, Sidebar, Footer, Products,

// Create App.jsx component and move everything there and start doing decomposition

// Create Page: pages/Home.jsx page

// components/Header.jsx
import React from 'react';
const Header = () => {
  return (
    <header>
      <h1>Anis Express</h1>
    </header>
  );
};
export default Header;

// components/Sidebar.jsx
import React from 'react';
const Sidebar = () => {
  return (
    <aside>
      <h3>Add Filter By Price</h3>
      <h3>Add Filter By Categories</h3>
    </aside>
  );
};
export default Sidebar;

// components/Products.jsx
import React from 'react';

export const productsData = [
  {
    id: 1,
    title: 'Fjallraven - Foldsack No. 1 Backpack, Fits 15 Laptops',
    price: 109.95,
    description:
      'Your perfect pack for everyday use and walks in the forest. Stash your laptop (up to 15 inches) in the padded sleeve
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/81fPKd-2AYL._AC_SL1500_.jpg',
    rating: {
      rate: 3.9,
      count: 120,
    },
  },
  {
    id: 2,
    title: 'Mens Casual Premium Slim Fit T-Shirts ',
    price: 22.3,
    description:
      'Slim-fitting style, contrast raglan long sleeve, three-button henley placket, light weight & soft fabric for breatha
    category: "men's clothing",
    image:
      'https://fakestoreapi.com/img/71-3HjGNDUL._AC_SY879._SX._UX._SY._UY_.jpg',
    rating: {
      rate: 4.1,
      count: 259,
    },
  },
  {
    id: 3,
    title: 'Mens Cotton Jacket',
    price: 55.99,
    description:
      'great outerwear jackets for Spring/Autumn/Winter, suitable for many occasions, such as working, hiking, camping, mou
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/71li-ujtlUL._AC_UX679_.jpg',
    rating: {
      rate: 4.7,
      count: 500,
    },
  },
  {
    id: 4,
    title: 'Mens Casual Slim Fit',
    price: 15.99,
    description:
      'The color could be slightly different between on the screen and in practice. / Please note that body builds vary by
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/71YXzeOuslL._AC_UY879_.jpg',
    rating: {
      rate: 2.1,
      count: 430,
    },
```

```
  },
  {
    id: 5,
    title:
      "John Hardy Women's Legends Naga Gold & Silver Dragon Station Chain Bracelet",
    price: 695,
    description:
      "From our Legends Collection, the Naga was inspired by the mythical water dragon that protects the ocean's pearl. Wea
    category: 'jewelery',
    image: 'https://fakestoreapi.com/img/71pWzhdJNwL._AC_UL640_QL65_ML3_.jpg',
    rating: {
      rate: 4.6,
      count: 400,
    },
  },
];

const Products = () => {
  return (
    <section>
      <article>
        <img src={productsData[0].image} alt={productsData[0].title} />
        <h2>{productsData[0].id}</h2>
        <p>{productsData[0].title}</p>
        <p>{productsData[0].description.substring(0,50)...}</p>
        <p>Price: {productsData[0].price}</p>
        <p>Category: {productsData[0].category}</p>
        <p>Rating: {productsData[0].rating.rate}/5</p>
      </article>

      <article>
        <img src={productsData[1].image} alt={productsData[1].title} />
        <h2>{productsData[1].id}</h2>
        <p>{productsData[1].title}</p>
        <p>{productsData[0].description.substring(0,50)...}</p>
        <p>Price: {productsData[1].price}</p>
        <p>Category: {productsData[1].category}</p>
        <p>Rating: {productsData[1].rating.rate}/5</p>
      </article>
    </section>
  );
};
export default Products;

// components/Footer.jsx
import React from 'react';
const Footer = () => {
  return (
    <footer>
      <p>Copyright by @Anisul Islam</p>
    </footer>
  );
};
export default Footer;

// Home.jsx
import React from 'react';

import Sidebar from '../components/Sidebar';
import Products from '../components/Products';
const Home = () => {
  return (
    <div>
      <Sidebar />
      <div>
        <Products />
      </div>
    </div>
  );
};
export default Home;

// App.jsx
import React, { Fragment } from 'react';

import Sidebar from './components/Sidebar';
import Products from './components/Products';
import Footer from './components/Footer';
import Header from './components/Header';

const App = () => {
  return (
    <Fragment>
      <Header />
      <main>
       <Home/>
      </main>
      <Footer />
    </Fragment>
  );
};
export default App;
```

Code Example - 7 (export, import modular component)

- export default can be used once in a file where multiple exports can be used
- importing export default does not require {} and you can name anything on the other hand only exports requires {} and naming is strict

```
// src/data.js
export const productsData = [
  {
    id: 1,
    title: 'Fjallraven - Foldsack No. 1 Backpack, Fits 15 Laptops',
    price: 109.95,
    description:
      'Your perfect pack for everyday use and walks in the forest. Stash your laptop (up to 15 inches) in the padded sleeve, yo
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/81fPKd-2AYL._AC_SL1500_.jpg',
    rating: {
      rate: 3.9,
      count: 120,
    },
  },
  {
    id: 2,
    title: 'Mens Casual Premium Slim Fit T-Shirts ',
    price: 22.3,
    description:
      'Slim-fitting style, contrast raglan long sleeve, three-button henley placket, light weight & soft fabric for breathable
    category: "men's clothing",
    image:
      'https://fakestoreapi.com/img/71-3HjGNDUL._AC_SY879._SX._UX._SY._UY_.jpg',
    rating: {
      rate: 4.1,
      count: 259,
    },
  },
  {
    id: 3,
    title: 'Mens Cotton Jacket',
    price: 55.99,
    description:
      'great outerwear jackets for Spring/Autumn/Winter, suitable for many occasions, such as working, hiking, camping, mountai
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/71li-ujtlUL._AC_UX679_.jpg',
    rating: {
      rate: 4.7,
      count: 500,
    },
  },
  {
    id: 4,
    title: 'Mens Casual Slim Fit',
    price: 15.99,
    description:
      'The color could be slightly different between on the screen and in practice. / Please note that body builds vary by pers
    category: "men's clothing",
    image: 'https://fakestoreapi.com/img/71YXzeOuslL._AC_UY879_.jpg',
    rating: {
      rate: 2.1,
      count: 430,
    },
  },
  {
    id: 5,
    title:
      "John Hardy Women's Legends Naga Gold & Silver Dragon Station Chain Bracelet",
    price: 695,
    description:
      "From our Legends Collection, the Naga was inspired by the mythical water dragon that protects the ocean's pearl. Wear fa
    category: 'jewelery',
    image: 'https://fakestoreapi.com/img/71pWzhdJNwL._AC_UL640_QL65_ML3_.jpg',
    rating: {
      rate: 4.6,
      count: 400,
    },
  },
];

// components/Products.js
import React from 'react';

import { productsData } from '../data';

const Products = () => {
  return (
    <section>
      <article>
        <img src={productsData[0].image} alt={productsData[0].title} />
        <h2>{productsData[0].id}</h2>
        <p>{productsData[0].title}</p>
        <p>{productsData[0].description}</p>
        <p>Price: {productsData[0].price}</p>
        <p>Category: {productsData[0].category}</p>
        <p>Rating: {productsData[0].rating.rate}/5</p>
      </article>
```

```
      <article>
        <img src={productsData[1].image} alt={productsData[1].title} />
        <h2>{productsData[1].id}</h2>
        <p>{productsData[1].title}</p>
        <p>{productsData[1].description}</p>
        <p>Price: {productsData[1].price}</p>
        <p>Category: {productsData[1].category}</p>
        <p>Rating: {productsData[1].rating.rate}/5</p>
      </article>
    </section>
  );
};

export default Products;
```

How React works under the hood

- Code Example - 8 (React under the hood)

```
const Message = () => {
  // return <h3>Message </h3>;
  return React.createElement('h1', {}, 'welcome');
};

const Todo = () => {
  return (
    // <article>
    //   <h2>Check students attendance</h2>
    //   <p>
    //     Lorem ipsum dolor sit amet consectetur adipisicing elit. Ab, molestiae.
    //   </p>
    // </article>

    React.createElement(
      'article',
      {},
      React.createElement('h2', {}, 'Check students attendance'),
      React.createElement(
        'p',
        {},
        ' Lorem ipsum dolor sit amet consectetur adipisicing elit. Ab, molestiae.'
      )
    )
  );
};
```

1.4 Adding CSS & SASS Styling

- DO NOT FOCUS ON STYLING CAUSE IT IS NOT A CSS OR STYLING SERIES. Copy the css code and paste it.
- i. Inline styling

```
const headingStyle = { color: 'red', fontSize: '3rem' };
<aside style={headingStyle}>sidebar goes here</aside>;
```

- ii. CSS Stylesheet / global CSS
  - Code Example - 9 (Styling component with CSS)

```
 /*reset code and common ends here*/

/* reset and common styles */

 :root {
   --primary-color: #4CAF50;
   --secondary-color: #2E7D32;
   --background-color: #f5f5f5;
   --text-color: #333;
   --padding: 1rem;
   --transition: all 0.3s ease;
   --border-radius: 0.5rem;
   --box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
  }

  - {
    box-sizing: border-box;
    margin: 0;
    padding: 0;
    text-decoration: none;
    list-style: none;
    outline: none;
  }

  body {
    font-family: 'Arial', sans-serif;
    background-color: var(--background-color);
    color: var(--text-color);
    margin: 0;
```

```
}

h1, h2, h3, p {
  margin-bottom: 1rem;
}

img {
  max-width: 100%;
  display: block;
  border-radius: var(--border-radius);
}


html {
  scroll-behavior: smooth;
}

.flex-space-around {
  display: flex;
  justify-content: space-around;
  align-items: center;
}

.flex-center {
  display: flex;
  justify-content: center;
  align-items: center;
}

img {
  width: 100%;
  height: auto;
  object-fit: contain;
}

/_reset code and common ends here_/

/_header starts here_/
.header {
  height: 10vh;
  background-color: var(--primary-color);
  color: white;
  display: flex;
  align-items: center;
  justify-content: space-between;
  padding: 0 2rem;
}
/_header ends here_/

/_main starts here_/
main {
  height: 80vh;
  padding: 2rem;
  overflow: scroll;
}

.container {
  display: flex;
  gap: 2rem;
}

.sidebar {
  flex: 1;
  padding: var(--padding);
  display: flex;
  flex-direction: column;
  gap: 1rem;
  background-color: white;
  border: 1px solid var(--primary-color);
  border-radius: var(--border-radius);
  box-shadow: var(--box-shadow);
}

.main-content {
  flex: 3;
  padding: var(--padding);
}

.products {
  display: grid;
  /* grid-template-columns: repeat(3, minmax(0, 1fr)); */
  grid-template-columns: repeat(auto-fit, minmax(250px, 1fr));
  gap: 2rem;
  padding: 1rem;
}


/* Card component styles */

.card {
  background-color: white;
  border-radius: var(--border-radius);
  box-shadow: var(--box-shadow);
  overflow: hidden;
```

```
  transition: var(--transition);
}

.card:hover {
  transform: scale(1.02);
}


.product__img {
  width: 100%;
  height: 15rem;
  object-fit: cover;
  border-radius: var(--border-radius);
}

.product__title {
  font-size: 1.2rem;
  font-weight: bold;
  margin: 0.5rem 0;
}

.product__description {
  font-size: 0.9rem;
  color: var(--secondary-color);
  margin: 0.5rem 0;
}

.product__price {
  font-size: 1rem;
  color: var(--primary-color);
  font-weight: bold;
  margin: 0.5rem 0;
}

.button {
  background-color: var(--primary-color);
  color: white;
  padding: 0.5rem 1rem;
  border: none;
  border-radius: var(--border-radius);
  cursor: pointer;
  transition: var(--transition);
}

.button:hover {
  background-color: var(--secondary-color);
}
/_main ends here_/

/_footer starts here_/
.footer {
  height: 10vh;
  padding: var(--padding);
  background-color: var(--primary-color);
  color: white;
  font-size: 1.1rem;
  display: flex;
  justify-content: space-between;
  align-items: center;
  padding: 0 2rem;
}

.footer a {
  color: white;
  font-weight: bold;
}

.footer .social-media a {
  margin: 0 0.5rem;
  font-size: 1.2rem;
}
/_footer ends here_/

/_responsiveness starts here_/
@media (max-width: 992px) {
  .flex-space-around,
  .flex-center {
    flex-direction: column;
    gap: 1rem;
  }
  .header {
    flex-direction: column;
    padding: 1rem 0;
  }
  .sidebar {
    width: 100%;
  }
  .products {
    grid-template-columns: repeat(2, minmax(0, 1fr));
  }
}

@media (max-width: 768px) {
  .products {
```

```
      grid-template-columns: repeat(1, minmax(0, 1fr));
    }
  }
  /_responsiveness ends here_/
```

```
// Code Example - 9 (Styling component with CSS)
import React from 'react';

import Sidebar from '../components/Sidebar';
import Products from '../components/Products';

const Home = () => {
  return (
    <div className="container flex-space-around">
      <Sidebar />
      <div className="main-content">
        <Products />
      </div>
    </div>
  );
};

export default Home;
```

- iii. CSS module: create a file name such as fileName.module.css as shown below

  CSS Modules offer a robust solution for styling React components by providing scoped styles, preventing global namespace pollution, and making it easier to maintain and manage styles in large applications. They align well with the modular nature of React components and help ensure that styles are predictable and encapsulated.

  - Benefits of Using CSS Modules in React

    a. **Scoped Styles**:

    - CSS Modules automatically scope the CSS to the component it is imported into. This prevents styles from one component from unintentionally affecting styles in another component.
    - This is particularly useful in large applications where naming conflicts can be a common issue.

    b. **Avoid Global Namespace**:

    - Traditional CSS is global, meaning that all class names are in the global namespace. CSS Modules mitigate this by generating unique class names for each component, thus avoiding the risk of naming conflicts.

    c. **Easier Maintenance**:

    - Scoped styles make it easier to maintain and update the CSS for individual components without worrying about side effects on other parts of the application.
    - This modular approach aligns with the component-based architecture of React.

    d. **Improved Readability**:

    - CSS Modules can lead to better-organized code. Styles are co-located with the component logic, making it easier to see how a component is styled without needing to search through a large, separate CSS file.

    e. **Dynamic Class Names**:

    - CSS Modules support dynamic class names, allowing you to conditionally apply styles based on component state or props.
    - This can simplify the process of applying different styles based on user interaction or other conditions.

    f. **Integration with CSS Preprocessors**:

    - CSS Modules can be used with CSS preprocessors like Sass or Less, allowing you to leverage their features (e.g., variables, mixins) while still benefiting from scoped styles.

  - How to Use CSS Modules in React

    a. **Create a CSS Module File**: Create a CSS file with the `.module.css` extension (e.g., `Button.module.css`).

```
/* Button.module.css */
.button {
  background-color: #4caf50;
  color: white;
  padding: 10px 20px;
  border: none;
  border-radius: 5px;
  cursor: pointer;
}

.button:hover {
  background-color: #45a049;
}
```

    b. **Import and Use the CSS Module in a React Component**: Import the CSS Module into your React component and use it.

```
// Button.js
import React from 'react';
import styles from './Button.module.css';

const Button = ({ children, onClick }) => {
```

```
  return (
    <button className={styles.button} onClick={onClick}>
      {children}
    </button>
  );
};

export default Button;
```

c. **Dynamic Class Names**: You can conditionally apply class names using the `classnames` library or template literals.

```
import React from 'react';
import styles from './Button.module.css';
import classnames from 'classnames';

const Button = ({ children, onClick, primary }) => {
  return (
    <button
      className={classnames(styles.button, {
        [styles.primary]: primary,
      })}
      onClick={onClick}
    >
      {children}
    </button>
  );
};

export default Button;
```

- adding multiple class in modules In React, when using CSS Modules, you can add multiple class names to an element by combining them using the `classnames` library or by using template literals. Both approaches allow you to conditionally apply multiple class names based on certain conditions.
  - Using the `classnames` Library

  The `classnames` library is a popular utility for conditionally combining class names. It simplifies the process of adding multiple classes and is particularly useful when you need to apply classes conditionally.

  a. **Install the `classnames` Library**:

  You can install the `classnames` library via npm or yarn:

  ```
  npm install classnames
  ```

  or

  ```
  yarn add classnames
  ```

  b. **Combine Classes Using `classnames`**:

  Here's an example demonstrating how to use `classnames` with CSS Modules:

  ```
  // Button.js
  import React from 'react';
  import classnames from 'classnames';
  import styles from './Button.module.css';

  const Button = ({ children, onClick, primary, secondary }) => {
    const buttonClass = classnames(styles.button, {
      [styles.primary]: primary,
      [styles.secondary]: secondary,
    });

    return (
      <button className={buttonClass} onClick={onClick}>
        {children}
      </button>
    );
  };

  export default Button;
  ```

  ```
  /* Button.module.css */
  .button {
    padding: 10px 20px;
    border: none;
    border-radius: 5px;
    cursor: pointer;
  }

  .primary {
    background-color: #4caf50;
    color: white;
  }

  .secondary {
  ```

```
  background-color: #008cba;
  color: white;
}
```

- Using Template Literals

If you prefer not to use an additional library, you can also use JavaScript template literals to combine class names.

a. **Combine Classes Using Template Literals**:

Here's an example demonstrating how to use template literals with CSS Modules:

```
// Button.js
import React from 'react';
import styles from './Button.module.css';

const Button = ({ children, onClick, primary, secondary }) => {
  const buttonClass = `${styles.button} ${primary ? styles.primary : ''} ${secondary ? styles.secondary : ''}`;

  return (
    <button className={buttonClass} onClick={onClick}>
    <button className={`${style.title1} ${style.title2}`} onClick={onClick}>
      {children}
    </button>
  );
};

export default Button;
```

```
/* Button.module.css */
.button {
  padding: 10px 20px;
  border: none;
  border-radius: 5px;
  cursor: pointer;
}

.primary {
  background-color: #4caf50;
  color: white;
}

.secondary {
  background-color: #008cba;
  color: white;
}
```

- iv. SASS
  - sass official doc
  - my sass doc

```
# .scss and .sass

npm add -D sass

# .less

npm add -D less

# .styl and .stylus

npm add -D stylus
```

  - create scss file

```
.product {
  background: #000;
  .product__title {
    color: red;
  }
  .product-desc {
    color: green;
  }
}
```

  - use it from component

```
import React from 'react';
import PropTypes from 'prop-types';

import styles from './product.module.scss';

const Product = (props) => {
  const { product } = props;
  return (
    <article className={styles.product}>
      <img className="product__img" src={product.image} alt={product.title} />
      <p className={styles.product__title}>{product.title}</p>
      <p className={styles['product-desc']}>
        {' '}
```

```
        // for accessing kebab case use []
        {product.description.substring(0, 40)}
        ...
      </p>
    </article>
  );
};
```

1.5 Props and destructuring

- **props object: Properties are called as props. we can pass information from one component to another using props object. components communicate with each others via props. props is an object. props are like attributes in our HTML tag. props are readonly**
  - how to pass, receive, set default props
  - how to pass JSX to component,
- **Code Example - 10 (Props sending)**

```
// component without props is flexible?
import React from 'react';
const Message = () => {
  return <div>Anisul Islam you have received 12 messages</div>;
};
export default Message;

import React, { Fragment } from 'react';
import Message from './components/Message';
const App = () => {
  return (
    <Fragment>
      <Message />
    </Fragment>
  );
};

export default App;

// lets pass data to components
// pass number  num={12}
// pass string num="12"
// pass boolean bool="true"; String(props.bool)
// pass object
// pass array
import React, { Fragment } from 'react';
import Message from './components/Message';
const App = () => {
  return (
    <Fragment>
       <Message numberOfMessages={12} name="Anisul Islam" />
    </Fragment>
  );
};
export default App;

import React from 'react';
const Message = (props) => {
  return (
    <div>{props.name} you have received {props.numberOfMessages} messages</div>
  );
};
export default Message;

// destructure method 1
import React from 'react';
const Message = (props) => {
  const {name, numberOfMessages} = props;
  return (
    <div>{props.name} you have received {props.numberOfMessages} messages</div>
  );
};
export default Message;

// destructure method 2
import React from 'react';
const Message = ({name, numberOfMessages}) => {
  return (
    <div>{props.name} you have received {props.numberOfMessages} messages</div>
  );
};
export default Message;
```

- create data.js in src folder and move all the products dummy data there and import in Home.js for passing it as props to Products component.
- **Code Example - 11 (props and destructure complex example)**

```
// data.js

// Home.js
import React from 'react';

import Sidebar from '../components/Sidebar';
```

```
import Products from '../components/Products';
import { products } from '../data';

const Home = () => {
  return (
    <div className="container flex-space-around">
      <Sidebar />
      <div className="main-content">
        <Products products={products} />
      </div>
    </div>
  );
};
export default Home;


// Products.js
import React from 'react';
const Products = (props) => {
  const { products } = props;

  return (
    <section className="products">
      <article className="product card">
        <img
          className="product__img"
          src={products[0].image}
          alt={products[0].title}
        />
        <h2>{products[0].id}</h2>
        <p className="product__title">{products[0].title}</p>
        <p className="product__description">
          {products[0].description.substring(0, 80)}
          ...
        </p>
        <p className="product__price">Price: {products[0].price}</p>
        <p>Category: {products[0].category}</p>
        <p>Rating: {products[0].rating.rate}/5</p>
      </article>

      <article className="product card">
        <img
          className="product__img"
          src={products[1].image}
          alt={products[1].title}
        />
        <h2>{products[1].id}</h2>
        <p className="product__title">{products[1].title}</p>
        {products[1].description.substring(0, 80)}...
        <p className="product__price">Price: {products[1].price}</p>
        <p>Category: {products[1].category}</p>
        <p>Rating: {products[1].rating.rate}/5</p>
      </article>
    </section>
  );
};

export default Products;
```

- Code Example - 12 (more decomposition example)

```
// Product.jsx
import React from 'react';

const Product = (props) => {
  const { product } = props;
  return (
    <article className="product card">
      <img className="product__img" src={product.image} alt={product.title} />
      <p className="product__title">{product.title}</p>
      <p className="product__description">
        {product.description.substring(0, 40)}
        ...
      </p>
      <p className="product__price">Price: {product.price}</p>
      <p>Category: {product.category}</p>
      <p>Rating: {product.rating.rate}/5</p>
    </article>
  );
};

export default Product;


// Products.jsx
import React from 'react';
import Product from './Product';

const Products = (props) => {
  const { products } = props;

  return (
    <section className="products">
```

```
      <Product product={products[0]} />
      <Product product={products[1]} />
      <Product product={products[2]} />
      <Product product={products[3]} />
      <Product product={products[4]} />
    </section>
  );
};

export default Products;
```

1.6 prop-types

- documentation is here
- **catch bugs with typechecking.**
- We can use Typescript or Flow for checking types in the entire application for sure but use the prop-types library can be the first guard here for checking types.
- how to use the library
- **Code Example - 13 (prop-types)**

```
// Products.jsx
import React from 'react';

  import PropTypes from 'prop-types';

  import Product from './Product';

  const Products = (props) => {
    const { products } = props;

    return (
      <section className="products">
        <Product product={products[0]} />
        <Product product={products[1]} />
        <Product product={products[2]} />
        <Product product={products[3]} />
        <Product product={products[4]} />
      </section>
    );
  };

  Products.propTypes = {
    products: PropTypes.arrayOf( // PropTypes.arrayOf() will allow us to pass object
      PropTypes.shape({ //   PropTypes.shape() will allow us to pass object
       id: PropTypes.number.isRequired,
        title: PropTypes.string,
        price: PropTypes.number,
        description: PropTypes.string,
        category: PropTypes.string,
         <!-- value: PropTypes.oneOfType([PropTypes.string, PropTypes.number]),
          onChange: PropTypes.func,
          required: PropTypes.bool, -->
        image: PropTypes.string,
        rating: PropTypes.shape({
          rate: PropTypes.number,
          count: PropTypes.number,
        }),
      })
    ),
  };

  export default Products;

// Product.jsx
import React from 'react';

import PropTypes from 'prop-types';

const Product = (props) => {
  const { product } = props;
  return (
    <article className="product card">
      <img className="product__img" src={product.image} alt={product.title} />
      <p className="product__title">{product.title}</p>
      <p className="product__description">
        {product.description.substring(0, 40)}
        ...
      </p>
      <p className="product__price">Price: {product.price}</p>
      <p>Category: {product.category}</p>
      <p>Rating: {product.rating.rate}/5</p>
    </article>
  );
};

Product.propTypes = {
  product: PropTypes.shape({
   id: PropTypes.number.isRequired,
```

```
    title: PropTypes.string,
    price: PropTypes.number,
    description: PropTypes.string,
    category: PropTypes.string,
    image: PropTypes.string,
    rating: PropTypes.shape({
      rate: PropTypes.number,
      count: PropTypes.number,
    }),
  }),
};

export default Product;
```

1.7 Mapping & rednering components

- learn how to use map() and filter() from an array of Data.
- **Code Example - 14 (Map component with for loop)**

```
const Products = (props) => {
  const { products } = props;

  const productsElement = [];

  for (let index = 0; index < products.length; index++) {
    productsElement.push(<Product product={products[index]} />);
  }

  return <section className="products">{productsElement}</section>;
};
```

- **Code Example - 15 (Map component with forEach higher order Array function)**

```
const Products = (props) => {
  const { products } = props;
  const productsElement = [];
  products.forEach((product) => {
    return productsElement.push(<Product product={product} />);
  });
  return <section className="products">{productsElement}</section>;
};
```

- **Code Example - 16 (Map component with map higher order Array function)**

```
const Products = (props) => {
  const { products } = props;
  const productsElement = products.map((product) => {
    return <Product product={product} />;
  });
  return <section className="products">{productsElement}</section>;
};
```

Adding unique key to each child

we need to map each children of list uniquely so that react can identify them wor properly.Keys are unique. we can use same keys for JSX nodes in different arrays.

- Where I can find key?
  - from database
  - generate locally - crypto.randomUUID() , uuid, nanoid
    - we can use index or any external package like uuid
    - How to use uuid:

```
step 1: npm install uuid
step 2: import { v4 as uuidv4 } from "uuid";
step 3: uuidv4(); // ⇨ '9b1deb4d-3b7d-4bad-9bdd-2b0d7b3dcb6d'
```

- **Code Example - 17 (Adding unique key)**

```
// first use index
// second use the available id
// third use the uuid if id is not available inside the data
import React from 'react';
import PropTypes from 'prop-types';
import { nanoid } from 'nanoid';

import Product from './Product';

const Products = (props) => {
  const { products } = props;
```

```
  const productsElement = products.map((product) => {
    return <Product product={product} key={nanoid()} />;
  });
  return <section className="products">{productsElement}</section>;
};

// get a uniqueId -> utility/getUniqueId.js
import { v4 as uuidv4 } from 'uuid';
export const getUniqueId = () => uuidv4();
```

[jsx spread syntax]

- Code Example - 18 (jsx spread syntax)

```
const Products = (props) => {
  const { products } = props;

  const productsElement = products.map((product) => {
    return <Product {...product} key={nanoid()} />;
  });
  return <section className="products">{productsElement}</section>;
};

const Product = ({ ...product }) => {
  return (
    <article className="product card">
      <img className="product__img" src={product.image} alt={product.title} />
      <p className="product__title">{product.title}</p>
      <p className="product__description">
        {product.description.substring(0, 40)}
        ...
      </p>
      <p className="product__price">Price: {product.price}</p>
      <p>Category: {product.category}</p>
      <p>Rating: {product.rating.rate}/5</p>
    </article>
  );
};
```

- Code Example - 19 (passing jsx as children)

```
// Card.jsx
import React from 'react';
const Card = (props) => {
  return <div className="card">{props.children}</div>;
};
export default Card;


// Product.jsx
import React from 'react';
import PropTypes from 'prop-types';
import Card from './Card';
const Product = (props) => {
  const { product } = props;
  return (
    <Card>
      <article className="product">
        <img className="product__img" src={product.image} alt={product.title} />
        <p className="product__title">{product.title}</p>
        <p className="product__description">
          {product.description.substring(0, 40)}
          ...
        </p>
        <p className="product__price">Price: {product.price}</p>
        <p>Category: {product.category}</p>
        <p>Rating: {product.rating.rate}/5</p>
      </article>
    </Card>
  );
};

Product.propTypes = {
  product: PropTypes.shape({
    id: PropTypes.number.isRequired,
    title: PropTypes.string,
    price: PropTypes.number,
    description: PropTypes.string,
    category: PropTypes.string,
    image: PropTypes.string,
    rating: PropTypes.shape({
      rate: PropTypes.number,
      count: PropTypes.number,
    }),
  }),
};

export default Product;
```

1.8 Conditional rendering

- rendering components based on if-else, element variable, ternary, short circuit
- **Code Example - 20 (Conditional rendering: element variable)**

```
const Products = (props) => {
  const { products } = props;

  let productsElement;
  if (products && products.length > 0) {
    productsElement = products.map((product) => {
      return <Product product={product} key={nanoid()} />;
    });
  } else {
    return <p>No products available</p>;
  }
  return <section className="products">{productsElement}</section>;
};
```

- **Code Example - 21 (Conditional rendering: ternary)**

```
const Products = (props) => {
  const { products } = props;

  let productsElement =
    products && products.length > 0 ? (
      products.map((product) => {
        return <Product product={product} key={nanoid()} />;
      })
    ) : (
      <p>No products available</p>
    );

  return <section className="products">{productsElement}</section>;
};

// An alternative - we can use ternary inside return () function
const Products = (props) => {
  const { products } = props;

  return (
    <section className="products">
      {products && products.length > 0 ? (
        products.map((product) => {
          return <Product product={product} key={nanoid()} />;
        })
      ) : (
        <p>No products available</p>
      )}
    </section>
  );
};
```

- **Code Example - 22 (Conditional rendering: short circuit)**

```
const Products = (props) => {
  const { products } = props;

  return (
    <section className="products">
      {products.length > 0 &&
        products.map((product) => (
          <Product product={product} key={product.id} />
        ))}
      {products.length === 0 && <p>No products available</p>}
    </section>
  );
};
```

Assignment 1: products-listing-app

1.9 developer tools, react and font-awesome icons

- developer tools and extension
- Add font awesome / react icons
- How to use react-icons
- install `npm install react-icons --save`
- **Code Example - 23 (Adding & styling react icons)**

```
import React from 'react';

import { FaFacebookF, FaYoutube, FaTwitter } from 'react-icons/fa';

const Footer = () => {
  return (
```

```
    <footer className="footer">
      <div className="footer__left">
        <p>Copyright by @Anisul Islam</p>
      </div>
      <div className="footer__right">
        <FaFacebookF />
        <FaYoutube />
        <FaTwitter />
      </div>
    </footer>
  );
};

export default Footer;
```

- How to use font awesome icons directly

```
 // Add SVG Core
npm i --save @fortawesome/fontawesome-svg-core

// add Free icons styles
npm i --save @fortawesome/free-solid-svg-icons
npm i --save @fortawesome/free-regular-svg-icons
npm i --save @fortawesome/free-brands-svg-icons

// add the react component
npm i --save @fortawesome/react-fontawesome@latest


// usage
import { FontAwesomeIcon } from '@fortawesome/react-fontawesome';
import { faPlusCircle, faMinusCircle } from '@fortawesome/free-solid-svg-icons';
import { faYoutube } from '@fortawesome/free-brands-svg-icons';

<FontAwesomeIcon icon={faPlusCircle}></FontAwesomeIcon>

// use className for styling icons
```

[1.10 Adding Interactivity - event & event handler]

- Event: any user interaction like clicking button, hovering button, giving values in input field etc.
- Event handler: your response to user interactions. create a function for handling the interaction.
- state - value of anything can be changed based on your interaction and you may want to update UI based on state.
- add 2 buttons: show details, addToCart.

```
/*reset code and common ends here*/
:root {
  --primary-color: #0bb530; /* Updated to a more vibrant green */
  --secondary-color: rgba(36, 122, 55, 0.9);
  --background-color: #f5f5f5; /* Light background color */
  --text-color: #333; /* Darker text color for better readability */
  --padding: 0.5rem;
  --transition: all 0.3s;
  --border-radius: 0.6rem;
  --box-shadow: 0.1rem 0.2rem 0.8rem rgba(0, 0, 0, 0.1); /* Softer shadow */
}

* {
  box-sizing: border-box;
  margin: 0;
  padding: 0;
  text-decoration: none;
  list-style-type: none;
  outline: none;
}

html {
  scroll-behavior: smooth;
}

body {
  font-family: 'Arial', sans-serif;
  background-color: var(--background-color);
  color: var(--text-color);
}

.flex-space-around {
  display: flex;
  justify-content: space-around;
  align-items: center;
}

.flex-center {
  display: flex;
  justify-content: center;
  align-items: center;
}
```

```css
img {
  width: 100%;
  height: auto;
  object-fit: contain;
}

.card {
  background-color: white;
  padding: var(--padding);
  border-radius: var(--border-radius);
  box-shadow: var(--box-shadow);
  transition: var(--transition);
}

.card:hover {
  transform: translateY(-5px);
  box-shadow: 0.2rem 0.4rem 1rem rgba(0, 0, 0, 0.2);
}

.button {
  background-color: var(--primary-color);
  color: white;
  padding: 0.5rem 1rem;
  border: none;
  border-radius: var(--border-radius);
  cursor: pointer;
  transition: var(--transition);
}

.button:hover {
  background-color: var(--secondary-color);
}

/*reset code and common ends here*/

/*header starts here*/
.header {
  height: 10vh;
  background-color: var(--primary-color);
  color: white;
  display: flex;
  align-items: center;
  justify-content: space-between;
  padding: 0 2rem;
}
/*header ends here*/

/*main starts here*/
main {
  min-height: 80vh;
  padding: 2rem;
}

.container {
  display: flex;
  gap: 2rem;
}

.sidebar {
  flex: 1;
  padding: var(--padding);
  display: flex;
  flex-direction: column;
  gap: 1rem;
  background-color: white;
  border: 1px solid var(--primary-color);
  border-radius: var(--border-radius);
  box-shadow: var(--box-shadow);
}

.main-content {
  flex: 3;
  padding: var(--padding);
}

.products {
  display: grid;
  grid-template-columns: repeat(3, minmax(0, 1fr));
  gap: 2rem;
}

.product {
  height: 100%;
  display: flex;
  justify-content: space-evenly;
  flex-direction: column;
  gap: 0.1rem;
}
.product__img {
  width: 100%;
  height: 10rem;
  object-fit: cover;
  border-radius: var(--border-radius);
}
```

```css
.product__title {
  font-size: 1.2rem;
  font-weight: bold;
  margin: 0.5rem 0;
}

.product__description {
  font-size: 0.9rem;
  color: var(--secondary-color);
  margin: 0.5rem 0;
}

.product__price {
  font-size: 1rem;
  color: var(--primary-color);
  font-weight: bold;
  margin: 0.5rem 0;
}

.product__btns {
  gap: 0.1rem;
}

/*main ends here*/

/*footer starts here*/
.footer {
  height: 10vh;
  padding: var(--padding);
  background-color: var(--primary-color);
  color: white;
  font-size: 1.1rem;
  display: flex;
  justify-content: space-between;
  align-items: center;
  padding: 0 2rem;
}

.footer a {
  color: white;
  font-weight: bold;
}

.footer .social-media a {
  margin: 0 0.5rem;
  font-size: 1.2rem;
}
/*footer ends here*/

/*responsiveness starts here*/
@media (max-width: 992px) {
  .flex-space-around,
  .flex-center {
    flex-direction: column;
    gap: 1rem;
  }
  .header {
    flex-direction: column;
    padding: 1rem 0;
  }
  .sidebar {
    width: 100%;
  }
  .products {
    grid-template-columns: repeat(2, minmax(0, 1fr));
  }
}

@media (max-width: 768px) {
  .products {
    grid-template-columns: repeat(1, minmax(0, 1fr));
  }
}
/*responsiveness ends here*/
```

- **Code Example - 24 (event & Handler)**

```jsx
// method 1
import React from 'react';
import PropTypes from 'prop-types';

import Card from './Card';

const Product = (props) => {
  const { product } = props;

  const handleShowDetails = () => {
    alert('product details is here');
  };
  const handleAddToCart = () => {
    alert('product is added to cart');
  };
```

```
  return (
    <Card>
      <article className="product">
        <img
          className="product__img"
          src={product.image}
          alt={product.title}
        />
        <p className="product__title">{product.title}</p>
        <p className="product__description">
          {product.description.substring(0, 40)}
          ...
        </p>
        <p className="product__price">Price: {product.price}</p>
        <p>Category: {product.category}</p>
        <p>Rating: {product.rating.rate}/5</p>
        <div className="product__btns flex-space-around">
          <button
            className="button"
            onClick={() => {
              alert('product details is here');
            }}
          >
            Show Details
          </button>
          <button className="button" onClick={handleAddToCart}>
            Add To Cart
          </button>
        </div>
      </article>
    </Card>
  );
};

Product.propTypes = {
  product: PropTypes.shape({
    id: PropTypes.number.isRequired,
    title: PropTypes.string,
    price: PropTypes.number,
    description: PropTypes.string,
    category: PropTypes.string,
    image: PropTypes.string,
    rating: PropTypes.shape({
      rate: PropTypes.number,
      count: PropTypes.number,
    }),
  }),
};

export default Product;

// method 2
```

- Code Example - 25 (Pass parameter with event)

```
import React from 'react';

import PropTypes from 'prop-types';

import Card from './Card';

const Product = (props) => {
  const { product } = props;

  // const handleShowDetails = () => {
  //   alert('product details is here');
  // };
  // const handleAddToCart = () => {
  //   alert('product is added to cart');
  // };
  return (
    <Card>
      <article className="product">
        <img className="product__img" src={product.image} alt={product.title} />
        <p className="product__title">{product.title}</p>
        <p className="product__description">
          {product.description.substring(0, 40)}
          ...
        </p>
        <p className="product__price">Price: {product.price}</p>
        <p>Category: {product.category}</p>
        <p>Rating: {product.rating.rate}/5</p>
        <div className="product__btns flex-space-around">
          <button
            className="button"
            onClick={() => {
              alert(JSON.stringify(product));
            }}
          >
            Show Details
          </button>
          <button
```

```
            className="button"
            onClick={() => {
              alert(JSON.stringify(product));
            }}
          >
            Add To Cart
          </button>
        </div>
      </article>
    </Card>
  );
};

Product.propTypes = {
  product: PropTypes.shape({
    id: PropTypes.number.isRequired,
    title: PropTypes.string,
    price: PropTypes.number,
    description: PropTypes.string,
    category: PropTypes.string,
    image: PropTypes.string,
    rating: PropTypes.shape({
      rate: PropTypes.number,
      count: PropTypes.number,
    }),
  }),
};

export default Product;

// method 2
import React from 'react';
import PropTypes from 'prop-types';

import Card from './Card';

const Product = (props) => {
  const { product } = props;

  const handleShowDetails = (product) => {
    alert(JSON.stringify(product));
  };
  const handleAddToCart = (product) => {
    alert(JSON.stringify(product));
  };

  return (
    <Card>
      <article className="product">
        <img className="product__img" src={product.image} alt={product.title} />
        <p className="product__title">{product.title}</p>
        <p className="product__description">
          {product.description.substring(0, 40)}
          ...
        </p>
        <p className="product__price">Price: {product.price}</p>
        <p>Category: {product.category}</p>
        <p>Rating: {product.rating.rate}/5</p>
        <div className="product__btns flex-space-around">
          <button className="button" onClick={() => handleShowDetails(product)}>
            Show Details
          </button>
          <button className="button" onClick={() => handleAddToCart(product)}>
            Add To Cart
          </button>
        </div>
      </article>
    </Card>
  );
};

Product.propTypes = {
  product: PropTypes.shape({
    id: PropTypes.number.isRequired,
    title: PropTypes.string,
    price: PropTypes.number,
    description: PropTypes.string,
    category: PropTypes.string,
    image: PropTypes.string,
    rating: PropTypes.shape({
      rate: PropTypes.number,
      count: PropTypes.number,
    }),
  }),
};

export default Product;
```

- Code Example - 26 (Create a form for adding new product)

```
import React from 'react';

import Card from './Card';
```

```jsx
const NewProduct = () => {
  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form">
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input type="text" id="title" name="title" required />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input type="number" id="price" name="price" required />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea id="description" name="description" required />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select id="category" name="category" required>
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea id="image" name="image" required />
          </div>

          <button className="button" type="submit">
            Add Product
          </button>
        </form>
      </div>
    </Card>
  );
};

export default NewProduct;
```

```css
/* add product form starts here */

.new-product h2 {
  text-align: center;
}
.product-form {
  padding: 20px;
}

.form__control {
  margin-bottom: 10px;
}
.product-form label {
  display: block;
  margin-bottom: 5px;
}

.product-form input,
.product-form select,
.product-form textarea {
  width: 100%;
  padding: 8px;
  box-sizing: border-box;
}

.product-form button {
  width: 100%;
  padding: 10px;
  background-color: #4caf50;
  color: white;
  border: none;
  border-radius: 5px;
  cursor: pointer;
}

.product-form button:hover {
  background-color: #45a049;
}

/*add product form ends here*/
```

- **Assignment - 27 (Create a form for user registration)**

- Assignment - 28 (Create a form for user login)
- Code Example - 29 (onChange Event)

```
import React from 'react';

import Card from './Card';

const NewProduct = () => {
  const handleTitleChange = (event) => {
    console.log(event.target.value);
  };
  const handlePriceChange = (event) => {
    console.log(event.target.value);
  };
  const handleDescriptionChange = (event) => {
    console.log(event.target.value);
  };
  const handleImageChange = (event) => {
    console.log(event.target.value);
  };
  const handleCategoryChange = (event) => {
    console.log(event.target.value);
  };
  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form">
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              onChange={handleTitleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              onChange={handlePriceChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              onChange={handleDescriptionChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              onChange={handleCategoryChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleImageChange}
              required
            />
          </div>

          <button className="button" type="submit">
            Add Product
          </button>
        </form>
      </div>
    </Card>
```

```
    );
  };

  export default NewProduct;
```

- **Code Example - 30 (onSubmit Event)**

```
import React from 'react';
import Card from './Card';

const NewProduct = () => {
  const handleTitleChange = (event) => {
    console.log(event.target.value);
  };
  const handlePriceChange = (event) => {
    console.log(event.target.value);
  };
  const handleDescriptionChange = (event) => {
    console.log(event.target.value);
  };
  const handleImageChange = (event) => {
    console.log(event.target.value);
  };
  const handleCategoryChange = (event) => {
    console.log(event.target.value);
  };
  const handleSubmit = (event) => {
    event.preventDefault();
    console.log('new product is created');
  };

  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              onChange={handleTitleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              onChange={handlePriceChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              onChange={handleDescriptionChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              onChange={handleCategoryChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleImageChange}
              required
            />
```

```
          </div>

          <button className="button" type="submit">
            Create Product
          </button>
        </form>
      </div>
    </Card>
  );
};

export default NewProduct;
```

1.11 useState Hooks

- **Code Example - 31 (Example 1: without state management NewProduct Example: do not re-render when value updates)**

```
import React from 'react';
import Card from './Card';

const NewProduct = () => {
  let title = '';
  const handleTitleChange = (event) => {
    title = event.target.value;
    console.log(title);
  };
  const handlePriceChange = (event) => {
    console.log(event.target.value);
  };
  const handleDescriptionChange = (event) => {
    console.log(event.target.value);
  };
  const handleImageChange = (event) => {
    console.log(event.target.value);
  };
  const handleCategoryChange = (event) => {
    console.log(event.target.value);
  };
  const handleSubmit = (event) => {
    event.preventDefault();
    console.log('new product is created');
  };

  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              onChange={handleTitleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              onChange={handlePriceChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              onChange={handleDescriptionChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              onChange={handleCategoryChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
```

```
            <option value="books">Books</option>
            <option value="furniture">Furniture</option>
          </select>
        </div>

        <div className="form__control">
          <label htmlFor="image">Image URL: </label>
          <textarea
            id="image"
            name="image"
            onChange={handleImageChange}
            required
          />
        </div>

        <button className="button" type="submit">
          Add Product
        </button>

        <p>{title}</p>
      </form>
    </div>
  </Card>
 );
};

export default NewProduct;
```

state and useState() hook

- state is a memory for component where we can update value and re-render the component
- state is a global variable thats why when you even re-render it fetch the last updated value
- hooks are function which we can implement in our component - useState, useEffect
- useState() hook helps us to track state in a functional component.
- **Code Example - 32 (Example 1: with state management Products Example: re-render when value updates)**

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

import Card from './Card';

const NewProduct = () => {
  const [title, setTitle] = useState('');
  const [price, setPrice] = useState('');
  const [description, setDescription] = useState('');
  const [category, setCategory] = useState('');
  const [image, setImage] = useState('');

  const handleTitleChange = (event) => {
    setTitle(event.target.value);
  };
  const handlePriceChange = (event) => {
    setPrice(event.target.value);
  };
  const handleDescriptionChange = (event) => {
    setDescription(event.target.value);
  };
  const handleImageChange = (event) => {
    setImage(event.target.value);
  };
  const handleCategoryChange = (event) => {
    setCategory(event.target.value);
  };
  const handleSubmit = (event) => {
    event.preventDefault();
    console.log('new product is created');
  };

  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              onChange={handleTitleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
```

```
              onChange={handlePriceChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              onChange={handleDescriptionChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              onChange={handleCategoryChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleImageChange}
              required
            />
          </div>

          <button className="button" type="submit">
            Create Product
          </button>

          <div>
            <p>{title}</p>
            <p>{price}</p>
            <p>{description}</p>
            <p>{category}</p>
            <p>{image}</p>
          </div>
        </form>
      </div>
    </Card>
  );
};

export default NewProduct;

// create the new pRODUCT
import React, { useState } from 'react';

import Card from './Card';

const NewProduct = () => {
  const [title, setTitle] = useState('');
  const [price, setPrice] = useState('');
  const [description, setDescription] = useState('');
  const [category, setCategory] = useState('');
  const [image, setImage] = useState('');

  const handleTitleChange = (event) => {
    setTitle(event.target.value);
  };
  const handlePriceChange = (event) => {
    setPrice(event.target.value);
  };
  const handleDescriptionChange = (event) => {
    setDescription(event.target.value);
  };
  const handleImageChange = (event) => {
    setImage(event.target.value);
  };
  const handleCategoryChange = (event) => {
    setCategory(event.target.value);
  };
  const handleSubmit = (event) => {
    event.preventDefault();
    const newProduct = {
      id: new Date().getTime().toString(),
      title: title,
      price: price,
```

```
      description: description,
      category: category,
      image: image,
    };
    console.log(newProduct);
  };

  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              onChange={handleTitleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              onChange={handlePriceChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              onChange={handleDescriptionChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              onChange={handleCategoryChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleImageChange}
              required
            />
          </div>

          <button className="button" type="submit">
            Create Product
          </button>
        </form>
      </div>
    </Card>
  );
};

export default NewProduct;
```

- Code Example - 33 (Example 2: without state management Counter Example: do not re-render when value updates)

```
const Counter = () => {
  let count = 0;

  const handleIncrement = () => {
    count++;
    alert(count);
  };
  const handleDecrement = () => {
    count--;
```

```
    alert(count);
  };
  const handleReset = () => {
    count = 0;
    alert(count);
  };

  return (
    <div>
      <h2>Count: {count}</h2>
      <button onClick={handleIncrement}>+</button>
      <button onClick={handleReset}>0</button>
      <button onClick={handleDecrement}>-</button>
    </div>
  );
};

export default Counter;
```

- **Code Example - 34 (Counter App)**

```
// App.js
import React from 'react';

import Counter from './components/Counter';

const App = () => {
  return (
    <div>
      <Counter />
    </div>
  );
};

export default App;
```

```
// Counter.js
import React, { useState } from 'react';

function Counter() {
  const [count, setCount] = useState(0);
  const handleIncrement = () => {
    setCount(count + 1); // setCount (count => count + 1)
  };

  return (
    <div>
      <h2>Counter: {count}</h2>
      <button onClick={handleIncrement}>+</button>
    </div>
  );
}

export default Counter;
```

- **Code Example - 35 (why update data based on prevState?)**
- update state based on prev value - `setCount (count => count + 1)`

```
    const handleIncrement = (e) => {
      e.stopPropagation();

      setcount(count + 1);
      setcount(count + 1);
      setcount(count + 1);

      console.log("increment count: ", count);
    };

    const handleIncrement = (e) => {
        e.stopPropagation();

        setcount((count) => count + 1);
        setcount((count) => count + 1);
        setcount((count) => count + 1);

        console.log("increment count: ", count);
      };

    const handleIncrement = (e) => {
       e.stopPropagation();
      setTimeout(() => {
        <!-- setcount(count + 1); -->
        setcount((count) => count + 1);
      }, 3000);
      console.log("increment count: ", count);
    };
```

Counter App Code

upating object in state

- Code Example - 36 (updating object in state)

```
// example with problem when updating states
import React, { useState } from 'react';

import Card from './Card';

const NewProduct = () => {
  const [product, setProduct] = useState({
    title: '',
    description: '',
    price: '',
    category: '',
    image: '',
  });

  const handleTitleChange = (event) => {
    setProduct({
      title: event.target.value,
      description: '',
      price: '',
      category: '',
      image: '',
    });
  };
  const handlePriceChange = (event) => {
    setProduct({
      title: '',
      description: '',
      price: event.target.value,
      category: '',
      image: '',
    });
  };
  const handleDescriptionChange = (event) => {
    setProduct({
      title: '',
      description: event.target.value,
      price: '',
      category: '',
      image: '',
    });
  };
  const handleImageChange = (event) => {
    setProduct({
      title: '',
      description: '',
      price: '',
      category: '',
      image: event.target.value,
    });
  };
  const handleCategoryChange = (event) => {
    setProduct({
      title: '',
      description: '',
      price: '',
      category: event.target.value,
      image: '',
    });
  };
  const handleSubmit = (event) => {
    event.preventDefault();
    const newProduct = {
      id: new Date().getTime().toString(),
      ...product,
    };
    console.log(newProduct);
  };
};

export default NewProduct;

// solution
const NewProduct = () => {
  const [product, setProduct] = useState({
    title: '',
    description: '',
    price: '',
    category: '',
    image: '',
  });

  const handleTitleChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };
  const handlePriceChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
```

```
      [event.target.name]: event.target.value,
    }));
  };
  const handleDescriptionChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };
  const handleImageChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };
  const handleCategoryChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };
  const handleSubmit = (event) => {
    event.preventDefault();
    const newProduct = {
      id: new Date().getTime().toString(),
      ...product,
    };
    console.log(newProduct);
  };
};
```

- we can also use name attribute for identifying element and use 1 function instead of many. from event handler we can use event.target.name and then decide what to do or not? - [1 handler for multiple elements] (https://github.com/anisul-Islam/react-counter-app-1-function/blob/master/src/components/Counter.js)
- **Code Example - 37 (1 event handler for multiple elements)**

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

import Card from './Card';

const NewProduct = () => {
  const [product, setProduct] = useState({
    title: '',
    description: '',
    price: '',
    category: '',
    image: '',
  });

  const handleChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };

  const handleSubmit = (event) => {
    event.preventDefault();
    const newProduct = {
      id: new Date().getTime().toString(),
      ...product,
    };
    console.log(newProduct);
  };

  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              onChange={handleChange}
              required
            />
          </div>
```

```
          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              onChange={handleChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleChange}
              required
            />
          </div>

          <button className="button" type="submit">
            Create Product
          </button>
        </form>
      </div>
    </Card>
  );
};

export default NewProduct;
```

Upating array in state

Assignment - 2: Counter App

1.12 Controlled components and Form

- Code Example - 39 (reset the form and control component)

```
// input fields => update states
// update states => input fields

import React, { useState } from 'react';

import Card from './Card';

const NewProduct = () => {
  const initialState = {
    title: '',
    description: '',
    price: '',
    category: '',
    image: '',
  };
  const [product, setProduct] = useState(initalState);

  const handleChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };

  const handleSubmit = (event) => {
    event.preventDefault();
    const newProduct = {
      id: new Date().getTime().toString(),
      ...product,
    };
    setProduct(initalState);
  };

  return (
    <Card>
```

```
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              value={product.title}
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              value={product.price}
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              value={product.description}
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              value={product.category}
              onChange={handleChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleChange}
              value={product.image}
              required
            />
          </div>

          <button className="button" type="submit">
            Create Product
          </button>
        </form>
      </div>
    </Card>
  );
};

export default NewProduct;
```

Form: User SignUp and SignIn Form

Spinner for loading

1. Without a library

```
import React from 'react';

const LoadingSpinner = () => {
  return <div className="spinner"></div>;
};

export default LoadingSpinner;
```

```
// index.css
.spinner {
  border: 4px solid rgba(0, 0, 0, 0.1);
  width: 40px;
  height: 40px;
  border-radius: 50%;
  border-left-color: #09f;
  animation: spin 1s linear infinite;
}
@keyframes spin {
  to {
    transform: rotate(360deg);
  }
}
```

2. React Spinners by `react-spinners`

The React Spinners library provides several types of loaders, including ClipLoader, BeatLoader, and more. It's lightweight and easy to integrate.

Installation

```
npm install react-spinners
```

Usage

Import the loader component you want to use, and conditionally render it based on the `isLoading` state.

```
// SignUpForm.js
import React, { useState } from 'react';
import ClipLoader from 'react-spinners/ClipLoader';
import { nanoid } from 'nanoid';
import { uploadImageToCloduinary } from '../../utility/uploadImageToCloudinary';
import FormButton from '../form/FormButton';
import FormGroup from '../form/FormGroup';
import ImagePreview from '../form/ImagePreview';
import FormSelectGroup from '../form/FormSelectGroup';

const SignUpForm = () => {
  const [isLoading, setIsLoading] = useState(false); // loading state

  const handleChange = async (event) => {
    const { name, value, type, files } = event.target;
    if (type === 'file' && files[0]) {
      setIsLoading(true); // start loading
      try {
        const imageUrl = await uploadImageToCloduinary(files[0]);
        setUser((prevState) => ({
          ...prevState,
          [name]: imageUrl,
        }));
      } catch (error) {
        console.error(error);
      } finally {
        setIsLoading(false); // stop loading
      }
    } else {
      setUser((prevState) => ({
        ...prevState,
        [name]: value,
      }));
    }
  };

  return (
    <div>
      {isLoading && <ClipLoader size={40} color="#09f" />}{' '}
      {/* Show spinner if loading */}
      <form onSubmit={handleSubmit} className="form">
        <h2>Sign Up</h2>
        <FormGroup
          id="name"
          label="Name"
          type="text"
          name="name"
          value={user.name}
          onChange={handleChange}
          required={true}
          error={errors.name}
        />
        {/* ...other form fields... */}
        <FormButton type="submit"> Sign Up </FormButton>
      </form>
    </div>
  );
};

export default SignUpForm;
```

3. React Loading by `@agney/react-loading`

React Loading provides multiple loading animations and is also highly customizable.

Installation2

```
npm install @agney/react-loading
```

Usage2

```
import ReactLoading from '@agney/react-loading';

{
  isLoading && <ReactLoading type="bars" color="#09f" height={40} width={40} />;
}
```

Both libraries offer easy-to-use, customizable loading spinners without the need for manual styling. This approach keeps your UI more consistent and streamlined.

[1.13 Form Validation]

Add validation to form without any library

```
//@ts-nocheck
//@ts-nocheck
import React, { useState } from 'react';

// Styles (for inline styling)
const styles = {
  form: {
    width: '300px',
    margin: '0 auto',
    padding: '20px',
    border: '1px solid #ccc',
    borderRadius: '5px',
  },
  formGroup: {
    marginBottom: '15px',
  },
  input: {
    width: '100%',
    padding: '8px',
    boxSizing: 'border-box',
  },
  textarea: {
    width: '100%',
    padding: '8px',
    height: '80px',
    boxSizing: 'border-box',
  },
  button: {
    width: '100%',
    padding: '10px',
    backgroundColor: '#007bff',
    color: '#fff',
    border: 'none',
    borderRadius: '5px',
    cursor: 'pointer',
  },
  error: {
    color: 'red',
    fontSize: '12px',
    marginTop: '5px',
  },
};

const AddProductForm = () => {
  // State to manage form data
  const [formData, setFormData] = useState({
    productName: '',
    description: '',
    price: '',
    quantity: '',
    category: '',
    image: '',
    isOnSale: false,
    condition: '',
  });

  // State to manage validation errors
  const [errors, setErrors] = useState({});

  // Handle input changes
  const handleChange = (e) => {
    const { id, value, type, checked, name } = e.target;
    setFormData((prevFormData) => ({
      ...prevFormData,
      [name || id]: type === 'checkbox' ? checked : value,
    }));
  };
```

```
// Handle image input separately
const handleImageChange = (e) => {
  const file = e.target.files[0];
  setFormData((prevFormData) => ({
    ...prevFormData,
    image: file,
  }));
};

// Validation logic
const validateForm = () => {
  const newErrors = {};
  if (!formData.productName.trim())
    newErrors.productName = 'Product name is required';
  if (formData.description.length < 10)
    newErrors.description =
      'Description should be at least 10 characters long';
  if (!formData.price || parseFloat(formData.price) <= 0)
    newErrors.price = 'Price must be a positive number';
  if (!formData.quantity || parseInt(formData.quantity, 10) <= 0)
    newErrors.quantity = 'Quantity must be a positive integer';
  if (!formData.category) newErrors.category = 'Please select a category';
  if (!formData.condition)
    newErrors.condition = 'Please select the product condition';
  if (!formData.image) newErrors.image = 'Please upload a product image';

  setErrors(newErrors);
  return Object.keys(newErrors).length === 0; // Return true if no errors
};

// Handle form submission
const handleSubmit = (e) => {
  e.preventDefault();
  if (validateForm()) {
    const newProduct = {
      productName: formData.productName,
      description: formData.description,
      price: parseFloat(formData.price),
      quantity: parseInt(formData.quantity, 10),
      category: formData.category,
      image: formData.image,
      isOnSale: formData.isOnSale,
      condition: formData.condition,
    };

    console.log('Product Submitted: ', newProduct);

    // Reset form after submission
    setFormData({
      productName: '',
      description: '',
      price: '',
      quantity: '',
      category: '',
      image: '',
      isOnSale: false,
      condition: '',
    });
    setErrors({});
    e.target.reset(); // Reset file input manually
  } else {
    console.log('Form contains errors. Please fix them.');
  }
};

return (
  <form onSubmit={handleSubmit} style={styles.form}>
    <h2>Add a New Product</h2>

    {/* Product Name */}
    <div style={styles.formGroup}>
      <label htmlFor="productName">Product Name:</label>
      <input
        type="text"
        id="productName"
        name="productName" // Added name
        value={formData.productName}
        onChange={handleChange}
        required
        style={styles.input}
      />
      {errors.productName && <p style={styles.error}>{errors.productName}</p>}
    </div>

    {/* Description */}
    <div style={styles.formGroup}>
      <label htmlFor="description">Description:</label>
      <textarea
        id="description"
        name="description" // Added name
        value={formData.description}
        onChange={handleChange}
        required
        style={styles.textarea}
```

```
        />
        {errors.description && <p style={styles.error}>{errors.description}</p>}
      </div>

      {/* Price */}
      <div style={styles.formGroup}>
        <label htmlFor="price">Price:</label>
        <input
          type="number"
          id="price"
          name="price" // Added name
          value={formData.price}
          onChange={handleChange}
          required
          style={styles.input}
          step="0.01"
          min="0"
        />
        {errors.price && <p style={styles.error}>{errors.price}</p>}
      </div>

      {/* Quantity */}
      <div style={styles.formGroup}>
        <label htmlFor="quantity">Quantity:</label>
        <input
          type="number"
          id="quantity"
          name="quantity" // Added name
          value={formData.quantity}
          onChange={handleChange}
          required
          style={styles.input}
          min="1"
        />
        {errors.quantity && <p style={styles.error}>{errors.quantity}</p>}
      </div>

      {/* Category */}
      <div style={styles.formGroup}>
        <label htmlFor="category">Category:</label>
        <select
          id="category"
          name="category" // Added name
          value={formData.category}
          onChange={handleChange}
          required
          style={styles.input}
        >
          <option value="">Select a category</option>
          <option value="electronics">Electronics</option>
          <option value="clothing">Clothing</option>
          <option value="furniture">Furniture</option>
          <option value="books">Books</option>
          <option value="accessories">Accessories</option>
          <option value="sports">Sports</option>
        </select>
        {errors.category && <p style={styles.error}>{errors.category}</p>}
      </div>

      {/* Image Upload */}
      <div style={styles.formGroup}>
        <label htmlFor="image">Product Image:</label>
        <input
          type="file"
          id="image"
          name="image" // Added name
          onChange={handleImageChange}
          required
          style={styles.input}
          accept="image/*"
        />
        {formData.image && (
          <div>
            <img
              className="user-img"
              src={URL.createObjectURL(formData.image)}
              alt="Selected Preview"
              style={{ maxWidth: '100%', height: 'auto', marginTop: '10px' }}
            />
          </div>
        )}
        {errors.image && <p style={styles.error}>{errors.image}</p>}
      </div>

      {/* Checkbox: On Sale */}
      <div style={styles.formGroup}>
        <label htmlFor="isOnSale">
          <input
            type="checkbox"
            id="isOnSale"
            name="isOnSale" // Added name
            checked={formData.isOnSale}
            onChange={handleChange}
          />{' '}
```

```
          On Sale
        </label>
      </div>

      {/* Radio Buttons: Product Condition */}
      <div style={styles.formGroup}>
        <label>Condition:</label>
        <div>
          <label>
            <input
              type="radio"
              name="condition" // Use name for grouping
              value="new"
              checked={formData.condition === 'new'}
              onChange={handleChange}
            />{' '}
            New
          </label>
          <label>
            <input
              type="radio"
              name="condition" // Use name for grouping
              value="used"
              checked={formData.condition === 'used'}
              onChange={handleChange}
            />{' '}
            Used
          </label>
          <label>
            <input
              type="radio"
              name="condition" // Use name for grouping
              value="refurbished"
              checked={formData.condition === 'refurbished'}
              onChange={handleChange}
            />{' '}
            Refurbished
          </label>
        </div>
        {errors.condition && <p style={styles.error}>{errors.condition}</p>}
      </div>

      {/* Submit Button */}
      <button type="submit" style={styles.button}>
        Add Product
      </button>
    </form>
  );
};

export default AddProductForm;

NewProduct.propTypes = {
  onHandleAddNewProduct: PropTypes.func,
};
```

React-hook-form validation

-my react hook form documentation

- official website

1. why do we need form?

For Users in an application:

1. **Data Collection**: Forms are used to collect various types of data from users, such as text inputs, checkboxes, radio buttons, and file uploads.
2. **User Authentication and Authorization**: Forms are commonly used for user authentication and authorization processes, such as login and registration forms. They enable users to access secure areas of the application by providing credentials.
3. **User Feedback and Surveys**: Forms can be used to gather feedback from users or conduct surveys to collect valuable insights for improving the application or understanding user preferences.
4. **Data Submission**: Users can submit data through forms, triggering actions on the server-side, such as processing orders, saving information to a database, or sending messages.

For developers:

- As a developer we need to create a form, collect data from a form, apply validation in a form and show the error message
- **Validation**: Forms often include validation mechanisms to ensure that the data submitted by users meets certain criteria (e.g., required fields, correct data format). This helps maintain data integrity and improves the user experience by providing feedback on errors.

2. what is react hook form?

- a library to deal with form in React. from their official website: "Performant, flexible and extensible forms with easy-to-use validation.". It will help us to manage, submit form data and add validation with visual feedback

3. An example without react-hook-form

- create 2 forms: one for usual way to collect data (state management, changeManagement, re-render issues) and another for better performance (no re-render, no direct state + change management)

```
// make this one 2 copies
import React, { useState } from 'react';

const Signup = () => {
  return (
    <div>
      <h2>User SignUp</h2>
      <form>
        <div className="field-group">
          <label htmlFor="fullname">Fullname</label>
          <input type="text" id="fullname" name="fullname" />
        </div>
        <div className="field-group">
          <label htmlFor="email">Email</label>
          <input type="email" id="email" name="email" />
        </div>
        <div className="field-group">
          <label htmlFor="password">Password</label>
          <input type="password" id="password" name="password" />
        </div>
        <div className="field-group">
          <button type="submit">Register</button>
        </div>
      </form>
    </div>
  );
};

export default Signup;
```

```
// index.css
form {
  background-color: #213547;
  color: #f9f9f9;
  padding: 2rem;
  display: flex;
  flex-direction: column;
  justify-content: space-evenly;
  gap: 1.5rem;
}

.field-group {
  display: flex;
  flex-direction: column;
  align-items: flex-start;
  gap: 0.5rem;
}
input {
  width: 20rem;
}
```

- add states, handle change, handle submit and add error handler
    - Name: Must not be empty.
    - Email: Must be a valid email format.
    - Password: Must be at least 6 characters long.

```
import React, { ChangeEvent, FormEvent, useState } from 'react';

const Signup = () => {
  const [name, setName] = useState('');
  const [email, setEmail] = useState('');
  const [password, setPassword] = useState('');
  const [errors, setErrors] = useState<{
    name?: string;
    email?: string;
    password?: string;
  }>({});

  const handleNameChange = (event: ChangeEvent<HTMLInputElement>) => {
    setName(event.target.value);
  };

  const handleEmailChange = (event: ChangeEvent<HTMLInputElement>) => {
    setEmail(event.target.value);
  };

  const handlePasswordChange = (event: ChangeEvent<HTMLInputElement>) => {
    setPassword(event.target.value);
  };

  const validate = () => {
    const newErrors: { name?: string; email?: string; password?: string } = {};
    if (!name) {
      newErrors.name = 'Name is required';
    }
    if (!email) {
```

```
    newErrors.email = 'Email is required';
  } else if (!/\S+@\S+\.\S+/.test(email)) {
    newErrors.email = 'Email is invalid';
  }
  if (!password) {
    newErrors.password = 'Password is required';
  } else if (password.length < 6) {
    newErrors.password = 'Password must be at least 6 characters';
  }
  return newErrors;
};

const handleSubmit = (event: FormEvent) => {
  event.preventDefault();
  const validationErrors = validate();
  if (Object.keys(validationErrors).length > 0) {
    setErrors(validationErrors);
  } else {
    console.log('form is submitted');
    // Clear the form and errors after submission
    setName('');
    setEmail('');
    setPassword('');
    setErrors({});
  }
};

return (
  <div>
    <h2>User SignUp</h2>
    <form onSubmit={handleSubmit}>
      <div className="field-group">
        <label htmlFor="fullname">Fullname</label>
        <input
          type="text"
          id="fullname"
          name="fullname"
          value={name}
          onChange={handleNameChange}
        />
        {errors.name && <span className="error">{errors.name}</span>}
      </div>
      <div className="field-group">
        <label htmlFor="email">Email</label>
        <input
          type="email"
          id="email"
          name="email"
          value={email}
          onChange={handleEmailChange}
        />
        {errors.email && <span className="error">{errors.email}</span>}
      </div>
      <div className="field-group">
        <label htmlFor="password">Password</label>
        <input
          type="password"
          id="password"
          name="password"
          value={password}
          onChange={handlePasswordChange}
        />
        {errors.password && <span className="error">{errors.password}</span>}
      </div>
      <div className="field-group">
        <button type="submit">Register</button>
      </div>
    </form>
  </div>
);
};

export default Signup;
```

Explanation without library

1. **State for Errors**: Added a `errors` state to keep track of validation errors.

```
const [errors, setErrors] = useState<{
  name?: string;
  email?: string;
  password?: string;
}>({});
```

2. **Validation Function**: A `validate` function checks for errors in the input fields and returns an object containing any errors found.

```
const validate = () => {
  const newErrors: { name?: string; email?: string; password?: string } = {};
  if (!name) {
    newErrors.name = 'Name is required';
  }
```

```
  if (!email) {
    newErrors.email = 'Email is required';
  } else if (!/\S+@\S+\.\S+/.test(email)) {
    newErrors.email = 'Email is invalid';
  }
  if (!password) {
    newErrors.password = 'Password is required';
  } else if (password.length < 6) {
    newErrors.password = 'Password must be at least 6 characters';
  }
  return newErrors;
};
```

3. **Handle Submit**: The `handleSubmit` function now validates the inputs before submitting the form. If there are errors, it sets the `errors` state.

```
const handleSubmit = (event: FormEvent) => {
  event.preventDefault();
  const validationErrors = validate();
  if (Object.keys(validationErrors).length > 0) {
    setErrors(validationErrors);
  } else {
    console.log('form is submitted');
    // Clear the form and errors after submission
    setName('');
    setEmail('');
    setPassword('');
    setErrors({});
  }
};
```

4. **Display Errors**: Display error messages below each input field if there are any validation errors.

```
{
  errors.name && <span className="error">{errors.name}</span>;
}
{
  errors.email && <span className="error">{errors.email}</span>;
}
{
  errors.password && <span className="error">{errors.password}</span>;
}
```

This ensures that the form is validated before submission, providing immediate feedback to the user if any fields are invalid.

4. Add useForm Hook

- install the package `npm install react-hook-form`
- use the useForm hook (in react hook is function) the main thing to work. It will help us to manage form data, submit the data, add validation ans show the error
- it does not re-render when we update states when we work with react-hook form but when we work with plain form in react every single key stroke will re-render the component and its children (controlled components)

5. handle form states with register function

```
import React, { ChangeEvent, FormEvent, useState } from 'react';
import { useForm } from 'react-hook-form';
import { DevTool } from '@hookform/devtools';

const Signup2 = () => {
  const { register, control } = useForm();
  // register will replace the state and handleChange

  const handleSubmit = (event: FormEvent) => {};

  return (
    <div>
      <h2>User SignUp</h2>
      <form onSubmit={handleSubmit}>
        <div className="field-group">
          <label htmlFor="fullname">Fullname</label>
          <input type="text" id="fullname" {...register('fullname')} />
        </div>
        <div className="field-group">
          <label htmlFor="email">Email</label>
          <input type="email" id="email" {...register('email')} />
        </div>
        <div className="field-group">
          <label htmlFor="password">Password</label>
          <input type="password" id="password" {...register('password')} />
        </div>
        <div className="field-group">
          <button type="submit">Register</button>
        </div>
      </form>
      <DevTool control={control} /> {/* set up the dev tool */}
    </div>
  );
```

```
};

export default Signup2;
```

6. watch the changes

```
const { register, watch } = useForm<Inputs>();
console.log(watch('fullName'));
```

7. set up the DevTool

- React Hook Form DevTools to help debug forms with validation.
- install `npm install -D @hookform/devtools`
- import it `import { DevTool } from '@hookform/devtools';`
- set it up inside the component after the form

```
const { register, control } = useForm();

<form> </form>
<DevTool control={control} /> {/* set up the dev tool */}
```

8. Form Submission

```
import React, { ChangeEvent, FormEvent, useState } from 'react';
import { useForm } from 'react-hook-form';
import { DevTool } from '@hookform/devtools';

type Inputs = {
  fullName: string;
  email: string;
  password: string;
};

const Signup2 = () => {
  const { register, control, handleSubmit } = useForm<Inputs>();
  // register will replace the state and handleChange

  const onSubmit = (data: Inputs) => {
    alert(JSON.stringify(data));
  };

  return (
    <div>
      <h2>User SignUp</h2>
      <form onSubmit={handleSubmit(onSubmit)}>
        <div className="field-group">
          <label htmlFor="fullName">Fullname</label>
          <input type="text" id="fullName" {...register('fullName')} />
        </div>
        <div className="field-group">
          <label htmlFor="email">Email</label>
          <input type="email" id="email" {...register('email')} />
        </div>
        <div className="field-group">
          <label htmlFor="password">Password</label>
          <input type="password" id="password" {...register('password')} />
        </div>
        <div className="field-group">
          <button type="submit">Register</button>
        </div>
      </form>
      <DevTool control={control} /> {/* set up the dev tool */}
    </div>
  );
};

export default Signup2;
```

9. More complex example

```
import React from 'react';
import { useForm } from 'react-hook-form';
import { DevTool } from '@hookform/devtools';

enum GenderEnum {
  female = 'female',
  male = 'male',
  other = 'other',
}

type Inputs = {
  fullName: string;
  email: string;
  password: string;
  age: number;
```

```
  gender: GenderEnum;
};

const SignUp = () => {
  const { register, control, handleSubmit } = useForm<Inputs>();

  const onSubmit = (data: Inputs) => {
    console.log(data);
  };

  return (
    <div>
      <h2>User SignUp</h2>
      <form onSubmit={handleSubmit(onSubmit)}>
        <div className="field-group">
          <label htmlFor="fullName">Fullname</label>
          <input type="text" id="fullName" {...register('fullName')} />
        </div>
        <div className="field-group">
          <label htmlFor="email">Email</label>
          <input type="email" id="email" {...register('email')} />
        </div>
        <div className="field-group">
          <label htmlFor="password">Password</label>
          <input type="password" id="password" {...register('password')} />
        </div>
        <div className="field-group">
          <label htmlFor="age">Age</label>
          <input type="number" id="age" {...register('age')} />
        </div>
        <div className="field-group">
          <select {...register('gender')}>
            <option value="female">female</option>
            <option value="male">male</option>
            <option value="other">other</option>
          </select>
        </div>
        <div className="field-group">
          <button type="submit">Register</button>
        </div>
      </form>
      <DevTool control={control} /> {/* set up the dev tool */}
    </div>
  );
};

export default SignUp;
```

10. Apply Form Validation

- required, min, max, minLength, maxLength, pattern, validate

```
import React from 'react';
import { useForm } from 'react-hook-form';
import { DevTool } from '@hookform/devtools';

enum GenderEnum {
  female = 'female',
  male = 'male',
  other = 'other',
}

type Inputs = {
  fullName: string;
  email: string;
  password: string;
  age: number;
  gender: GenderEnum;
};

const SignUp = () => {
  const { register, control, handleSubmit } = useForm<Inputs>();

  const onSubmit = (data: Inputs) => {
    console.log(data);
  };

  return (
    <div>
      <h2>User SignUp</h2>
      <form onSubmit={handleSubmit(onSubmit)} noValidate>
        <div className="field-group">
          <label htmlFor="fullName">Fullname</label>
          <input
            type="text"
            id="fullName"
            {...register('fullName', {
              required: {
                value: true,
                message: 'fullName is required',
              },
              minLength: {
                value: 2,
```

```
                message: 'FullName must have atleast 2 characters',
              },
            })}
          />
        </div>
        <div className="field-group">
          <label htmlFor="email">Email</label>
          <input
            type="email"
            id="email"
            {...register('email', {
              required: {
                value: true,
                message: 'email is required',
              },
              pattern: {
                value:
                  /^[a-zA-Z0-9.!#$%&'*+/=?^_`{|}~-]+@[a-zA-Z0-9-]+(?:\.[a-zA-Z0-9-]+)*$/,
                message: 'not a valid email format',
              },
            })}
          />
        </div>
        <div className="field-group">
          <label htmlFor="password">Password</label>
          <input
            type="password"
            id="password"
            {...register('password', {
              required: {
                value: true,
                message: 'password is required',
              },
              minLength: {
                value: 6,
                message: 'password must have atleast 6 characters',
              },
              maxLength: {
                value: 15,
                message: 'password can have maximum 15 characters',
              },
            })}
          />
        </div>
        <div className="field-group">
          <label htmlFor="age">Age</label>
          <input
            type="number"
            id="age"
            {...register('age', {
              required: {
                value: true,
                message: 'Age is required',
              },
              min: {
                value: 18,
                message: 'Minimum age can be 18',
              },
            })}
          />
        </div>
        <div className="field-group">
          <select {...register('gender')}>
            <option value="female">female</option>
            <option value="male">male</option>
            <option value="other">other</option>
          </select>
        </div>
        <div className="field-group">
          <button type="submit">Register</button>
        </div>
      </form>
      <DevTool control={control} /> {/* set up the dev tool */}
    </div>
  );
};

export default SignUp;
```

11. Show Error Message

```
import React from 'react';
import { useForm } from 'react-hook-form';
import { DevTool } from '@hookform/devtools';

enum GenderEnum {
  female = 'female',
  male = 'male',
  other = 'other',
}

type Inputs = {
  fullName: string;
```

```
  email: string;
  password: string;
  age: number;
  gender: GenderEnum;
};

const SignUp = () => {
  const { register, control, handleSubmit, formState } = useForm<Inputs>();
  const { errors } = formState;

  const onSubmit = (data: Inputs) => {
    console.log(data);
  };

  return (
    <div>
      <h2>User SignUp</h2>
      <form onSubmit={handleSubmit(onSubmit)} noValidate>
        <div className="field-group">
          <label htmlFor="fullName">Fullname</label>
          <input
            type="text"
            id="fullName"
            {...register('fullName', {
              required: {
                value: true,
                message: 'fullName is required',
              },
              minLength: {
                value: 2,
                message: 'FullName must have atleast 2 characters',
              },
            })}
          />
          {errors.fullName && (
            <span className="error">{errors.fullName.message}</span>
          )}
        </div>
        <div className="field-group">
          <label htmlFor="email">Email</label>
          <input
            type="email"
            id="email"
            {...register('email', {
              required: {
                value: true,
                message: 'email is required',
              },
              pattern: {
                value:
                  /^[a-zA-Z0-9.!#$%&'*+/=?^_`{|}~-]+@[a-zA-Z0-9-]+(?:\.[a-zA-Z0-9-]+)*$/,
                message: 'not a valid email format',
              },
            })}
          />
          {errors.email && (
            <span className="error">{errors.email.message}</span>
          )}
        </div>
        <div className="field-group">
          <label htmlFor="password">Password</label>
          <input
            type="password"
            id="password"
            {...register('password', {
              required: {
                value: true,
                message: 'password is required',
              },
              minLength: {
                value: 6,
                message: 'password must have atleast 6 characters',
              },
              maxLength: {
                value: 15,
                message: 'password can have maximum 15 characters',
              },
            })}
          />
          {errors.password && (
            <span className="error">{errors.password.message}</span>
          )}
        </div>
        <div className="field-group">
          <label htmlFor="age">Age</label>
          <input
            type="number"
            id="age"
            {...register('age', {
              required: {
                value: true,
                message: 'Age is required',
              },
              min: {
```

```
                value: 18,
                message: 'Minimum age can be 18',
              },
            })}
          />
          {errors.age && <span className="error">{errors.age.message}</span>}
        </div>
        <div className="field-group">
          <select {...register('gender')}>
            <option value="female">female</option>
            <option value="male">male</option>
            <option value="other">other</option>
          </select>
        </div>
        <div className="field-group">
          <button type="submit">Register</button>
        </div>
      </form>
      <DevTool control={control} /> {/* set up the dev tool */}
    </div>
  );
};

export default SignUp;
```

Upload image to cloudinary

add image for user sign up && cloudinary url for storing image

- create the image input field
- show the preview
- register in cloudinary, set upload preset with unsigned: Go to settings => then go to upload and get the unsigned value that will be needed

```
/* Styling for form header */
.form h2 {
  font-size: 1.8rem;
  font-weight: bold;
  color: var(--primary-color);
  text-align: center;
  margin-bottom: 1.5rem;
  position: relative;
}

/* Optional: Add underline or decorative line below the heading */
.form h2::after {
  content: '';
  display: block;
  width: 50px;
  height: 3px;
  background-color: var(--primary-color);
  margin: 0.5rem auto 0;
}

/* General form styling */
.form {
  max-width: 500px;
  margin: 2rem auto;
  padding: 2rem;
  background-color: #fff;
  border-radius: var(--border-radius);
  box-shadow: var(--box-shadow);
}

.form-group {
  margin-bottom: 1.5rem;
  display: flex;
  flex-direction: column;
}

.form-group label {
  margin-bottom: 0.5rem;
  font-weight: bold;
  color: var(--primary-color);
}

.form-group input[type='text'],
.form-group input[type='email'],
.form-group input[type='number'],
.form-group input[type='file'],
.form-group select {
  padding: 0.75rem;
  border: 1px solid #ccc;
  border-radius: var(--border-radius);
  font-size: 1rem;
  transition: var(--transition);
}

.form-group input[type='text']:focus,
.form-group input[type='email']:focus,
.form-group input[type='number']:focus,
```

```css
.form-group input[type='file']:focus,
.form-group select:focus {
  outline: none;
  border-color: var(--primary-color);
  box-shadow: 0 0 5px rgba(76, 175, 80, 0.3);
}

button[type='submit'] {
  width: 100%;
  padding: 0.75rem;
  font-size: 1.1rem;
  background-color: var(--primary-color);
  color: #fff;
  border: none;
  border-radius: var(--border-radius);
  cursor: pointer;
  transition: var(--transition);
}

button[type='submit']:hover {
  background-color: var(--secondary-color);
}

.form-group img {
  width: 100px;
  height: 100px;
  object-fit: cover;
  margin-top: 1rem;
  border-radius: var(--border-radius);
  box-shadow: var(--box-shadow);
}

/* Error message styling */
.form-group p {
  color: #d9534f; /* Bootstrap’s “danger” red */
  font-size: 0.9rem;
  margin-top: 0.25rem;
  margin-bottom: 0;
}

/* Error message styling with icon */
.form-group p::before {
  content: '⚠ ';
  margin-right: 0.25rem;
  font-size: 1rem;
  vertical-align: middle;
}
```

```tsx
// Register.tsx
import { registerUser } from '@/tookit/slices/userSlice';
import { AppDispatch } from '@/tookit/store';
import { uploadImageToCloudinary } from '@/utils/cloudinary';
import React, { useState } from 'react';
import { SubmitHandler, useForm } from 'react-hook-form';
import { useDispatch } from 'react-redux';
import { useNavigate } from 'react-router-dom';
import { toast } from 'react-toastify';

type FormData = {
  name: string;
  email: string;
  password: string;
  image: FileList;
  phone: string;
  address: string;
};

export const Register = () => {
  const navigate = useNavigate();
  const dispatch: AppDispatch = useDispatch();
  const {
    register,
    handleSubmit,
    formState: { errors },
  } = useForm<FormData>();

  const [imagePreview, setImagePreview] = useState<string | null>(null);

  const onSubmit: SubmitHandler<FormData> = async (data) => {
    try {
      let imageUrl = '';
      if (data.image && data.image.length > 0) {
        const file = data.image[0];

        imageUrl = await uploadImageToCloudinary(file);
        console.log(imageUrl);
      }
      const userData = {
        ...data,
        image: imageUrl,
      };
      const response = await dispatch(registerUser(userData));
      console.log('Response from Register: ' + response);
```

```
      toast.success(response.payload.message);
      navigate('/login');
    } catch (error: any) {
      toast.error(error.message || 'Registration failed');
    }
  };

  const handleImageChange = (event: React.ChangeEvent<HTMLInputElement>) => {
    const file = event.target.files?.[0];
    if (file) {
      setImagePreview(URL.createObjectURL(file));
    }
  };

  return (
    <div className="register">
      <h2>User Registration</h2>
      <form onSubmit={handleSubmit(onSubmit)}>
        <div className="form-field">
          <label htmlFor="name"> Name: </label>
          <input
            type="text"
            {...register('name', {
              required: 'Name is required',
              minLength: {
                value: 2,
                message: 'Name must be at least 2 characters',
              },
            })}
          />
          {errors.name && <p>{errors.name.message}</p>}
        </div>
        <div className="form-field">
          <label htmlFor="name"> Email: </label>
          <input
            type="email"
            {...register('email', {
              required: 'Email is required',
              pattern: {
                value: /^[^@ ]+@[^@ ]+\.[^@ .]{2,}$/,
                message: 'Email is not valid',
              },
            })}
          />
          {errors.email && <p>{errors.email.message}</p>}
        </div>

        <div className="form-field">
          <label htmlFor="name"> password: </label>
          <input
            type="password"
            {...register('password', {
              required: 'Password is required',
              minLength: {
                value: 6,
                message: 'Pssword must be at least 6 characters',
              },
            })}
          />
          {errors.password && <p>{errors.password.message}</p>}
        </div>

        <div className="form-field">
          <label htmlFor="address"> Address: </label>
          <textarea id="" {...register('address')}></textarea>
        </div>

        <div className="form-field">
          <label htmlFor="image"> Image: </label>
          <input
            type="file"
            accept="image/*"
            {...register('image')}
            onChange={handleImageChange}
          />
          {imagePreview && (
            <img
              src={imagePreview}
              alt="Image Preview"
              className="image-preview"
            />
          )}
        </div>

        <button className="btn" type="submit">
          Register
        </button>
      </form>
    </div>
  );
};

// we will add image -> for user register
// login function
```

```ts
// utils/cloudinary.ts
export const uploadImageToCloudinary = async (file: File): Promise<string> => {
  const formData = new FormData();
  formData.append('file', file);
  formData.append('upload_preset', 'ulifygv2'); // Ensure you have set up an upload preset in Cloudinary
  formData.append('folder', 'e-commerce-sda2'); // Specify the folder where you want to store the image

  try {
    const response = await fetch(
      `https://api.cloudinary.com/v1_1/anisul-cloud/image/upload`,
      {
        method: 'POST',
        body: formData,
      }
    );

    if (!response.ok) {
      throw new Error('Failed to upload image');
    }

    const data = await response.json();
    return data.secure_url; // Return the secure URL of the uploaded image
  } catch (error) {
    console.error('Error uploading image to Cloudinary:', error);
    throw error;
  }
};
```

env variable setup in vite app

To set up environment variables in a Vite React app, follow these steps:

Step 1: Create Environment Files

Vite supports different environment files for development, production, or custom environments. Each environment file should be in the root of your project.

1. Create a `.env` file in the root for general environment variables:

```
VITE_API_URL=https://example.com/api
VITE_APP_NAME=MyViteApp
```

2. (Optional) Create environment-specific files:
   - `.env.development` – For development environment
   - `.env.production` – For production environment

   Example for `.env.development`:

```
VITE_API_URL=http://localhost:3000
```

Step 2: Use Environment Variables in Your App

Vite requires that environment variables be prefixed with `VITE_` to be accessible in the app.

```jsx
// src/App.jsx or any other component
import React from 'react';

const App = () => {
  const apiUrl = import.meta.env.VITE_API_URL; // Access environment variable
  const appName = import.meta.env.VITE_APP_NAME;

  return (
    <div>
      <h1>Welcome to {appName}</h1>
      <p>API URL: {apiUrl}</p>
    </div>
  );
};

export default App;
```

Step 3: Run the App

The `.env` or `.env.development` files will automatically be used when running the app in development mode with `npm run dev`, and `.env.production` when building for production with `npm run build`.

Step 4: Add `.env` Files to `.gitignore` (Optional)

If your environment files contain sensitive information, add them to `.gitignore`:

```
.env
.env.development
.env.production
```

Summary

- Prefix all environment variables with `VITE_`.
- Use `import.meta.env` to access them in your components.
- Separate environment files can manage different configurations for development, testing, and production environments.

Delete Image from cloudinary

```
// get the publicId
const extractPublicId = (url) => {
  const parts = url.split('/');
  const filename = parts[parts.length - 1];
  return filename.split('.')[0]; // Remove the file extension
};

const url =
  'https://res.cloudinary.com/anisul-cloud/image/upload/v1730135693/user-mgt-app/cc0odyobftx8ofuaov6l.jpg';
const publicId = extractPublicId(url);
console.log(publicId); // Output: cc0odyobftx8ofuaov6l

// delete the image
const handleDelete = async (id, publicId) => {
  try {
    await deleteImageFromCloudinary(publicId);
    setUsers((prevUsers) => prevUsers.filter((user) => user.id !== id));
  } catch (error) {
    console.error('Failed to delete image:', error);
  }
};

export const deleteImageFromCloudinary = async (publicId) => {
  const cloudinaryCloudName = import.meta.env.VITE_CLOUDINARY_CLOUD_NAME;

  try {
    const response = await fetch(
      `https://api.cloudinary.com/v1_1/${cloudinaryCloudName}/resources/image/upload/${publicId}`,
      {
        method: 'DELETE',
      }
    );

    if (!response.ok) {
      throw new Error('Failed to delete image');
    }

    const data = await response.json();
    return data;
  } catch (error) {
    console.error('Error deleting image:', error);
    throw error;
  }
};
```

1.14 data passing: child to parent component, state lifting

- **Code Example - 40 (state lifting)**

```
// App.js
step 1: create a callback function that will help us to get the data from child component
  const handleAddNewProduct = (newProduct) => {
    console.log(newProduct);
  };

 step 2: pass the function as props to child to component
 <NewProduct onHandleAddNewProduct={handleAddNewProduct} />

step 3: receive the function props and use it for passing the data from child to parent
// NewProduct.js
import React, { useState } from 'react';

import PropTypes from 'prop-types';

import Card from './Card';

const NewProduct = (props) => {
  const [product, setProduct] = useState({
    title: '',
    description: '',
    price: '',
    category: '',
    image: '',
  });

  const handleChange = (event) => {
    setProduct((prevState) => ({
      ...prevState,
      [event.target.name]: event.target.value,
    }));
  };
```

```
  const handleSubmit = (event) => {
    event.preventDefault();
    const newProduct = {
      id: new Date().getTime().toString(),
      ...product,
    };
    props.onHandleAddNewProduct(newProduct);
    setProduct({
      title: '',
      description: '',
      price: '',
      category: '',
      image: '',
    });
  };

  return (
    <Card>
      <div className="new-product">
        <h2>Add Product</h2>
        <form className="product-form" onSubmit={handleSubmit}>
          <div className="form__control">
            <label htmlFor="title">Title: </label>
            <input
              type="text"
              id="title"
              name="title"
              value={product.title}
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="price">Price: </label>
            <input
              type="number"
              id="price"
              name="price"
              value={product.price}
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Description: </label>
            <textarea
              id="description"
              name="description"
              value={product.description}
              onChange={handleChange}
              required
            />
          </div>

          <div className="form__control">
            <label htmlFor="description">Category: </label>
            <select
              id="category"
              name="category"
              value={product.category}
              onChange={handleChange}
              required
            >
              <option value="">Select a category</option>
              <option value="men's clothing">men's clothing</option>
              <option value="jewelery">jewelery</option>
              <option value="electronics">Electronics</option>
              <option value="books">Books</option>
              <option value="furniture">Furniture</option>
            </select>
          </div>

          <div className="form__control">
            <label htmlFor="image">Image URL: </label>
            <textarea
              id="image"
              name="image"
              onChange={handleChange}
              value={product.image}
              required
            />
          </div>

          <button className="button" type="submit">
            Create Product
          </button>
        </form>
      </div>
    </Card>
  );
};
```

```
NewProduct.propTypes = {
  onHandleAddNewProduct: PropTypes.func,
};

export default NewProduct;

// Home.jsx
  const handleAddNewProduct = (newProduct) => {
    setProducts((prevProducts) => [...prevProducts, newProduct]);
  };
```

- **Code Example - 41 (state lifting for delete operation)**

```
// In Home.jsx
const handleDeleteProduct = (id) => {
  console.log(id);
};

// pass function to children component
<Products products={products} onHandleDeleteProduct={handleDeleteProduct} />;

// receive function
const handleDeleteProduct = (id) => {
  props.onHandleDeleteProduct(id);
};

// In Home.jsx
const handleDeleteProduct = (id) => {
  const filteredProducts = products.filter((product) => product.id !== id);
  setProducts(filteredProducts);
};
```

- **Code Example - 42 (use the useState function)**

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

import Sidebar from '../components/Sidebar';
import Products from '../components/Products';
import { products as productsData } from '../data';
import NewProduct from '../components/NewProduct';

const Home = () => {
  const [products, setProducts] = useState(productsData);

  return (
    <div className="container flex-space-around">
      <Sidebar />
      <div className="main-content">
        <NewProduct setProducts={setProducts} />
        <Products products={products} setProducts={setProducts} />
      </div>
    </div>
  );
};

export default Home;

// Products.jsx
import React from 'react';
import PropTypes from 'prop-types';
import { nanoid } from 'nanoid';

import Product from './Product';

const Products = (props) => {
  const { products } = props;

  return (
    <section className="products">
      {products.length > 0 &&
        products.map((product) => (
          <Product
            product={product}
            key={product.id}
            products={products}
            setProducts={props.setProducts}
          />
        ))}
      {products.length === 0 && <p>No products available</p>}
    </section>
  );
};

Products.propTypes = {
  products: PropTypes.arrayOf(
    PropTypes.shape({
      id: PropTypes.number,
      title: PropTypes.string,
      price: PropTypes.number,
      description: PropTypes.string,
      category: PropTypes.string,
```

```
      image: PropTypes.string,
      rating: PropTypes.shape({
        rate: PropTypes.number,
        count: PropTypes.number,
      }),
    })
  ),
  setProducts: PropTypes.func.isRequired,
};

export default Products;

// Product.jsx
import React from 'react';
import PropTypes from 'prop-types';

import Card from './Card';

const Product = (props) => {
  const { product } = props;

  const handleShowDetails = (product) => {
    alert(JSON.stringify(product));
  };
  const handleAddToCart = (product) => {
    alert(JSON.stringify(product));
  };
  const handleDeleteProduct = (id) => {
    const filteredProducts = props.products.filter(
      (product) => product.id !== id
    );
    props.setProducts(filteredProducts);
  };

  return (
    <Card>
      <article className="product">
        <img className="product__img" src={product.image} alt={product.title} />
        <p className="product__title">{product.title}</p>
        <p className="product__description">
          {product.description.substring(0, 40)}
          ...
        </p>
        <p className="product__price">Price: {product.price}</p>
        <p>Category: {product.category}</p>
        <p>Rating: {product.rating.rate}/5</p>
        <div className="product__btns flex-space-around">
          <button className="button" onClick={() => handleShowDetails(product)}>
            Show Details
          </button>
          <button className="button" onClick={() => handleAddToCart(product)}>
            Add To Cart
          </button>
          <button
            className="button"
            onClick={() => handleDeleteProduct(product.id)}
          >
            Delete Product
          </button>
        </div>
      </article>
    </Card>
  );
};

Product.propTypes = {
  product: PropTypes.shape({
    id: PropTypes.number.isRequired,
    title: PropTypes.string,
    price: PropTypes.number,
    description: PropTypes.string,
    category: PropTypes.string,
    image: PropTypes.string,
    rating: PropTypes.shape({
      rate: PropTypes.number,
      count: PropTypes.number,
    }),
  }),
  setProducts: PropTypes.func.isRequired,
  products: PropTypes.arrayOf(
    PropTypes.shape({
      id: PropTypes.number,
      title: PropTypes.string,
      price: PropTypes.number,
      description: PropTypes.string,
      category: PropTypes.string,
      image: PropTypes.string,
      rating: PropTypes.shape({
        rate: PropTypes.number,
        count: PropTypes.number,
      }),
    })
  ),
};
```

```
export default Product;
```

1.15 useRef hook - Uncontrolled component

- If we look at the AddTodo component then you will see we are not using those title and desc state inside the component that much so we can avoid state and make the component stateless
- **Code Example - 43 (useRef hook for getting form value)**

```
import React, { useRef } from 'react';
import PropTypes from 'prop-types';

import { getUniqueId } from '../utility/getUniqueId';

const AddTodo = (props) => {
  const titleRef = useRef('');
  const descRef = useRef('');

  const handleSubmit = (event) => {
    event.preventDefault();
    const title = titleRef.current.value;
    const desc = descRef.current.value;
    const newTodo = { id: getUniqueId(), title, desc };
    props.onHandleAddNewTodo(newTodo);
    titleRef.current.value = '';
    descRef.current.value = '';
  };

  return (
    <div className="form-container">
      <form onSubmit={handleSubmit}>
        <h2 className="form-title">Add New Todo</h2>
        <div className="form-input">
          <label htmlFor="title">Todo Title: </label>
          <input
            type="text"
            name="title"
            id="title"
            ref={titleRef}
            required
            autoFocus
          />
        </div>
        <div className="form-input">
          <label htmlFor="desc">Todo description: </label>
          <textarea name="desc" id="desc" ref={descRef} required></textarea>
        </div>
        <div className="form-input">
          <button type="submit" className="btn form-btn">
            Add Todo
          </button>
        </div>
      </form>
    </div>
  );
};

AddTodo.propTypes = {
  onHandleAddNewTodo: PropTypes.func,
};

export default AddTodo;
```

1.16 dynamic styling in React

- Now lets add some conditional styling
- **Code Example - 44 (conditional styling)**

```
import React, { useState, useEffect } from 'react';
import PropTypes from 'prop-types';

import { getUniqueId } from '../utility/getUniqueId';

const AddTodo = (props) => {
  const [title, setTitle] = useState('');
  const [desc, setDesc] = useState('');

  const [isTitleValid, setIsTitleValid] = useState(false);
  const [isDescValid, setIsDescValid] = useState(false);

  useEffect(() => {
    if (title.trim().length > 3) {
      setIsTitleValid(true);
    }
    if (desc.trim().length > 9) {
      setIsDescValid(true);
    }
  }, [title, desc]);
```

```
  const handleTitleChange = (event) => {
    setTitle(event.target.value);
  };

  const handleDescriptionChange = (event) => {
    setDesc(event.target.value);
  };

  const handleSubmit = (event) => {
    event.preventDefault();

    const newTodo = { id: getUniqueId(), title, desc };
    props.onHandleAddNewTodo(newTodo);
    setTitle('');
    setDesc('');
  };

  return (
    <div className="form-container">
      <pre style={{ backgroundColor: 'white' }}>
        {JSON.stringify({ id: getUniqueId(), title, desc }, undefined, 2)}
      </pre>
      <form onSubmit={handleSubmit}>
        <h2 className="form-title">Add New Todo</h2>
        <div className="form-input">
          <label htmlFor="title">Todo Title: </label>
          <input
            type="text"
            name="title"
            id="title"
            value={title}
            onChange={handleTitleChange}
            required
            autoFocus
          />
          {!isTitleValid && <p>Title Should be at least 4 characters</p>}
        </div>
        <div className="form-input">
          <label htmlFor="desc">Todo description: </label>
          <textarea
            name="desc"
            id="desc"
            value={desc}
            onChange={handleDescriptionChange}
            required
          ></textarea>
          {!isDescValid && (
            <p>Description Should be at least 10 characters</p>
          )}
        </div>
        <div className="form-input">
          <button
            type="submit"
            className="btn form-btn"
            disabled={!(isTitleValid && isDescValid)}
          >
            Add Todo
          </button>
        </div>
      </form>
    </div>
  );
};

AddTodo.propTypes = {
  onHandleAddNewTodo: PropTypes.func,
};

export default AddTodo;
```

Assignment - 3: Add New Product

1.17 class component

1.18 state, setState, event handler

- state is a js object for storing current situation of a component
- **Code Example - 44 (Counter App using class component)**

```
// App.js
import React from 'react';

import Counter from './components/Counter';

const App = () => {
  return (
    <div>
      <Counter />
    </div>
```

```
  );
};

export default App;
```

```
// Counter.js
import React, { Component } from 'react';

export default class Counter extends Component {
  constructor(props) {
    super(props);

    this.state = {
      count: 0,
    };
  }

  handleIncrement = () => {
    this.setState({
      count: this.state.count + 1,
    });
  };

  render() {
    return (
      <div>
        <h2>Counter: {this.state.count}</h2>
        <button onClick={this.handleIncrement}>+</button>
      </div>
    );
  }
}
```

[1.19 react todo projects]

- react todo project

2. Intermediate React.js Topics

2.1 life cycle methods of a class component

- **Code Example - 45 (life cycle methods of a class component)**

```
// Counter App
import React, { Component } from "react";

class Counter extends Component {
  constructor(props) {
    super(props);

    this.state = {
      count: 0,
    };
  }

  handleIncrement = () => {
    this.setState({
      count: this.state.count + 1,
    });
  };

  render() {
    return (
      <div>
        <h2>Count: {this.state.count}</h2>
        <button onClick={this.handleIncrement}>Increment</button>
      </div>
    );
  }
}
export default Counter;

// LifeCycle Methods
import React, { Component } from 'react';
// mounting - constructor -> render -> componentDidMount() (it will be called once, API Call is recommended here)
// updating - state/props ->  shouldComponentUpdate()-> render -> componentDidUpdate ->
// unmounting -> componentDidUnmount()
class LifeCycle extends Component {
    constructor(props) {
        super(props);
        console.log('constructor');
        this.state = {
            count: 0
        };
    }

    handleIncrement = () => {
        this.setState({
            count: this.state.count + 1
```

```
        });
    };
    componentDidMount() {
        console.log('componentDidMount');
    }
    componentDidUpdate() {
        console.log('componentDidUpdate');
    }
    shouldComponentUpdate() {
        console.log('shouldComponentUpdate()');
        return true;
    }

    render() {
        console.log('render');
        return (
            <div>
                <h2>Count: {this.state.count}</h2>
                <button onClick={this.handleIncrement}>Increment</button>
            </div>
        );
    }
}
export default LifeCycle;
```

2.2 useEffect Hook

- A very important hook that every react developers should know. The `useEffect` hook in React allows you to perform side effects (outside of the scope of your app) in your functional components. Side effects can include making a network request to an API outside of your app for fetching data, manually DOM manipulation, setting up subscriptions, browser scrolling, and more. It's a crucial hook for managing the lifecycle of your components.
- **Rule: Don't call Hooks inside loops, conditions, or nested functions**

useEffct = componentDidMount + componentDidUpdate + componentWillUnmount

Here's how to use the `useEffect` hook in a React component:

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

function ExampleComponent() {
  // State and other code here

  useEffect(() => {
    // This function will run after the component renders

    // Place your side effect code here
    console.log('Component has rendered');

    // If needed, you can return a cleanup function
    return () => {
      // This code will run before the component unmounts
      console.log('Component will unmount');
    };
  }, []); // Dependency array (optional)

  return (
    // JSX to render
  );
}

export default ExampleComponent;
```

Key points about the `useEffect` hook:

1. The `useEffect` hook takes two arguments:
    - The first argument is a function that contains your side effect code.
    - The second argument is an array of dependencies. If any of these dependencies change, the side effect function will be re-executed. If you want the side effect to run only once (similar to `componentDidMount` in class components), you can pass an empty array (`[]`) as the second argument.
2. The side effect function is run after the component has rendered. It can run multiple times if the dependencies change (if provided in the dependency array).
3. You can return a cleanup function from the side effect function. This cleanup function will run before the component unmounts. It's useful for unsubscribing from subscriptions, canceling network requests, or any cleanup work.

- **Code Example - 46 (useEffect hook)**

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

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

  // useEffect(() => {
  //   //Runs on every render
  // });
```

```
  // useEffect(() => {
  //   //Runs only on the first render
  // }, []);

  // useEffect(() => {
  //   //Runs on the first render
  //   //And any time any dependency value changes
  // }, [prop, state]);

  //Runs on every render
  // useEffect(() => {
  //   console.log("useEffect: " + count);
  // });

  //Runs only on the first render
  // useEffect(() => {
  //   console.log(count);
  // }, []);

  //Runs on the first render and also when the dependecy value changes
  useEffect(() => {
    console.log(count);
  }, [count]);

  return (
    <div>
      <h1>Count: {count}</h1>
      <button
        onClick={() => {
          setCount((count) => count + 1);
        }}
      >
        +
      </button>
    </div>
  );
};

export default UseEffectHook;
```

```
// Another example
import React, { useState, useEffect } from 'react';

const UseEffectExample = () => {
  const [count, setCount] = useState(0);
  const [greeting, setGreeting] = useState('good morning');
  useEffect(() => {
    console.log('hello from useeffect');
  }, [count]);

  return (
    <div>
      <h2>Count: {count}</h2>
      <button
        onClick={() => {
          setCount((count) => count + 1);
        }}
      >
        +
      </button>
      <button
        onClick={() => {
          setGreeting(greeting + '2');
        }}
      >
        greeting
      </button>
      <p>{greeting}</p>
    </div>
  );
};

export default UseEffectExample;
```

- A good example of cleanup function in useEffect

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

const Timer = () => {
  const [seconds, setSeconds] = useState(0);

  useEffect(() => {
    const interval = setInterval(() => {
      setSeconds((prevSeconds) => prevSeconds + 1);
    }, 1000);

    // Cleanup function to clear the interval when the component unmounts
    return () => {
      console.log('unmount');
      clearInterval(interval);
    };
  }, []); // Empty dependency array means this effect runs once on mount and cleans up on unmount
```

```
  return (
    <div>
      <h2>Timer: {seconds} seconds</h2>
    </div>
  );
};

const App = () => {
  const [showTimer, setShowTimer] = useState(true);

  const toggleTimer = () => {
    setShowTimer(!showTimer);
  };

  return (
    <div>
      <h1>React Component Unmounting Example</h1>
      <button onClick={toggleTimer}>
        {showTimer ? 'Hide Timer' : 'Show Timer'}
      </button>
      {showTimer && <Timer />}
    </div>
  );
};

export default App;
```

Here's a breakdown of how you might use the `useEffect` hook for common scenarios:

- **Data Fetching**: Fetch data when the component mounts, and clean up any resources when it unmounts.

```
useEffect(() => {
  const fetchData = async () => {
    // Fetch data here
  };

  fetchData();

  return () => {
    // Cleanup resources (e.g., cancel network request)
  };
}, []);
```

- **Updating the Title**: Change the document title when the component mounts.

```
useEffect(() => {
  document.title = 'New Page Title';

  return () => {
    document.title = 'Previous Page Title';
  };
}, []);
```

- **Listening for State Changes**: Execute code when specific state values change.

```
useEffect(() => {
  // Execute code when someStateValue changes
}, [someStateValue]);
```

- **Subscription Management**: Subscribe to a service and unsubscribe when the component unmounts.

```
useEffect(() => {
  const subscription = service.subscribe((data) => {
    // Handle data
  });

  return () => {
    subscription.unsubscribe();
  };
}, []);
```

fatch data using useEffect Hook

- **Code Example - 47 (fetch data using useEffect hook)**

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

import Sidebar from '../components/Sidebar';
import Products from '../components/Products';
import NewProduct from '../components/NewProduct';

// <https://fakestoreapi.com/docs>

const Home = () => {
  const [products, setProducts] = useState([]);
  const [isLoading, setIsLoading] = useState(false);
```

```
  const [error, setError] = useState(null);

  const fetchData = () => {
    setIsLoading(true);
    setError(null);

    fetch('https://fakestoreapi.com/products')
      .then((res) => {
        if (!res.ok) {
          throw new Error('Could not fetch the data');
        }
        return res.json();
      })
      .then((data) => setProducts(data))
      .catch((error) => setError(error.message))
      .finally(() => setIsLoading(false));
  };

  useEffect(() => {
    fetchData();
  }, []);

  return (
    <div className="container flex-space-around">
      <Sidebar />
      <div className="main-content">
        <NewProduct setProducts={setProducts} />
        {isLoading && <p>Products are loading...</p>}
        {error && <p>{error}</p>}
        {!isLoading && !error && (
          <Products products={products} setProducts={setProducts} />
        )}
      </div>
    </div>
  );
};

export default Home;
```

- **Code Example - 48 (fetch data using useEffect hook - async await)**

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

import Sidebar from '../components/Sidebar';
import Products from '../components/Products';
import NewProduct from '../components/NewProduct';

// <https://fakestoreapi.com/docs>

const Home = () => {
  const [products, setProducts] = useState([]);
  const [isLoading, setIsLoading] = useState(false);
  const [error, setError] = useState(null);

  const fetchData = async () => {
    setIsLoading(true);
    setError(null);

    try {
      const res = await fetch('https://fakestoreapi.com/products');
      if (!res.ok) {
        throw new Error('Could not fetch the data');
      }
      const data = await res.json();
      setProducts(data);
    } catch (err) {
      setError(err.message);
    } finally {
      setIsLoading(false);
    }
  };

  useEffect(() => {
    fetchData();
  }, []);

  return (
    <div className="container flex-space-around">
      <Sidebar />
      <div className="main-content">
        <NewProduct setProducts={setProducts} />
        {isLoading && <p>Products are loading...</p>}
        {error && <p>{error}</p>}
        {!isLoading && !error && (
          <Products products={products} setProducts={setProducts} />
        )}
      </div>
    </div>
  );
};

export default Home;
```

[AbortController and cleanup function]

- Code Example - 49 (AbortController)

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

import Sidebar from '../components/Sidebar';
import Products from '../components/Products';
import NewProduct from '../components/NewProduct';

const Home = () => {
  const [products, setProducts] = useState([]);
  const [isLoading, setIsLoading] = useState(false);
  const [error, setError] = useState(null);

  useEffect(() => {
    const controller = new AbortController();
    const signal = controller.signal;

    const fetchData = async () => {
      setIsLoading(true);
      setError(null);

      try {
        const response = await fetch('https://fakestoreapi.com/products', {
          signal,
        });
        if (!response.ok) {
          throw new Error('Could not fetch the data');
        }
        console.log(signal);

        const data = await response.json();
        setProducts(data);
      } catch (err) {
        if (err.name !== 'AbortError') {
          setError(err.message);
        }
      } finally {
        setIsLoading(false);
      }
    };

    fetchData();

    return () => {
      controller.abort();
      console.log(signal);
    };
  }, []);

  return (
    <div className="container flex-space-around">
      <Sidebar />
      <div className="main-content">
        <NewProduct setProducts={setProducts} />
        {isLoading && <p>Products are loading...</p>}
        {error && <p>{error}</p>}
        {!isLoading && !error && (
          <Products products={products} setProducts={setProducts} />
        )}
      </div>
    </div>
  );
};

export default Home;
```

[How to make a POST request]

- code example - 50 (POST Request / Create Resource)

```
import React, { useState } from 'react';
import PropTypes from 'prop-types';

import Card from './Card';

const NewProduct = (props) => {
  const [product, setProduct] = useState({
    title: '',
    description: '',
    price: '',
    category: '',
    image: '',
  });

  const [errors, setErrors] = useState({});

  const validate = () => {
    const errors = {};
    if (!product.title) errors.title = 'Title is required';
    else if (product.title.length < 2) {
```

```
    errors.title = 'Title must have at least 2 characters';
  }
  if (!product.description) errors.description = 'Description is required';
  if (!product.price) errors.price = 'Price is required';
  if (!product.category) errors.category = 'Category is required';
  if (!product.image) errors.image = 'Image URL is required';
  return errors;
};

const handleChange = (event) => {
  setProduct((prevState) => ({
    ...prevState,
    [event.target.name]: event.target.value,
  }));
};

const handleSubmit = (event) => {
  event.preventDefault();
  const validationErrors = validate();
  if (Object.keys(validationErrors).length > 0) {
    setErrors(validationErrors);
  } else {
    // make api call
    fetch('https://fakestoreapi.com/products', {
      method: 'POST',
      body: JSON.stringify({ ...product }),
    })
      .then((res) => {
        if (!res.ok) {
          throw new Error('Could not fetch the data');
        }
        return res.json();
      })
      .then((json) => {
        console.log('product is created');
        console.log(json);
      });
    const newProduct = {
      id: new Date().getTime(),
      ...product,
    };
    console.log(typeof newProduct.id);
    props.setProducts((prevProducts) => [...prevProducts, newProduct]);
    setErrors({});
  }
};

return (
  <Card>
    <div className="new-product">
      <h2>Add Product</h2>
      <form className="product-form" onSubmit={handleSubmit}>
        <div className="form__control">
          <label htmlFor="title">Title: </label>
          <input
            type="text"
            id="title"
            name="title"
            value={product.title}
            onChange={handleChange}
          />
          {errors.title && <p className="error">{errors.title}</p>}
        </div>

        <div className="form__control">
          <label htmlFor="price">Price: </label>
          <input
            type="number"
            id="price"
            name="price"
            value={product.price}
            onChange={handleChange}
          />
          {errors.price && <p className="error">{errors.price}</p>}
        </div>

        <div className="form__control">
          <label htmlFor="description">Description: </label>
          <textarea
            id="description"
            name="description"
            value={product.description}
            onChange={handleChange}
          />
          {errors.description && (
            <p className="error">{errors.description}</p>
          )}
        </div>

        <div className="form__control">
          <label htmlFor="category">Category: </label>
          <select
            id="category"
            name="category"
```

```
            value={product.category}
            onChange={handleChange}
          >
            <option value="">Select a category</option>
            <option value="men's clothing">men's clothing</option>
            <option value="jewelery">jewelery</option>
            <option value="electronics">Electronics</option>
            <option value="books">Books</option>
            <option value="furniture">Furniture</option>
          </select>
          {errors.category && <p className="error">{errors.category}</p>}
        </div>

        <div className="form__control">
          <label htmlFor="image">Image URL: </label>
          <textarea
            id="image"
            name="image"
            onChange={handleChange}
            value={product.image}
          />
          {errors.image && <p className="error">{errors.image}</p>}
        </div>

        <button className="button" type="submit">
          Create Product
        </button>
      </form>
    </div>
  </Card>
 );
};

NewProduct.propTypes = {
  setProducts: PropTypes.func.isRequired,
};

export default NewProduct;
```

[Create services for making http requests]

- code example - 51 (create service)

```
// create a services folder
// services/productServices.js
const BASE_URL = 'https://fakestoreapi.com/';

const createProduct = async (product) => {
  try {
    const response = await fetch(`${BASE_URL}/products`, {
      method: 'POST',
      headers: {
        'Content-Type': 'application/json',
      },
      body: JSON.stringify({ ...product }),
    });

    if (!response.ok) {
      throw new Error('Could not create the product');
    }

    const data = await response.json();
    return data;
  } catch (error) {
    console.error('Error:', error);
    throw error;
  }
};

// use it from a component
const handleSubmit = async (event) => {
  event.preventDefault();
  const validationErrors = validate();
  if (Object.keys(validationErrors).length > 0) {
    setErrors(validationErrors);
  } else {
    try {
      const newProduct = await createProduct(product);
      // const newProduct = {
      //   id: new Date().getTime(),
      //   ...product,
      // };

      props.setProducts((prevProducts) => [...prevProducts, newProduct]);
      setErrors({});
    } catch (error) {
      console.error('Failed to create product:', error);
    }
  }
};
```

How to create custom hook

- Code Example - 52 (custom hook)

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

const useFetch = (URL) => {
  const [data, setData] = useState([]);
  const [isLoading, setIsLoading] = useState(false);
  const [error, setError] = useState(null);

  const fetchUsers = async () => {
    try {
      const response = await fetch(URL);
      const result = await response.json();
      setData(result);
      setIsLoading(false);
    } catch (error) {
      setIsLoading(false);
      setError(error.message);
    }
  };

  useEffect(() => {
    setIsLoading(true);
    fetchUsers();
  }, []);

  return { data, isLoading, error };
};

export default useFetch;
```

Pagination, Searching, Sorting, Filtering

pagination

```
// pagination
const itemsPerPage = 12;
const [totalPages, setTotalPages] = useState(0);
const [currentPage, setCurrentPage] = useState(1);

// make the api request when currentPage change

const fetchData = (currentPage) => {
  setIsLoading(true);
  setError(null);
  let url = `https://dummyjson.com/products?limit=${itemsPerPage}&skip=${
    (currentPage - 1) * itemsPerPage
  }`;

  fetch(url)
    .then((res) => {
      if (!res.ok) {
        throw new Error('Data could not be fetched');
      }
      return res.json();
    })
    .then((data) => {
      setProducts(data.products);
      console.log(data.products);
      console.log(currentPage);
      setTotalPages(Math.ceil(data.total / itemsPerPage));
    })
    .catch((error) => setError(error.message))
    .finally(() => setIsLoading(false));
};
useEffect(() => {
  fetchData(currentPage);
}, [currentPage]);

<Pagination
  totalPages={totalPages}
  currentPage={currentPage}
  onHandleCurrentPage={handleCurrentPage}
/>;

import React from 'react';
const Pagination = ({ totalPages, currentPage, onHandleCurrentPage }) => {
  return (
    <div className="pagination">
      {Array.from({ length: totalPages }, (_, index) => {
        return (
          <button
            key={index}
            onClick={() => onHandleCurrentPage(index)}
            className={currentPage === index + 1 ? 'active' : ''}
          >
            {index + 1}
          </button>
        );
      })}
    </div>
  );
```

```
};

export default Pagination;
```

- add previous, next, first, last option

```
import React from 'react';
import PropTypes from 'prop-types';

const Pagination = ({ totalPages, currentPage, onHandleCurrentPage }) => {
  const handleFirstPage = () => {
    onHandleCurrentPage(1);
  };
  const handleLastPage = () => {
    onHandleCurrentPage(totalPages);
  };
  const handlePreviousChange = () => {
    if (currentPage > 1) {
      onHandleCurrentPage(currentPage - 1);
    }
  };
  const handleNextChange = () => {
    if (currentPage < totalPages) {
      onHandleCurrentPage(currentPage + 1);
    }
  };

  return (
    <div className="pagination">
      <button
        onClick={handleFirstPage}
        disabled={currentPage === 1}
        aria-label="First Page"
      >
        &laquo;&laquo;
      </button>
      <button
        onClick={handlePreviousChange}
        disabled={currentPage === 1}
        aria-label="Previous Page"
      >
        &laquo;
      </button>
      <div className="pagination__pages">
        {Array.from({ length: totalPages }, (_, index) => (
          <button
            key={index}
            onClick={() => onHandleCurrentPage(index + 1)}
            className={currentPage === index + 1 ? 'active' : ''}
          >
            {index + 1}
          </button>
        ))}
      </div>
      <button
        onClick={handleNextChange}
        disabled={currentPage === totalPages}
        aria-label="Next Page"
      >
        &raquo;
      </button>
      <button
        onClick={handleLastPage}
        disabled={currentPage === totalPages}
        aria-label="Last Page"
      >
        &raquo;&raquo;
      </button>
    </div>
  );
};

Pagination.propTypes = {
  totalPages: PropTypes.number.isRequired,
  currentPage: PropTypes.number.isRequired,
  onHandleCurrentPage: PropTypes.func.isRequired,
};

export default Pagination;
```

- Not showing all page numbers at once, implement a more sophisticated pagination control that displays only a few page numbers at a time, with options to navigate to the first, previous, next, and last pages.

```
import React from 'react';

const Pagination = ({ totalPages, currentPage, onHandleCurrentPage }) => {
  const handleFirstPage = () => {
    onHandleCurrentPage(1);
  };
  const handleLastPage = () => {
    onHandleCurrentPage(totalPages);
```

```
  };
  const handlePreviousChange = () => {
    if (currentPage > 1) {
      onHandleCurrentPage(currentPage - 1);
    }
  };
  const handleNextChange = () => {
    if (currentPage < totalPages) {
      onHandleCurrentPage(currentPage + 1);
    }
  };

  const getVisiblePageNumbers = () => {
    const visiblePages = 5;
    const pages = [];

    let startPage = Math.max(1, currentPage - Math.floor(visiblePages / 2));
    let endPage = Math.min(totalPages, startPage + visiblePages - 1);

    if (endPage - startPage < visiblePages - 1) {
      startPage = Math.max(1, endPage - visiblePages + 1);
    }

    for (let i = startPage; i <= endPage; i++) {
      pages.push(i);
    }

    return pages;
  };

  const visilePageNumbers = getVisiblePageNumbers();

  return (
    <div className="pagination">
      <button
        onClick={handleFirstPage}
        disabled={currentPage === 1}
        aria-label="First Page"
      >
        &laquo;&laquo;
      </button>
      <button
        onClick={handlePreviousChange}
        disabled={currentPage === 1}
        aria-label="Previos page"
      >
        &laquo;
      </button>
      {visilePageNumbers.map((pageNumber) => {
        return (
          <button
            key={pageNumber}
            onClick={() => onHandleCurrentPage(pageNumber)}
            className={currentPage === pageNumber ? 'active' : ''}
          >
            {pageNumber}
          </button>
        );
      })}
      <button
        onClick={handleNextChange}
        disabled={currentPage === totalPages}
        aria-label="Next Page"
      >
        &raquo;
      </button>
      <button
        onClick={handleLastPage}
        disabled={currentPage === totalPages}
        aria-label="Last Page"
      >
        &raquo; &raquo;
      </button>
    </div>
  );
};

export default Pagination;
```

```
/* pagination starts here  */
.pagination {
  display: flex;
  justify-content: center;
  margin: 1.5rem 0;
  gap: 5px;
  flex-wrap: wrap;
}
.pagination button {
  padding: 10px 15px;
  margin: 0 2px;
  border: 1px solid #ccc;
  border-radius: 5px;
  background-color: #fff;
```

```
  color: #333;
  cursor: pointer;
  transition: background-color 0.3s;
}

.pagination button.active,
.pagination button.hover {
  background-color: #4caf50;
  color: white;
  border: none;
}

.pagination button[disabled] {
  cursor: not-allowed;
  opacity: 0.5;
}
/* pagination ends here  */
```

searching

- Method 1: Search in the same page

```
// Method 1: search in the same page
// step 1. Search State: Added searchTerm state to store the search input value.
// step 2. Search Input: Added an input field for searching products.
// step 3. Filter Products: Filtered the products based on the search term.
// step 4. Display Filtered Products: Display the filtered products in the UI.

// step 1. in the main component
const [searchTerm, setSearchTerm] = useState('');

const handleSearchChange = (event) => {
  const { value } = event.target;
  setSearchTerm(value);
};

// step 2: Search Input
import React from 'react';

const Search = ({ searchTerm, onHandleSearchChange }) => {
  return (
    <div className="search">
      <input
        type="text"
        placeholder="Search products..."
        value={searchTerm}
        onChange={onHandleSearchChange}
      />
    </div>
  );
};

export default Search;

// Step 3: filter products in the same page
// search in the same page
const filterProducts = products.filter((product) =>
  product.title.toLowerCase().includes(searchTerm.toLowerCase())
);

// Step 4: Now display the filtered products
```

- Method 2: Search in the entire db

```
// step 1: Update the fetchData function to accept a search query.
// step 2: Call the API endpoint for searching when the search term changes.
// step 3: Update the state with the search results.

const [searchTerm, setSearchTerm] = useState('');

// step 1: inside useEffect
const fetchData = (currentPage, searchQuery = '') => {
  setIsLoading(true);
  setError(null);
  let url = `https://dummyjson.com/products?limit=${itemsPerPage}&skip=${
    (currentPage - 1) * itemsPerPage
  }`;

  if (searchQuery) {
    url = `https://dummyjson.com/products/search?q=${searchQuery}&limit=${itemsPerPage}&skip=${
      (currentPage - 1) * itemsPerPage
    }`;
  }

  fetch(url)
    .then((res) => {
      if (!res.ok) {
        throw new Error('Data could not be fetched');
      }
      return res.json();
    })
```

```
    .then((data) => {
      setProducts(data.products);
      setTotalPages(Math.ceil(data.total / itemsPerPage));
    })
    .catch((error) => setError(error.message))
    .finally(() => setIsLoading(false));
};

useEffect(() => {
  fetchData(currentPage, searchTerm);
}, [currentPage, searchTerm]);

const handleSearchChange = (event) => {
  const { value } = event.target;
  setSearchTerm(value);
  setCurrentPage(1); // Reset to first page on new search
};
```

- sorting

```
import React from 'react';

const Sort = ({ sortCriteria, onHandleSortChange }) => {
  return (
    <div className="sort">
      <label htmlFor="sort">Sort By: </label>
      <select
        id="sort"
        value={sortCriteria}
        onChange={onHandleSortChange}
        className="sort-select"
      >
        <option value="">Sort By</option>
        <option value="title-asc">Tilte: A to Z</option>
        <option value="title-desc">Tilte: Z to A</option>
        <option value="price-asc">Price: Low to High</option>
        <option value="price-desc">Price: High to Low</option>
        <option value="rating-asc">Rating: Low to High</option>
        <option value="rating-desc">Rating: High to Low</option>
      </select>
    </div>
  );
};

export default Sort;

// In another component
const [sortCriteria, setSortCriteria] = useState('');
const fetchData = (currentPage, searchTerm, sortCriteria) => {
  setIsLoading(true);
  setError(null);
  let url = `https://dummyjson.com/products?limit=${itemsPerPage}&skip=${
    (currentPage - 1) * itemsPerPage
  }`;
  if (searchTerm !== '') {
    url = `https://dummyjson.com/products/search?q=${searchTerm}&limit=${itemsPerPage}&skip=${
      (currentPage - 1) * itemsPerPage
    }`;
  }
  if (sortCriteria) {
    // title-asc
    const spiltSortCriteria = sortCriteria.split('-');
    console.log(spiltSortCriteria);
    url += `&sortBy=${spiltSortCriteria[0]}&order=${spiltSortCriteria[1]}`;
  }
  fetch(url)
    .then((res) => {
      if (!res.ok) {
        throw new Error('Data could not be fetched');
      }
      return res.json();
    })
    .then((data) => {
      setProducts(data.products);
      console.log(data.products);
      console.log(currentPage);
      setTotalPages(Math.ceil(data.total / itemsPerPage));
    })
    .catch((error) => setError(error.message))
    .finally(() => setIsLoading(false));
};
useEffect(() => {
  fetchData(currentPage, searchTerm, sortCriteria);
}, [currentPage, searchTerm, sortCriteria]);

const handleSortChange = (event) => {
  setSortCriteria(event.target.value);
};

<Sort sortCriteria={sortCriteria} onHandleSortChange={handleSortChange} />;
```

- add styling for sorting and searching

```css
/* search and sort starts here  */
.actions {
  display: flex;
  justify-content: space-evenly;
  align-items: center;
}
.search input {
  margin-bottom: 1.2rem;
  padding: 0.5rem;
  border: 0.1rem solid #ccc;
  border-radius: 0.5rem;
}
.sort {
  margin-bottom: 1.2rem;
  display: flex;
  justify-content: center;
  align-items: center;
}

.sort-select {
  margin-left: 0.6rem;
  padding: 0.5rem;
  border: 0.1rem solid #ccc;
  border-radius: 0.5rem;
}
/* search and sort ends here  */
```

Assignment 4 - fetch products

2.3 useReducer hook

- useState and useReducers helps us to manage states
- useReducer is a good choice if you have multiple & complex states (objects, arrays)
- useReducer is powerful when managing complex logic for updating the states
- useState is better if you are using state for simple purpose and handling string, boolean or number type.
- **Code Example - 54 (without useReducer)**

```jsx
// without useReducer
import React, { useState } from 'react';

// books, modalText, isModalOpen
// add book - modalText
// remove book - modalText
const dummyBooks = [
  { id: 1, title: 'book1' },
  { id: 2, title: 'book2' },
];
const Modal = ({ modalText }) => {
  return <p>{modalText}</p>;
};
const App = () => {
  // every time update 3 relevant states
  const [books, setBooks] = useState(dummyBooks);
  const [modalText, setModalText] = useState('');
  const [isModalOpen, setIsModalOpen] = useState(false);

  const [bookTitle, setBookTitle] = useState('');

  const handleAddBook = (event) => {
    event.stopPropagation();
    setBookTitle(event.target.value);
  };
  const handleDeleteBook = (event, id) => {
    event.stopPropagation();
    const filterBooks = books.filter((book) => book.id !== id);
    setBooks(filterBooks);
    setIsModalOpen(true);
    setModalText(' book is deleted');
  };

  const handleSubmit = (event) => {
    event.preventDefault();
    const newBook = { id: new Date().getTime().toString(), title: bookTitle };
    setBooks((prevBooks) => {
      return [...prevBooks, newBook];
    });
    setIsModalOpen(true);
    setModalText('New book is added');
  };

  return (
    <div>
      <form onSubmit={handleSubmit}>
        <input
          type="text"
          placeholder="enter book title"
          value={bookTitle}
```

```
          onChange={handleAddBook}
          required
        />
        <button type="submit">Add Book</button>
      </form>

      {isModalOpen && <Modal modalText={modalText} />}

      <section className="books">
        {books.map((book) => {
          const { id, title } = book;
          return (
            <article key={id} className="book">
              <h2>id: {id}</h2>
              <p>title: {title}</p>
              <button
                onClick={(event) => {
                  handleDeleteBook(event, id);
                }}
              >
                Delete
              </button>
            </article>
          );
        })}
      </section>
    </div>
  );
};

export default App;
```

- Code Example - 55 (with useReducer)

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

// books, modalText, isModalOpen
// add book - modalText
// remove book - modalText
const dummyBooks = [
  { id: 1, title: 'book1' },
  { id: 2, title: 'book2' },
];
const Modal = ({ modalText }) => {
  return <p>{modalText}</p>;
};

// based on action type reducer will update the state & return the state
const reducer = (state, action) => {
  // action object has action.type and action.payload
  switch (action.type) {
    case 'ADD':
      const allBooks = [...state.books, action.payload];
      return {
        ...state,
        books: allBooks,
        isModalOpen: true,
        modalText: 'new book is added',
      };
    case 'DELETE':
      const filteredBooks = state.books.filter(
        (book) => book.id !== action.payload
      );
      return {
        ...state,
        books: filteredBooks,
        isModalOpen: true,
        modalText: 'book is deleted',
      };

    default:
      return state;
  }
};

const initialState = {
  books: dummyBooks,
  isModalOpen: false,
  modalText: '',
};

const App = () => {
  // const [books, setBooks] = useState(dummyBooks);
  // const [modalText, setModalText] = useState('');
  // const [isModalOpen, setIsModalOpen] = useState(false);

  const [bookState, dispatch] = useReducer(reducer, initialState);

  const [bookTitle, setBookTitle] = useState('');

  const handleTitleChange = (event) => {
    event.stopPropagation();
    setBookTitle(event.target.value);
```

```
  };
  const handleDeleteBook = (event, id) => {
    event.stopPropagation();
    dispatch({ type: 'DELETE', payload: id });
  };

  const handleSubmit = (event) => {
    event.preventDefault();
    const newBook = { id: new Date().getTime().toString(), title: bookTitle };
    dispatch({ type: 'ADD', payload: newBook });
    setBookTitle('');
  };

  return (
    <div>
      <form onSubmit={handleSubmit}>
        <input
          type="text"
          placeholder="enter book title"
          value={bookTitle}
          onChange={handleTitleChange}
          required
        />
        <button type="submit">Add Book</button>
      </form>

      {bookState.isModalOpen && <Modal modalText={bookState.modalText} />}

      <section className="books">
        {bookState.books.map((book) => {
          const { id, title } = book;
          return (
            <article key={id} className="book">
              <h2>id: {id}</h2>
              <p>title: {title}</p>
              <button
                onClick={(event) => {
                  handleDeleteBook(event, id);
                }}
              >
                Delete
              </button>
            </article>
          );
        })}
      </section>
    </div>
  );
};

export default App;
```

2.4 Routing

- A github repo for routing

What is Routing?

- Navigating from one route to another

Basic Routing setup

- Learn from react-router official side
- install the package `npm install -D react-router-dom`, if you are using react-router 5 `npm i -D react-router-dom@latest`
- create few pages inside pages folder: Home, Contact, About, Products.
- **Code Example - 56 (basic routing)**

```
// create few pages -> Home.js, Products.js, Contact.js, NotFound.js
const Home = () => {
  return (
    <div>
      <h1>home page</h1>
      <p>Welcome to home page</p>
    </div>
  );
};

export default Home;


const Contact = () => {
  return (
    <div>
      <h1>Contact page</h1>
      <p>Welcome to Contact Page</p>
    </div>
  );
};

export default Contact;
```

```
const Products = () => {
  return (
    <div>
      <h2>Products page</h2>
      <p>all the products here</p>
    </div>
  );
};

export default Products;


// App.tsx
import Home from './pages/Home';
import Contact from './pages/Contact';
import NotFound from './pages/NotFound';

import { createBrowserRouter, RouterProvider } from 'react-router-dom';

const router = createBrowserRouter([
  {
    path: '/',
    element: <Home />,
  },
  {
    path: '/contact',
    element: <Contact />,
  },
   {
    path: '/products',
    element: <Products />,
  }
]);

const App = () => {
  return <RouterProvider router={router} />;
};

export default App;
```

Handle Not Found Errors with useRouteError()

- create an Error Page

```
import React from 'react'

import { useRouteError } from 'react-router-dom';

export default function ErrorPage() {
  const error = useRouteError();
  console.error(error);

  return (
    <div id="error-page">
      <h1>Oops!</h1>
      <p>Sorry, an unexpected error has occurred.</p>
      <p>
        <i>{error.statusText || error.message}</i>
      </p>
    </div>
  );
}

// App.jsx
import React from 'react';
import { createBrowserRouter, RouterProvider } from 'react-router-dom';

import Home from './pages/Home';
import About from './pages/About';
import Contact from './pages/Contact';
import Navbar from './layout/Navbar';
import ErrorPage from './pages/NotFound';

const App = () => {
  const router = createBrowserRouter([
    {
      path: '/',
      element: <Navbar />,
      errorElement: <ErrorPage />,
      children: [
        {
          path: '/',
          element: <Home />,
        },
        {
          path: '/contact',
          element: <Contact />,
        },
        {
          path: '/about',
          element: <About />,
        },
      ],
```

```
    },
  ]);

  return <RouterProvider router={router} />;
};

export default App;
```

Child Route or nested route with `<Outlet />`

```
// layout/Navbar.jsx
import React from 'react';
import { Outlet } from 'react-router-dom';

const Navbar = () => {
  return (
    <>
      <nav>
        <ul>
          <li>
            <a href="/">Home</a>
          </li>
          <li>
            <a href="/about">About</a>
          </li>
          <li>
            <a href="/contact">Contact</a>
          </li>
        </ul>
      </nav>
      <Outlet />
    </>
  );
};

export default Navbar;

// App.jsx
import React from 'react';
import { createBrowserRouter, RouterProvider } from 'react-router-dom';

import Home from './pages/Home';
import About from './pages/About';
import Contact from './pages/Contact';
import Navbar from './layout/Navbar';

const App = () => {
  const router = createBrowserRouter([
    {
      path: '/',
      element: <Navbar />,
      children: [
        {
          path: '/',
          element: <Home />,
        },
        {
          path: '/contact',
          element: <Contact />,
        },
        {
          path: '/about',
          element: <About />,
        }
      ],
    },
  ]);

  return <RouterProvider router={router} />;
};

export default App;
```

Link Component

- stop the auto refresh

```
import React from 'react';
import { Link, Outlet } from 'react-router-dom';

const Navbar = () => {
  return (
    <>
      <nav>
        <ul>
          <li>
            <Link to="/">Home</Link>
          </li>
          <li>
            <Link to="/about">About</Link>
          </li>
```

```
          <li>
            <Link to="/contact">Contact</Link>
          </li>
        </ul>
      </nav>
      <Outlet />
    </>
  );
};

export default Navbar;
```

Programmatically routing with useNavigate()

```
import React from 'react';
import { useNavigate } from 'react-router-dom';

const Contact = () => {
  const navigate = useNavigate();
  return (
    <div>
      <h2>Contact Page</h2>
      <button onClick={() => navigate('/')}>Go To Home</button>
    </div>
  );
};

export default Contact;
```

Pass data with useNavigate() and receive the data with useLocation()

- state and useLocation

```
// pass data when routing:  navigate('/profile', { state: userData });
//@ts-nocheck
import React, { useState } from 'react';
import { useNavigate } from 'react-router-dom';

const SignIn = () => {
  const navigate = useNavigate();
  const [user, setUser] = useState({
    email: '',
    password: '',
  });

  const handleChange = (event) => {
    const { name, value } = event.target;
    setUser((prevUser) => {
      return { ...prevUser, [name]: value };
    });
  };

  const handleSubmit = (event) => {
    event.preventDefault();

    // user.email
    // user.password

    // make a request to backend api /api/users/login
    const userData = {
      id: Date.now().toString(),
      name: 'Anisul Islam',
      email: 'anisul2010s@yahoo.co.uk',
      password: '123456',
      address: 'sylhet, Bangladesh',
    };

    if (user.email === userData.email && user.password === userData.password) {
      console.log('successfully signed in');
      navigate('/profile', { state: userData });
    } else {
      navigate('/signin');
    }
  };
  return (
    <div>
      <h2>User Sign In</h2>
      <form onSubmit={handleSubmit}>
        <div>
          <label htmlFor="email">Email: </label>
          <input
            type="email"
            id="email"
            name="email"
            value={user.email}
            onChange={handleChange}
          />
        </div>
        <br />
        <div>
          <label htmlFor="password">Password: </label>
```

```
          <input
            type="password"
            id="password"
            name="password"
            value={user.password}
            onChange={handleChange}
          />
        </div>
        <br />

        <button type="submit">Signin</button>
      </form>
    </div>
  );
};

export default SignIn;


// receieve the data
// const location = useLocation();
// const {state} = useLocation();
// console.log(location);

// {state ? do something: do something else}
import React from 'react';
import { useLocation } from 'react-router-dom';

const Profile = () => {
  const { state } = useLocation();
  console.log(state);
  return (
    <div>
      <h2>Profile Page</h2>
      <h3>Name: {state.name}</h3>
      <h3>Email: {state.email}</h3>
      <h3>address: {state.address}</h3>
    </div>
  );
};

export default Profile;
```

Dynamic routing with useParams()

- based on the parameters show dynamic data in a page
  - step 1: setup the dynamic parameter in the createBrowserRouter such as `/products/:id` or `categories/:id` in route
  - step 2: pass the params when routing such as `<Link to={ /products/${product.id} }>Show details</Link>`
  - step 3: use the params to load the data for specific item `const { id } = useParams();`

```
// step 1: set up the router
import React from 'react';
import { createBrowserRouter, RouterProvider } from 'react-router-dom';

import Home from './pages/Home';
import About from './pages/About';
import Contact from './pages/Contact';
import ErrorPage from './pages/ErrorPage';
import Navbar from './layout/Navbar';
import SignIn from './pages/SignIn';
import Profile from './pages/Profile';
import ProductDetails from './pages/ProductDetails';

const App = () => {
  const router = createBrowserRouter([
    {
      path: '/',
      element: <Navbar />,
      errorElement: <ErrorPage />,
      children: [
        {
          path: '/',
          element: <Home />,
        },
        {
          path: '/about',
          element: <About />,
        },
        {
          path: '/contact',
          element: <Contact />,
        },
        {
          path: '/signin',
          element: <SignIn />,
        },
        {
          path: '/profile',
          element: <Profile />,
        },
        {
          path: '/products/:id',
```

```
          element: <ProductDetails />,
        },
      ],
    },
  ]);

  return (
    <>
      <RouterProvider router={router} />
    </>
  );
};

export default App;

// product/1   => details of product 1 => ProductDetails1.jsx
// product/2   => details of product 2 => ProductDetails2.jsx
// product/3   => details of product 2 => ProductDetails3.jsx
// product/4   => details of product 2 => ProductDetails4.jsx

// product/1   => details of product 1 => ProductDetails.jsx
// product/2   => details of product 2 => ProductDetails.jsx
// product/3   => details of product 3 => ProductDetails.jsx
// product/4   => details of product 4 => ProductDetails.jsx


// Load some data in a component to make things interesting
import React, { useEffect, useState } from 'react';
import Products from '../components/Products';

const Home = () => {
  const [products, setProducts] = useState([]);

  useEffect(() => {
    fetch('https://fakestoreapi.com/products')
      .then((res) => res.json())
      .then((json) => setProducts(json));
  }, []);

  return (
    <div>
      <Products products={products} />
    </div>
  );
};

export default Home;

// step 2: pass the params when routing
//@ts-nocheck
import React from 'react';
import { Link } from 'react-router-dom';

const Products = ({ products }) => {
  return (
    <div className="products">
      {products.map((product) => {
        return (
          <div key={product.id}>
            <img src={product.image} alt={product.title} />
            <h2>{product.title}</h2>
            <p>price: {product.price}</p>
            <p>category: {product.category}</p>
            <Link to={`/products/${product.id}`}>Show details</Link>
          </div>
        );
      })}
    </div>
  );
};

export default Products;

// step 3: use the params to fetch an item
//@ts-nocheck
import React, { useEffect, useState } from 'react';
import { useParams } from 'react-router-dom';

const ProductDetails = () => {
  const { id } = useParams();
  const [product, setProduct] = useState({});

  useEffect(() => {
    fetch(`https://fakestoreapi.com/products/${id}`)
      .then((res) => res.json())
      .then((json) => setProduct(json));
  }, []);

  if (!product) {
    return <h2>No data for the product</h2>;
  }

  const { image, title, description, price, rating } = product;
```

```
  return (
    <div>
      <h2>Product Details Page</h2>
      <img src={image} alt={title} />
      <h3>{title}</h3>
      <p>{description}</p>
      <p>price: {price}</p>
      <p>rating: {rating && rating.rate}/5</p>
    </div>
  );
};

export default ProductDetails;
```

Route parameter with useParams(), Query parameter with useSearchParams()

- `/users?id=101&age=23`

```
import * as React from 'react';
import { useSearchParams } from 'react-router-dom';

function App() {
  let [searchParams, setSearchParams] = useSearchParams();

  function handleSubmit(event) {
    event.preventDefault();
    // The serialize function here would be responsible for
    // creating an object of { key: value } pairs from the
    // fields in the form that make up the query.
    let params = serializeFormQuery(event.target);
    setSearchParams(params);
  }

  return (
    <div>
      <form onSubmit={handleSubmit}>{/* ... */}</form>
      <h2> {searchParams.get('id')} </h2>
      <h2> {searchParams.get('age')} </h2>
    </div>
  );
}
```

Protected Routing

- layout planning for the dashboard
  - first create few 2 sidebars `UserSidebar.jsx` and `AdminSidebar.jsx`
  - then create few 2 components `UserDashboard.jsx` and `AdminDashboard.jsx`
- Why do you need route protection?
  - `/dashboard/users/profile` => IsSignedIn => UserProfile Component
  - `/dashboard/users/orders` => IsSignedIn => UserOrders Component
  - `/dashboard/admin/profile` => IsSignedIn and IsAdmin => AdminProfile Component
  - `/dashboard/admin/products` => IsSignedIn and IsAdmin => AdminProducts Component
  - `/dashboard/admin/categories` => IsSignedIn and IsAdmin => AdminCategories Component
  - `/dashboard/admin/orders` => IsSignedIn and IsAdmin => AdminOrders Component
- Protect Route based on login status

```
// routes/Protected.js
import React from 'react';
import { Outlet } from 'react-router-dom';
import SignIn from '../pages/SignIn';

const PortectedRoute = () => {
  // api call
  // redux-store ->user login or not?
  const isSignedIn = true;
  return isSignedIn ? <Outlet /> : <SignIn />;
};

export default PortectedRoute;

// index.js - routing
const router = createBrowserRouter([
  {
    path: '/',
    element: <Header />,
    errorElement: <NotFound />,
    children: [
      {
        path: '/',
        element: <Home />,
      },
      {
        path: '/signin',
        element: <SignIn />,
```

```
      },
      {
        path: '/dashboard/users',
        element: <PortectedRoute />,
        children: [
          {
            path: 'profile',
            element: <UserProfile />,
          },
          {
            path: 'orders',
            element: <UserOrders />,
          },
        ],
      },
    ],
  },
]);

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    <RouterProvider router={router} />
  </React.StrictMode>
);
```

- step 3: Protect route based on Admin status

```
// create the AdminRoute component

import React from 'react';
import { Outlet } from 'react-router-dom';
import SignIn from '../pages/SignIn';

const AdminRoute = () => {
  // api call
  // redux-store ->user login or not?
  const isSignedIn = true;
  const isAdmin = true;
  return isSignedIn && isAdmin ? <Outlet /> : <SignIn />;
};

export default PortectedRoute;

// now protect the routes
// index.js - routing
const Routes = () => {
  const router = createBrowserRouter([
    {
      path: '/',
      element: <Layout />,
      children: [
        {
          path: '/',
          element: <Home />,
        },
        {
          path: '/signup',
          element: <SignUp />,
        },
        {
          path: '/signin',
          element: <SignIn />,
        },
        {
          path: '/cart',
          element: <Cart />,
        },
        {
          path: '/about',
          element: <About />,
        },
        {
          path: '/products/:id',
          element: <ProductDetails />,
        },
        {
          path: '/dashboard/user',
          element: <PortectedRoute />,
          children: [
            {
              path: '',
              element: <UserDashboard />,
              children: [
                {
                  index: true, // This sets the default child route
                  element: <UserManageProfile />, // The component to display by default
                },
                {
                  path: 'profile',
                  element: <UserManageProfile />,
                },
                {
                  path: 'orders',
```

```
                element: <UserManageOrder />,
              },
            ],
          },
        ],
      },
      {
        path: '/dashboard/admin',
        element: <AdminRoute />,
        children: [
          {
            path: '',
            element: <AdminDashboard />, // The parent dashboard element
            children: [
              {
                index: true, // This sets the default child route
                element: <AdminManageUsers />, // The component to display by default
              },
              {
                path: 'users',
                element: <AdminManageUsers />,
              },
              {
                path: 'products',
                element: <AdminMangeProducts />,
              },
              {
                path: 'categories',
                element: <AdminManageCategories />,
              },
              {
                path: 'orders',
                element: <AdminManageOrders />,
              },
            ],
          },
        ],
      },
    ],
  },
]);

  return <RouterProvider router={router} />;
};

export default Routes;
```

[handle navbar programatically]

```
// when you sign in set the data in localstorage

// use the local storage in the Navbar and Protect Route as well
```

2.5 CRUD Operations - http methods - user management app

- running a json server in react -> `npm i json-server && npx json-server -p 3001 -w database/db.json`

Read Users

Delete User

Create User

Update User

[2.6 Optimization: React.memo(), useCallback(), useMemo()]

react memo

- components re-render when state or props changes
- A good reference: https://dmitripavlutin.com/use-react-memo-wisely/
- It helps to avoid unnecessary components rendering

```
// App.js
import React, { useState } from 'react';
 import Message from './components/Message';

 const App = () => {
   const [count, setCount] = useState(0);
   console.log('app rendering');
   return (
     <div>
       <h1>Welcome to Memo</h1>
       <h2>Count : {count}</h2>
       <button
         onClick={() => {
           setCount((count) => count + 1);
```

```
            }}>
            Increment
          </button>
          <Message numberOfMessages={0} />
        </div>
      );
    };

    export default App;

// Message.js
import React, { memo } from 'react';
import PropTypes from 'prop-types';
const Message = (props) => {
  console.log('message rendering');
  return <div>Message {props.numberOfMessages}</div>;
};

Message.propTypes = {
  numberOfMessages: PropTypes.number
};

export default memo(Message);
```

useCallback Hook

- It helps to avoid unnecessary components rendering for defining callback methods
- only component will be rendered when some states or props change
- callback function definition re-rendering the componenet unnecessarily

```
   // App.js
   import React, { useState, useCallback, useMemo } from 'react';
    import Message from './components/Message';

    const App = () => {
      const [count, setCount] = useState(0);
      console.log('app component rendering');

      const handleDataFromMessage = useCallback((data) => {
        console.log(data);
      }, []);

      return (
        <div>
          <h2>{numbers}</h2>
          <h2>Count : {count}</h2>
          <button
            onClick={() => {
              setCount((count) => count + 1);
            }}>
            Increment
          </button>
          <Message onHandleDataFromMessage={handleDataFromMessage} />
        </div>
      );
    };

    export default App;


// Message.js
import React from 'react';
import PropTypes from 'prop-types';
const Message = ({ onHandleDataFromMessage }) => {
  console.log('message component rendering');
  onHandleDataFromMessage('hello I am from message component');
  return <div>Message</div>;
};

Message.propTypes = {
  onHandleDataFromMessage: PropTypes.func
};

export default React.memo(Message);
```

useMemo Hook

- It helps to avoid taking unnecessary time for same kind of complex calculation for each rendering

```
   // App.js
   import React, { useState, useCallback, useMemo } from 'react';
    import Message from './components/Message';

    const App = () => {
      const [count, setCount] = useState(0);
      console.log('app component rendering');

      const numbers = useMemo(() => {
        let number = 0;
```

```
          for (let index = 0; index < 5000000000; index++) {
            number++;
          }
          return number;
        }, []);

        return (
          <div>
            <h2>{numbers}</h2>
            <h2>Count : {count}</h2>
            <button
              onClick={() => {
                setCount((count) => count + 1);
              }}>
              Increment
            </button>
          </div>
        );
      };

      export default App;


    // Message.js
    import React from 'react';
    import PropTypes from 'prop-types';
    const Message = ({ onHandleDataFromMessage }) => {
      console.log('message component rendering');
      onHandleDataFromMessage('hello I am from message component');
      return <div>Message</div>;
    };

    Message.propTypes = {
      onHandleDataFromMessage: PropTypes.func
    };

    export default React.memo(Message);
```

[2.7 props drilling, useContext Hook]

Props drilling

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

import Component1 from "./components/Component1";

const App = () => {
  const [user, setUser] = useState({ id: 1, name: "anisul islam" });
  return (
    <div>
      <Component1 user={user} />
    </div>
  );
};

export default App;

import React from 'react';
import Component2 from './Component2';

const Component1 = ({ user }) => {
    return (
        <div>
            <Component2 user={user} />
        </div>
    );
};

export default Component1;

import React from 'react';
import Component3 from './Component3';

const Component2 = ({ user }) => {
    return (
        <div>
            <Component3 user={user} />
        </div>
    );
};

export default Component2;

import React from 'react';
import Component4 from './Component4';

const Component3 = ({ user }) => {
    return (
        <div>
            <Component4 user={user} />
        </div>
    );
```

```
};

export default Component3;

import React from 'react';

const Component4 = ({ user }) => {
    console.log(user);
    return (
        <div>
            <h2>Component 4</h2>
            <h3>{user.id}</h3>
            <p>{user.name}</p>
        </div>
    );
};

export default Component4;
```

useContext Hook

The `useContext` hook in React is used to share state or functions between components without needing to pass props manually at every level. It allows for easier state management across different components, making the code more readable and maintainable when the same data is needed by multiple components.

- it helps us to create component level, app level or global states.
- It also helps us to avoid state lifting.
- steps to use the context
  - step 1: create the context
  - step 2: provide the context
  - step 3: use the context

Common Use Cases for `useContext`

1. **Global State Management**: Instead of passing props through every component in the tree, you can use `useContext` to share state globally across different parts of your app. This is useful for authentication, user preferences, or theme settings.
2. **Theming**: Share light/dark mode across components.
3. **Authentication**: Manage user login/logout globally.
4. **Language/Localization**: Manage selected language for content.
5. **Configuration/Settings**: Share app-wide configuration values (e.g., API URLs, app names).
6. **Shared Modals or Notifications**: Trigger modals or notifications from anywhere in the app.
7. **User Preferences**: Manage global user settings like currency or date format.

Example 1: Basic example

- step 1: create a context

```
import React from 'react';

// we can pass any value or object in createContext()
export const UserContext = React.createContext(); // it allows us to use Provider and consumer (we will use useContext instead
```

- step 2: provide the context - wrap the parent with the context

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

import Component1 from './components/Component1';
import { UserContext } from './UserContext';

const App = () => {
  const [user, setUser] = useState({ id: 1, name: 'anisul islam' });
  const text = 'hello everyone!';
  return (
    <div>
      <UserContext.Provider value={{ user, text }}>
        <Component1 />
      </UserContext.Provider>
    </div>
  );
};

export default App;
```

- step 3: access the context with useContext

```
import React, { useContext } from 'react';
import { UserContext } from '../UserContext';

const Component4 = () => {
  const { user } = useContext(UserContext);

  return (
    <div>
```

```
      <h2>Component 4</h2>
      <h3>{user.id}</h3>
      <p>{user.name}</p>
    </div>
  );
};

export default Component4;
```

Example 2: Basic User App

```
// context/UserContext.js
import { createContext } from 'react';
export const UserContext = createContext({});

// App.js
import React, { useState } from "react";
import NewUser from "./components/NewUser";

import Users from "./components/Users";
import { UserContext } from "./context/UserContext";

const App = () => {
  const [users, setUsers] = useState([{ id: 1, name: "anisul islam" }]);

  return (
    <div>
      <UserContext.Provider value={{ users, setUsers }}>
        <NewUser />
        <Users />
      </UserContext.Provider>
    </div>
  );
};

export default App;

// adding useMemo and modify
import React, { useState, useMemo } from 'react';
import NewUser from './components/NewUser';

import Users from './components/Users';
import { UserContext } from './context/UserContext';

const App = () => {
    const [users, setUsers] = useState([{ id: 1, name: 'anisul islam' }]);

    const providerValue = useMemo(() => ({ users, setUsers }), [users, setUsers]);

    return (
        <div>
            <UserContext.Provider value={providerValue}>
                <NewUser />
                <Users />
            </UserContext.Provider>
        </div>
    );
};

export default App;


// Users.js
import React, { useContext } from 'react';
import { UserContext } from '../context/UserContext';

import User from './User';

const Users = () => {
    const { users } = useContext(UserContext);
    return (
        <section>
            <h2>Users Management</h2>
            {users.map((user) => (
                <User key={user.id} {...user} />
            ))}
        </section>
    );
};

export default Users;

// User.js
import React from 'react';

const User = ({ ...user }) => {
    const { id, name } = user;

    return (
        <article>
            <h3>ID: {id}</h3>
            <p>Name: {name}</p>
        </article>
```

```
    );
};

export default User;

// NewUser.js
import React, { useState, useContext } from 'react';
import { UserContext } from '../context/UserContext';

const NewUser = () => {
    const [name, setName] = useState('');
    const { setUsers } = useContext(UserContext);

    const handleSubmit = (event) => {
        event.preventDefault();
        const newUser = {
            id: new Date().getTime().toString(),
            name: name
        };
        setUsers((prevUsers) => {
            return [...prevUsers, newUser];
        });
        // alert(JSON.stringify(newUser, null, 4));
        setName('');
    };

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

    return (
        <div>
            <h2>Create New User</h2>
            <form onSubmit={handleSubmit}>
                <input type="text" placeholder="Enter name here" onChange={handleNameChange} value={name} />
                <button type="submit">Add New User</button>
            </form>
        </div>
    );
};

export default NewUser;
```

Example 3: Theme change project using useContext

```
import React, { useState, useContext } from 'react';
import { ThemeContext } from './context/ThemeContext';

const App = () => {
    const [theme, setTheme] = useState('dark');
    // const themeContext = useContext(ThemeContext);
    // console.log({ themeContext });

    const toggleTheme = () => {
        setTheme(theme === 'dark' ? 'light' : 'dark');
    };
    return (
        <ThemeContext.Provider value={theme}>
            <div className={`App ${theme}`}>
                <h1>welcome</h1>
                <button onClick={toggleTheme}>Change Theme</button>
            </div>
        </ThemeContext.Provider>
    );
};

export default App;


.dark {
    background-color: #000;
    color: #fff;
}
.light {
    background-color: #fff;
    color: #000;
}
```

Example 4: Global Theme using `useContext`

Here's a simple example where a global theme (light/dark mode) is shared across components:

```
import React, { useState, createContext, useContext } from 'react';

// Create a ThemeContext
const ThemeContext = createContext();

// ThemeProvider component to provide theme value to the entire app
const ThemeProvider = ({ children }) => {
```

```
  const [theme, setTheme] = useState('light');

  const toggleTheme = () => {
    setTheme((prevTheme) => (prevTheme === 'light' ? 'dark' : 'light'));
  };

  return (
    <ThemeContext.Provider value={{ theme, toggleTheme }}>
      {children}
    </ThemeContext.Provider>
  );
};

const ThemeToggler = () => {
  // Use the theme from context
  const { theme, toggleTheme } = useContext(ThemeContext);

  return (
    <div>
      <p>Current Theme: {theme}</p>
      <button onClick={toggleTheme}>Toggle Theme</button>
    </div>
  );
};

const App = () => {
  return (
    <ThemeProvider>
      <div>
        <h1>Theme Context Example</h1>
        <ThemeToggler />
      </div>
    </ThemeProvider>
  );
};

export default App;
```

In this example:

- The `ThemeContext` is created and provided to all components in the app using the `ThemeProvider`.
- `ThemeToggler` consumes the theme using `useContext` and allows the user to toggle the theme between light and dark.

Example 5: User Authentication using `useContext`

This example demonstrates how to manage user authentication state globally using `useContext`:

```
import React, { useState, createContext, useContext } from 'react';

// Create an AuthContext
const AuthContext = createContext();

// AuthProvider component to manage auth state
const AuthProvider = ({ children }) => {
  const [isAuthenticated, setIsAuthenticated] = useState(false);

  const login = () => setIsAuthenticated(true);
  const logout = () => setIsAuthenticated(false);

  return (
    <AuthContext.Provider value={{ isAuthenticated, login, logout }}>
      {children}
    </AuthContext.Provider>
  );
};

// Component that displays login/logout buttons based on authentication status
const AuthButtons = () => {
  const { isAuthenticated, login, logout } = useContext(AuthContext);

  return (
    <div>
      {isAuthenticated ? (
        <button onClick={logout}>Logout</button>
      ) : (
        <button onClick={login}>Login</button>
      )}
    </div>
  );
};

// Another component that conditionally renders content based on auth status
const Dashboard = () => {
  const { isAuthenticated } = useContext(AuthContext);

  return (
    <div>
      {isAuthenticated ? (
        <h2>Welcome, User!</h2>
      ) : (
        <h2>Please log in to continue</h2>
```

```
      )}
    </div>
  );
};

const App = () => {
  return (
    <AuthProvider>
      <div>
        <h1>Authentication Context Example</h1>
        <AuthButtons />
        <Dashboard />
      </div>
    </AuthProvider>
  );
};

export default App;
```

In this example:

- The `AuthContext` is created to manage the authentication state globally.
- `AuthButtons` and `Dashboard` use `useContext` to access authentication state (`isAuthenticated`) and update functions (`login` , `logout`) without passing them down as props.

Example 6: Language Context using `useContext`

This is an example of using `useContext` for language/localization in an app:

```
import React, { useState, createContext, useContext } from 'react';

// Create a LanguageContext
const LanguageContext = createContext();

// LanguageProvider component
const LanguageProvider = ({ children }) => {
  const [language, setLanguage] = useState('en');

  const switchLanguage = (lang) => setLanguage(lang);

  return (
    <LanguageContext.Provider value={{ language, switchLanguage }}>
      {children}
    </LanguageContext.Provider>
  );
};

// Component to select language
const LanguageSelector = () => {
  const { language, switchLanguage } = useContext(LanguageContext);

  return (
    <div>
      <p>Current Language: {language}</p>
      <button onClick={() => switchLanguage('en')}>English</button>
      <button onClick={() => switchLanguage('es')}>Spanish</button>
    </div>
  );
};

// Component to display content in selected language
const Content = () => {
  const { language } = useContext(LanguageContext);

  return <p>{language === 'en' ? 'Hello!' : '¡Hola!'}</p>;
};

const App = () => {
  return (
    <LanguageProvider>
      <div>
        <h1>Language Context Example</h1>
        <LanguageSelector />
        <Content />
      </div>
    </LanguageProvider>
  );
};

export default App;
```

In this example:

- The `LanguageContext` stores the current language (`language`) and a method to switch the language (`switchLanguage`).
- The `LanguageSelector` component allows users to switch between languages, and the `Content` component displays content based on the selected language.

Sure! I'll provide examples for the remaining use cases where `useContext` can be applied:

- Settings/Configuration
- Shared Modals or Notifications

Example 7: Configuration/Settings Using `useContext`

This example demonstrates how to use `useContext` to manage app-wide configuration or settings like an API base URL, or any application-wide settings that need to be accessed across different components.

```
import React, { createContext, useContext } from 'react';

// Create a ConfigurationContext
const ConfigContext = createContext();

// ConfigProvider component
const ConfigProvider = ({ children }) => {
  const config = {
    apiBaseUrl: 'https://api.example.com',
    appName: 'My App',
    theme: 'dark',
  };

  return (
    <ConfigContext.Provider value={config}>{children}</ConfigContext.Provider>
  );
};

// Component that uses configuration context
const DisplayConfig = () => {
  const config = useContext(ConfigContext);

  return (
    <div>
      <h2>App Name: {config.appName}</h2>
      <p>API Base URL: {config.apiBaseUrl}</p>
      <p>Current Theme: {config.theme}</p>
    </div>
  );
};

const App = () => {
  return (
    <ConfigProvider>
      <div>
        <h1>App Configuration</h1>
        <DisplayConfig />
      </div>
    </ConfigProvider>
  );
};

export default App;
```

In this example:

- The `ConfigContext` stores application-wide configuration settings.
- The `DisplayConfig` component accesses the config using `useContext` and displays it.

This pattern is very useful when you need to share settings like API endpoints, app metadata, or feature flags across multiple components.

Example 8: Shared Modal/Notification Using `useContext`

Another great use case for `useContext` is managing modals or notifications across different parts of the application, so they can be triggered from anywhere.

- Code Example

```
import React, { useState, createContext, useContext } from 'react';

// Create a ModalContext
const ModalContext = createContext();

// ModalProvider component to manage modal state
const ModalProvider = ({ children }) => {
  const [isModalOpen, setIsModalOpen] = useState(false);

  const openModal = () => setIsModalOpen(true);
  const closeModal = () => setIsModalOpen(false);

  return (
    <ModalContext.Provider value={{ isModalOpen, openModal, closeModal }}>
      {children}
    </ModalContext.Provider>
  );
};

// Modal component
const Modal = () => {
  const { isModalOpen, closeModal } = useContext(ModalContext);
```

```
  if (!isModalOpen) return null;

  return (
    <div
      style={{
        position: 'fixed',
        top: '0',
        left: '0',
        right: '0',
        bottom: '0',
        backgroundColor: 'rgba(0, 0, 0, 0.5)',
        display: 'flex',
        justifyContent: 'center',
        alignItems: 'center',
      }}
    >
      <div
        style={{
          backgroundColor: 'white',
          padding: '20px',
          borderRadius: '8px',
        }}
      >
        <h2>Modal Title</h2>
        <p>This is a modal.</p>
        <button onClick={closeModal}>Close Modal</button>
      </div>
    </div>
  );
};

// Component to trigger modal
const TriggerModal = () => {
  const { openModal } = useContext(ModalContext);

  return <button onClick={openModal}>Open Modal</button>;
};

const App = () => {
  return (
    <ModalProvider>
      <div>
        <h1>Modal Context Example</h1>
        <TriggerModal />
        <Modal />
      </div>
    </ModalProvider>
  );
};

export default App;
```

In this example:

- The `ModalContext` provides a mechanism to open and close the modal globally.
- The `Modal` component displays the modal when `isModalOpen` is true.
- The `TriggerModal` component allows any part of the app to trigger the modal.

This pattern can also be used for notifications, toast messages, or any other component that needs to be triggered from multiple places in your app.

Example 9: Global User Settings or Preferences

You might want to save a user's preferences globally, like preferred currency, date formats, or notification preferences. `useContext` is perfect for this kind of use case.

- Code Example

```
import React, { useState, createContext, useContext } from 'react';

// Create a PreferencesContext
const PreferencesContext = createContext();

// PreferencesProvider component
const PreferencesProvider = ({ children }) => {
  const [preferences, setPreferences] = useState({
    currency: 'USD',
    dateFormat: 'MM/DD/YYYY',
  });

  const updatePreferences = (newPreferences) => {
    setPreferences((prevPreferences) => ({
      ...prevPreferences,
      ...newPreferences,
    }));
  };

  return (
    <PreferencesContext.Provider value={{ preferences, updatePreferences }}>
      {children}
```

```
    </PreferencesContext.Provider>
  );
};

// Component to update currency preference
const CurrencyPreference = () => {
  const { preferences, updatePreferences } = useContext(PreferencesContext);

  const handleCurrencyChange = (e) => {
    updatePreferences({ currency: e.target.value });
  };

  return (
    <div>
      <h3>Preferred Currency: {preferences.currency}</h3>
      <select value={preferences.currency} onChange={handleCurrencyChange}>
        <option value="USD">USD</option>
        <option value="EUR">EUR</option>
        <option value="JPY">JPY</option>
      </select>
    </div>
  );
};

// Component to update date format preference
const DateFormatPreference = () => {
  const { preferences, updatePreferences } = useContext(PreferencesContext);

  const handleDateFormatChange = (e) => {
    updatePreferences({ dateFormat: e.target.value });
  };

  return (
    <div>
      <h3>Preferred Date Format: {preferences.dateFormat}</h3>
      <select value={preferences.dateFormat} onChange={handleDateFormatChange}>
        <option value="MM/DD/YYYY">MM/DD/YYYY</option>
        <option value="DD/MM/YYYY">DD/MM/YYYY</option>
      </select>
    </div>
  );
};

const App = () => {
  return (
    <PreferencesProvider>
      <div>
        <h1>User Preferences</h1>
        <CurrencyPreference />
        <DateFormatPreference />
      </div>
    </PreferencesProvider>
  );
};

export default App;
```

In this example:

- The `PreferencesContext` holds the user's preferences and provides a method to update them.
- `CurrencyPreference` and `DateFormatPreference` components allow the user to update these settings.
- All changes are reflected globally across the app using `useContext`.

Example 10: Fetching Data with Context and Sharing Across Components

We'll use an API to fetch data and make it available throughout the application using `Context` and `useContext`. In this case, let's assume we are fetching a list of products from an API.

Step-by-Step Breakdown

1. **Create a `DataContext`**: This will hold the fetched data and the logic for fetching/updating it.
2. **Create a `DataProvider`**: This will manage the fetching logic and provide the fetched data to children components.
3. **Fetch Data Inside the Provider**: We'll use `useEffect` to fetch data once the provider mounts.
4. **Consume Data Using `useContext`**: Any child component can consume the data using `useContext`.

Step 1: Create a `DataContext`

```
import React, { createContext, useContext, useEffect, useState } from 'react';

// Create a DataContext
const DataContext = createContext();

// Create a custom hook for easier access to the context
export const useData = () => {
  return useContext(DataContext);
};
```

Step 2: Create a `DataProvider` to Fetch and Store Data

This provider will handle fetching data from an API, store it in state, and make it available to all children components.

```
// DataProvider Component
export const DataProvider = ({ children }) => {
  const [data, setData] = useState([]);
  const [loading, setLoading] = useState(true);
  const [error, setError] = useState(null);

  // Fetch data from an API (replace with any API URL)
  useEffect(() => {
    const fetchData = async () => {
      try {
        const response = await fetch('https://api.example.com/products');
        const result = await response.json();
        setData(result); // Set the fetched data
      } catch (error) {
        setError('Failed to fetch data');
      } finally {
        setLoading(false);
      }
    };

    fetchData();
  }, []); // Empty dependency array to fetch once when component mounts

  // Provide the data, loading status, and any errors to children components
  return (
    <DataContext.Provider value={{ data, loading, error }}>
      {children}
    </DataContext.Provider>
  );
};
```

Step 3: Consume Data Using `useContext`

In child components, you can now consume the fetched data directly using the `useData` hook.

- Example Component 1: Display List of Products

```
import React from 'react';
import { useData } from './DataContext'; // Import the custom hook

const ProductList = () => {
  const { data, loading, error } = useData(); // Consume the context

  if (loading) {
    return <div>Loading...</div>;
  }

  if (error) {
    return <div>{error}</div>;
  }

  return (
    <div>
      <h2>Product List</h2>
      <ul>
        {data.map((product) => (
          <li key={product.id}>
            {product.name} - ${product.price}
          </li>
        ))}
      </ul>
    </div>
  );
};

export default ProductList;
```

Step 4: Use the `DataProvider` in Your App

In your main application file (`App.js`), wrap your application (or a section of it) in the `DataProvider` so that the data can be accessed throughout the component tree.

```
import React from 'react';
import { DataProvider } from './DataContext'; // Import DataProvider
import ProductList from './ProductList';

const App = () => {
  return (
    <DataProvider>
      <div>
        <h1>Product Dashboard</h1>
        <ProductList />
```

```
      </div>
    </DataProvider>
  );
};

export default App;
```

Explanation

1. `DataContext`: Provides the data, loading status, and error across the app.
2. `DataProvider`: Handles fetching data once on mount (using `useEffect`) and stores it in state.
3. `useData` **Hook**: Makes it easy to access the context data and consume it in any component.
4. `ProductList` **Component**: Accesses the fetched data and displays it in a list. It handles loading and error states as well.

Benefits of Fetching Data with Context

- **Global Data Access**: Makes the fetched data available throughout the app without the need for prop drilling.
- **Centralized State Management**: Keeps the fetching logic in one place, ensuring consistency across the app.
- **Scalability**: You can add more data-fetching providers for other parts of your app (e.g., user data, settings, etc.) and manage them all efficiently.

[useReducer + useContext]

- A good reference

```
// reducer/bookReducer.js
export const initialState = {
  books: [
    {
      id: 1,
      title: "book1",
    },
    {
      id: 2,
      title: "book2",
    },
  ],
};

export const reducer = (state, action) => {
  switch (action.type) {
    case "ADD":
      return state;
    case "DELETE":
      const filteredBooks = state.books.filter(
        (book) => book.id !== action.payload
      );
      return {
        ...state,
        books: filteredBooks,
      };

    default:
      return state;
  }
};

// context/BookContext.js
import { createContext } from "react";
const BookContext = createContext(null);

export default BookContext;

// hooks/useBookContext.js
// custom hook for using context
import { useContext } from "react";
import BookContext from "../context/BookContext";

export const useBookContext = () => {
  return useContext(BookContext);
};


// App.js
import React, { useReducer, useState } from "react";

import "./App.css";
import Books from "./components/Books";
import BookContext from "./context/BookContext";
import { initialState, reducer } from "./reducer/booksReducer";

function App() {
  const [state, dispatch] = useReducer(reducer, initialState);
  return (
    <div className="App">
        <BookContext.Provider value={{ state, dispatch }}>
          <Books />
        </BookContext.Provider>
```

```
    </div>
  );
}

export default App;

// Books.js
import React, { useContext } from "react";
import BookContext from "../context/BookContext";
import { useThemeContext } from "../context/ThemeContext";
import { useBookContext } from "../hooks/useBookContext";

const Books = () => {
  const context = useThemeContext();
  const { state, dispatch } = useBookContext();
  // const handleDeleteBook = (id) => {
  //   const filteredBooks = books.filter((book) => book.id !== id);
  //   setBooks(filteredBooks);
  // };
  return (
    <div className={context}>
      {state.books &&
        state.books.map((book) => {
          const { id, title } = book;
          return (
            <article key={id}>
              <h2>{id}</h2>
              <p>{title}</p>
              <button>edit book</button>
              <button
                onClick={() => {
                  dispatch({ type: "DELETE", payload: id });
                }}
              >
                delete book
              </button>
            </article>
          );
        })}
    </div>
  );
};

export default Books;
```

useState, useEffect, useReducer, useContext, custom hook practice

Below is a folder structure and corresponding code to demonstrate an example of managing **users** in a **React app** using **Context**, a **custom hook** for consuming the context, a **service layer** for API requests, **CRUD operations**, and **pagination**.

Folder Structure:

```
src/
|
├── components/
|   ├── Users/
|   |   ├── UsersList.js
|   |   ├── UserForm.js
|   |   ├── Pagination.js
|   |   └── index.js
|   └── Layout/
|       ├── Header.js
|       └── Footer.js
|
├── context/
|   └── UsersContext.js
|
├── hooks/
|   └── useUsers.js
|
├── services/
|   └── userService.js
|
├── App.js
└── index.js
```

---

1. Context (`UsersContext.js`)

We will use the context to provide the users' data and CRUD operations throughout the application.

```
import React, { createContext, useState, useEffect } from 'react';
import { getUsers } from '../services/userService';

const UsersContext = createContext();

export const UsersProvider = ({ children }) => {
  const [users, setUsers] = useState([]);
  const [loading, setLoading] = useState(true);
```

```
  const [error, setError] = useState(null);
  const [page, setPage] = useState(1);
  const [totalPages, setTotalPages] = useState(1);

  useEffect(() => {
    fetchUsers(page);
  }, [page]);

  const fetchUsers = async (pageNumber = 1) => {
    try {
      const data = await getUsers(pageNumber);
      setUsers(data.users);
      setTotalPages(data.totalPages);
      setLoading(false);
    } catch (err) {
      setError('Failed to load users.');
      setLoading(false);
    }
  };

  const addUser = (newUser) => setUsers((prev) => [...prev, newUser]);
  const updateUser = (updatedUser) =>
    setUsers((prev) =>
      prev.map((user) => (user.id === updatedUser.id ? updatedUser : user))
    );
  const deleteUser = (id) =>
    setUsers((prev) => prev.filter((user) => user.id !== id));

  return (
    <UsersContext.Provider
      value={{
        users,
        loading,
        error,
        addUser,
        updateUser,
        deleteUser,
        page,
        setPage,
        totalPages,
      }}
    >
      {children}
    </UsersContext.Provider>
  );
};

export default UsersContext;
```

---

2. Custom Hook (`useUsers.js`)

A custom hook to consume the `UsersContext`:

```
import { useContext } from 'react';
import UsersContext from '../context/UsersContext';

const useUsers = () => useContext(UsersContext);

export default useUsers;
```

---

3. Service Layer (`userService.js`)

This service handles API requests, which include fetching users and CRUD operations. For simplicity, let's assume you have an API.

```
import axios from 'axios';

const API_URL = 'https://example.com/api/users';

export const getUsers = async (page) => {
  const response = await axios.get(`${API_URL}?page=${page}`);
  return response.data;
};

export const createUser = async (userData) => {
  const response = await axios.post(API_URL, userData);
  return response.data;
};

export const updateUser = async (userId, userData) => {
  const response = await axios.put(`${API_URL}/${userId}`, userData);
  return response.data;
};

export const deleteUser = async (userId) => {
  const response = await axios.delete(`${API_URL}/${userId}`);
  return response.data;
};
```

4. Components

`UsersList.js`

A component that lists all the users and supports deleting a user:

```
import React from 'react';
import useUsers from '../../hooks/useUsers';

const UsersList = () => {
  const { users, deleteUser, loading, error } = useUsers();

  if (loading) return <p>Loading...</p>;
  if (error) return <p>{error}</p>;

  return (
    <ul>
      {users.map((user) => (
        <li key={user.id}>
          {user.name} - {user.email}
          <button onClick={() => deleteUser(user.id)}>Delete</button>
        </li>
      ))}
    </ul>
  );
};

export default UsersList;
```

`UserForm.js`

A form for adding or updating users:

```
import React, { useState } from 'react';
import useUsers from '../../hooks/useUsers';
import { createUser, updateUser } from '../../services/userService';

const UserForm = ({ existingUser }) => {
  const [name, setName] = useState(existingUser ? existingUser.name : '');
  const [email, setEmail] = useState(existingUser ? existingUser.email : '');
  const { addUser, updateUser: updateContextUser } = useUsers();

  const handleSubmit = async (e) => {
    e.preventDefault();
    const userData = { name, email };

    if (existingUser) {
      const updatedUser = await updateUser(existingUser.id, userData);
      updateContextUser(updatedUser);
    } else {
      const newUser = await createUser(userData);
      addUser(newUser);
    }

    setName('');
    setEmail('');
  };

  return (
    <form onSubmit={handleSubmit}>
      <input
        type="text"
        placeholder="Name"
        value={name}
        onChange={(e) => setName(e.target.value)}
      />
      <input
        type="email"
        placeholder="Email"
        value={email}
        onChange={(e) => setEmail(e.target.value)}
      />
      <button type="submit">{existingUser ? 'Update' : 'Add'} User</button>
    </form>
  );
};

export default UserForm;
```

`Pagination.js`

Handles pagination logic:

```
import React from 'react';
import useUsers from '../../hooks/useUsers';

const Pagination = () => {
  const { page, setPage, totalPages } = useUsers();
```

```
  return (
    <div>
      <button disabled={page === 1} onClick={() => setPage(page - 1)}>
        Previous
      </button>
      <span>
        Page {page} of {totalPages}
      </span>
      <button disabled={page === totalPages} onClick={() => setPage(page + 1)}>
        Next
      </button>
    </div>
  );
};

export default Pagination;
```

---

5. App.js

Combining all components together:

```
import React from 'react';
import { UsersProvider } from './context/UsersContext';
import UsersList from './components/Users/UsersList';
import UserForm from './components/Users/UserForm';
import Pagination from './components/Users/Pagination';

const App = () => {
  return (
    <UsersProvider>
      <div>
        <h1>User Management</h1>
        <UserForm />
        <UsersList />
        <Pagination />
      </div>
    </UsersProvider>
  );
};

export default App;
```

How it Works:

1. **Context (`UsersContext`)**:
   - Stores the list of users and provides CRUD operations.
   - Fetches data from the API on mount and when the page number changes.
2. **Custom Hook (`useUsers`)**:
   - A simplified way to access the context values in other components.
3. **Service Layer**:
   - Handles API requests for CRUD operations.
4. **Components**:
   - `UsersList`: Displays the list of users.
   - `UserForm`: A form for creating or updating a user.
   - `Pagination`: Handles pagination between user pages.

This structure helps in organizing the app into **modular**, **scalable**, and **reusable** parts, making it easier to manage complex state, especially in larger applications.

[57. user mgt crud app using useState]

- version 1: only useState, useEffect

```
//App.js
import React, { useState } from "react";

import Users from "./components/Users";
import "./App.css";
import NewUser from "./components/NewUser";

const App = () => {
  const [users, setUsers] = useState([
    {
      id: 1,
      username: "anisul",
    },
    {
```

```
      id: 2,
      username: "sakib",
    },
  ]);
  const [editableUser, setEditableUser] = useState(null);

  const addNewUser = (user) => {
    setUsers((prevUsers) => [...prevUsers, user]);
  };

  const editUser = (user) => {
    setEditableUser(user);
  };

  const deleteUser = (id) => {
    const filteredUsers = users.filter((user) => user.id !== id);
    setUsers(filteredUsers);
  };

  const updateUser = (updatedUser) => {
    console.log(updatedUser);
    const userIndex = users.findIndex((user) => user.id === updatedUser.id);
    const copiedUsers = [...users];
    copiedUsers.splice(userIndex, 1, updatedUser);
    setUsers(copiedUsers);
  };

  return (
    <div>
      <NewUser
        onAddNewUser={addNewUser}
        editableUser={editableUser}
        onUpdateUser={updateUser}
      />
      {users && (
        <Users users={users} onDeleteUser={deleteUser} onEditUser={editUser} />
      )}
    </div>
  );
};

export default App;

// components/NewUser.js
import React, { useState, useEffect } from "react";
import { v4 as uuidv4 } from "uuid";

const NewUser = ({ onAddNewUser, editableUser, onUpdateUser }) => {
  const [username, setUsername] = useState("");

  const handleSubmit = (event) => {
    event.preventDefault();

    if (editableUser) {
      const updatedUser = { id: editableUser.id, username };
      onUpdateUser(updatedUser);
    } else {
      const newUser = { id: uuidv4(), username };
      onAddNewUser(newUser);
      setUsername("");
    }
  };

  useEffect(() => {
    editableUser && setUsername(editableUser.username);
  }, [editableUser]);

  return (
    <div className="new-user">
      <h2>Register</h2>
      <form onSubmit={handleSubmit}>
        <input
          type="text"
          name="username"
          value={username}
          placeholder="Enter username"
          onChange={(e) => {
            setUsername(e.target.value);
          }}
          required
        />
        <button type="submit">{editableUser ? "Edit User" : "Add User"}</button>
      </form>
    </div>
  );
};

export default NewUser;

// components/Users.js
import React from "react";
import User from "./User";

const Users = ({ users, onDeleteUser, onEditUser }) => {
```

```
  return (
    <section className="users">
      {users.map((user) => (
        <User
          key={user.id}
          user={user}
          onDeleteUser={onDeleteUser}
          onEditUser={onEditUser}
        />
      ))}
    </section>
  );
};

export default Users;


// components/User.js
import React from "react";

const User = ({ user, onDeleteUser, onEditUser }) => {
  const { id, username } = user;

  const handleDelete = (id) => {
    onDeleteUser(id);
  };

  const handleEdit = (user) => {
    onEditUser(user);
  };

  return (
    <article className="user">
      <h2>{id}</h2>
      <p>{username}</p>
      <button
        onClick={() => {
          handleEdit(user);
        }}
      >
        Edit
      </button>
      <button
        onClick={() => {
          handleDelete(id);
        }}
      >
        Delete
      </button>
    </article>
  );
};

export default User;
```

- version 2 (useReducer added)

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

import Users from './components/Users';
import './App.css';
import NewUser from './components/NewUser';

const initialState = {
  users: [
    {
      id: 1,
      username: 'anisul',
    },
    {
      id: 2,
      username: 'sakib',
    },
  ],
};

const reducer = (state, action) => {
  switch (action.type) {
    case 'ADD_USER':
      return {
        ...state,
        users: [...state.users, action.payload],
      };
    case 'DELETE_USER':
      const filteredUsers = state.users.filter(
        (user) => user.id !== action.payload
      );
      return {
        ...state,
        users: filteredUsers,
      };
    case 'UPDATE_USER':
      const userIndex = state.users.findIndex(
```

```
        (user) => user.id === action.payload.id
      );
      const copiedUsers = [...state.users];
      copiedUsers.splice(userIndex, 1, action.payload);
      return {
        ...state,
        users: copiedUsers,
      };

    default:
      return state;
  }
};

const App = () => {
  const [state, dispatch] = useReducer(reducer, initialState);
  const [editableUser, setEditableUser] = useState(null);

  const addNewUser = (user) => {
    dispatch({ type: 'ADD_USER', payload: user });
  };

  const editUser = (user) => {
    setEditableUser(user);
  };

  const deleteUser = (id) => {
    dispatch({ type: 'DELETE_USER', payload: id });
  };

  const updateUser = (updatedUser) => {
    dispatch({ type: 'UPDATE_USER', payload: updatedUser });
  };

  return (
    <div>
      <NewUser
        onAddNewUser={addNewUser}
        editableUser={editableUser}
        onUpdateUser={updateUser}
      />
      {state.users && (
        <Users
          users={state.users}
          onDeleteUser={deleteUser}
          onEditUser={editUser}
        />
      )}
    </div>
  );
};

export default App;

// separte the reducer with initial states and exports them to use from the App.js
```

- version 3 (with useContext)

```
// UsersContext.js
import { createContext } from "react";
export const UsersContext = createContext(null);

// App.js
import React, { useState, useReducer } from "react";

import Users from "./components/Users";
import "./App.css";
import NewUser from "./components/NewUser";
import { initialState, reducer } from "./reducer/userReducer";
import { UsersContext } from "./context/UsersContext";

const App = () => {
  const [state, dispatch] = useReducer(reducer, initialState);
  const [editableUser, setEditableUser] = useState(null);

  return (
    <div>
      <UsersContext.Provider
        value={{ state, dispatch, editableUser, setEditableUser }}
      >
        <NewUser />
        {state.users && <Users />}
      </UsersContext.Provider>
    </div>
  );
};

export default App;

// Users.js
import React, { useContext } from "react";
import { UsersContext } from "../context/UsersContext";
```

```
const User = ({ user }) => {
  const { id, username } = user;
  const { dispatch, setEditableUser } = useContext(UsersContext);

  const handleDelete = (id) => {
    dispatch({ type: "DELETE_USER", payload: id });
  };

  const handleEdit = (user) => {
    setEditableUser(user);
  };

  return (
    <article className="user">
      <h2>{id}</h2>
      <p>{username}</p>
      <button
        onClick={() => {
          handleEdit(user);
        }}
      >
        Edit
      </button>
      <button
        onClick={() => {
          handleDelete(id);
        }}
      >
        Delete
      </button>
    </article>
  );
};

export default User;

// User.js
import React, { useContext } from "react";
import { UsersContext } from "../context/UsersContext";

const User = ({ user }) => {
  const { id, username } = user;
  const { dispatch, setEditableUser } = useContext(UsersContext);

  const handleDelete = (id) => {
    dispatch({ type: "DELETE_USER", payload: id });
  };

  const handleEdit = (user) => {
    setEditableUser(user);
  };

  return (
    <article className="user">
      <h2>{id}</h2>
      <p>{username}</p>
      <button
        onClick={() => {
          handleEdit(user);
        }}
      >
        Edit
      </button>
      <button
        onClick={() => {
          handleDelete(id);
        }}
      >
        Delete
      </button>
    </article>
  );
};

export default User;

// NewUser.js
import React, { useState, useEffect, useContext } from "react";
import { v4 as uuidv4 } from "uuid";
import { UsersContext } from "../context/UsersContext";

const NewUser = () => {
  const { dispatch, editableUser } = useContext(UsersContext);
  const [username, setUsername] = useState("");

  const handleSubmit = (event) => {
    event.preventDefault();

    if (editableUser) {
      const updatedUser = { id: editableUser.id, username };
      dispatch({ type: "UPDATE_USER", payload: updatedUser });
    } else {
      const newUser = { id: uuidv4(), username };
      dispatch({ type: "ADD_USER", payload: newUser });
```

```
      setUsername("");
    }
  };

  useEffect(() => {
    editableUser && setUsername(editableUser.username);
  }, [editableUser]);

  return (
    <div className="new-user">
      <h2>Register</h2>
      <form onSubmit={handleSubmit}>
        <input
          type="text"
          name="username"
          value={username}
          placeholder="Enter username"
          onChange={(e) => {
            setUsername(e.target.value);
          }}
          required
        />
        <button type="submit">{editableUser ? "Edit User" : "Add User"}</button>
      </form>
    </div>
  );
};

export default NewUser;
```

- version 4 (custom hook for useContext)

```
// hooks/useUsersContext.js
import { useContext } from 'react';

import { UsersContext } from '../context/UsersContext';

export const useUserContext = () => {
  return useContext(UsersContext);
};
```

- version 5 (creating Store.js)

```
import React, { useState, useReducer } from "react";
import { UsersContext } from "../context/UsersContext";
import { initialState, reducer } from "../reducer/userReducer";

const Store = ({ children }) => {
  const [state, dispatch] = useReducer(reducer, initialState);
  const [editableUser, setEditableUser] = useState(null);

  const value = {
    users: state.users,
    addUser: (newUser) => {
      dispatch({ type: "ADD_USER", payload: newUser });
    },
    deleteUser: (id) => {
      dispatch({ type: "DELETE_USER", payload: id });
    },
    updateUser: (updatedUser) => {
      dispatch({ type: "UPDATE_USER", payload: updatedUser });
    },
    editableUser,
    setEditableUser,
  };

  return (
    <UsersContext.Provider value={value}>{children}</UsersContext.Provider>
  );
};

export default Store;

// provide the Store.js
import React from "react";

import Users from "./components/Users";
import "./App.css";
import NewUser from "./components/NewUser";
import Store from "./store/Store";

const App = () => {
  return (
    <div>
      <Store>
        <NewUser />
        <Users />
      </Store>
    </div>
  );
};
```

```
export default App;

// use the Store.js
// Users.js
import React from "react";
import { useUserContext } from "../hooks/useUsersContext";
import User from "./User";

const Users = () => {
  const { users } = useUserContext();

  return (
    <section className="users">
      {users.map((user) => (
        <User key={user.id} user={user} />
      ))}
    </section>
  );
};

export default Users;

// User.js
import React from "react";

import { useUserContext } from "../hooks/useUsersContext";

const User = ({ user }) => {
  const { id, username } = user;
  const { deleteUser, setEditableUser } = useUserContext();

  const handleDelete = (id) => {
    deleteUser(id);
  };

  const handleEdit = (user) => {
    setEditableUser(user);
  };

  return (
    <article className="user">
      <h2>{id}</h2>
      <p>{username}</p>
      <button
        onClick={() => {
          handleEdit(user);
        }}
      >
        Edit
      </button>
      <button
        onClick={() => {
          handleDelete(id);
        }}
      >
        Delete
      </button>
    </article>
  );
};

export default User;

//NewUser.js
import React, { useState, useEffect } from "react";
import { v4 as uuidv4 } from "uuid";

import { useUserContext } from "../hooks/useUsersContext";

const NewUser = () => {
  const { addUser, updateUser, editableUser } = useUserContext();
  const [username, setUsername] = useState("");

  const handleSubmit = (event) => {
    event.preventDefault();

    if (editableUser) {
      const updatedUser = { id: editableUser.id, username };
      updateUser(updatedUser);
    } else {
      const newUser = { id: uuidv4(), username };
      addUser(newUser);
      setUsername("");
    }
  };

  useEffect(() => {
    editableUser && setUsername(editableUser.username);
  }, [editableUser]);

  return (
    <div className="new-user">
      <h2>Register</h2>
```

```
      <form onSubmit={handleSubmit}>
        <input
          type="text"
          name="username"
          value={username}
          placeholder="Enter username"
          onChange={(e) => {
            setUsername(e.target.value);
          }}
          required
        />
        <button type="submit">{editableUser ? "Edit User" : "Add User"}</button>
      </form>
    </div>
  );
};

export default NewUser;
```

58. REST API state globally with useContext

```
// context/MoviesContext.js
import { createContext } from "react";

export const MoviesContext = createContext([]);

// store/Store.js
import React, { useEffect, useState } from "react";
import axios from "axios";
import { MoviesContext } from "./MoviesContext";

const URL = "https://my.api.mockaroo.com/movies.json?key=c5bae7e0";
const Store = ({ children }) => {
  const [movies, setMovies] = useState([]);

  const fetchMovies = async () => {
    const result = await axios.get(URL);
    setMovies(result.data);
  };
  useEffect(() => {
    fetchMovies();
  }, []);

  return (
    <MoviesContext.Provider value={{ movies, setMovies }}>
      {children}
    </MoviesContext.Provider>
  );
};

export default Store;


// custom hook for useContext
import { useContext } from "react";

import { MoviesContext } from "../context/MoviesContext";

export const useMovieContext = () => {
  return useContext(MoviesContext);
};

// App.js
import React from "react";
import { useMovieContext } from "./hooks/useMoviesContext";

const App = () => {
  const { movies } = useMovieContext();
  return (
    <section className="movies">
      {movies &&
        movies.map((movie) => {
          return (
            <article key={movie.id} className="movie">
              <h3>{movie.id}</h3>
              <p>{movie.title}</p>
            </article>
          );
        })}
    </section>
  );
};

export default App;
```

59. shppoing-cart-useReducer-usecontext

Part-11 redux, redex toolkit

- My redux documentation
  - redux = useContext + useReducer
  - check redux videos and then redux-toolkit
  - how to use redux devtools

60. Counter App using Redux-toolkit

61. Fetch data using Redux-toolkit

```
//features/users/usersSlice.js
import { createAsyncThunk, createSlice } from "@reduxjs/toolkit";
import axios from "axios";

// action creator for fetching data
export const fetchUsers = createAsyncThunk(
  "users/fetchUsers",
  async (_, thunkAPI) => {
    const { rejectWithValue } = thunkAPI;
    try {
      const response = await axios.get("http://localhost:3001/users");
      return response.data;
    } catch (error) {
      return rejectWithValue(error.message);
    }
  }
);

// action creator for deleteing data
export const deleteUser = createAsyncThunk(
  "users/deleteUser",
  async (data, thunkAPI) => {
    const { rejectWithValue } = thunkAPI;
    try {
      const response = await axios.delete(
        `http://localhost:3001/users/${data}`
      );
      return response.data;
    } catch (error) {
      return rejectWithValue(error.message);
    }
  }
);

// action creator for deleteing data
export const createUser = createAsyncThunk(
  "users/createUser",
  async (data, thunkAPI) => {
    const { rejectWithValue } = thunkAPI;
    try {
      const response = await axios.post(`http://localhost:3001/users}`, data);
      return response.data;
    } catch (error) {
      return rejectWithValue(error.message);
    }
  }
);

const usersSlice = createSlice({
  name: "users",
  initialState: {
    isLoading: false,
    error: null,
    users: [],
  },
  reducers: {},

  // extraReducers will handle the asynchronous promise states: pending, fulfilled or reject
  extraReducers: (builder) => {
    // fetchUsers
    builder.addCase(fetchUsers.pending, (state) => {
      state.isLoading = true;
      state.error = null;
    });
    builder.addCase(fetchUsers.fulfilled, (state, action) => {
      state.users = action.payload;
      state.isLoading = false;
    });
    builder.addCase(fetchUsers.rejected, (state, action) => {
      state.error = action.payload;
      state.isLoading = false;
    });

    // deleteUser
    builder.addCase(deleteUser.pending, (state, action) => {
```

```
      state.isLoading = true;
      state.error = null;
    });
    builder.addCase(deleteUser.fulfilled, (state, action) => {
      state.users = state.users.filter((user) => user.id !== action.payload.id);
      state.isLoading = false;
    });
    builder.addCase(deleteUser.rejected, (state, action) => {
      state.error = action.payload;
      state.isLoading = false;
    });

    // addUser
    builder.addCase(createUser.pending, (state, action) => {
      state.isLoading = true;
      state.error = null;
    });
    builder.addCase(createUser.fulfilled, (state, action) => {
      state.users.push(action.payload);
      state.isLoading = false;
    });
    builder.addCase(createUser.rejected, (state, action) => {
      state.error = action.payload;
      state.isLoading = false;
    });
  },
});

export default usersSlice.reducer;



// app/store.js
import { configureStore } from "@reduxjs/toolkit";

import counterReducer from "../features/counter/counterSlice";
import usersReducer from "../features/users/usersSlice";

export const store = configureStore({
  reducer: {
    counterR: counterReducer,
    usersR: usersReducer,
  },
});


// features/Users.js
import React, { useEffect, useCallback } from "react";
import { useDispatch, useSelector } from "react-redux";
import { deleteUser, fetchUsers } from "./usersSlice";

const Users = () => {
  const { isLoading, users, error } = useSelector((state) => state.usersR);
  const dispatch = useDispatch();

  const fetchAllUsers = useCallback(() => {
    dispatch(fetchUsers());
  }, [dispatch]);

  useEffect(() => {
    fetchAllUsers();
  }, [fetchAllUsers]);

  const deleteUserById = (id) => {
    dispatch(deleteUser(id)).then((res) => console.log(res));
    fetchAllUsers();
  };

  if (isLoading) {
    return <p>Loading Users...</p>;
  }
  if (error) {
    return <p>{error}</p>;
  }

  return (
    <div>
      {users &&
        users.map((user) => {
          return (
            <article key={user.id}>
              <h2>{user.id}</h2>
              <h2>{user.name}</h2>
              <button
                onClick={() => {
                  deleteUserById(user.id);
                }}
              >
                delete
              </button>
            </article>
          );
        })}
    </div>
```

```
  );
};

export default Users;
```

62. Books CRUD APP using Redux-toolkit

- Project's GitHub link

63. RTK Query

- Example 1

```
// features/apiSlice
import { createApi, fetchBaseQuery } from "@reduxjs/toolkit/query/react";

export const productsApi = createApi({
  reducerPath: "productsApi",
  baseQuery: fetchBaseQuery({ baseUrl: "https://dummyjson.com/" }),
  endpoints: (builder) => ({
    getAllProducts: builder.query({
      query: () => "products",
    }),
    getProduct: builder.query({
      query: (product) => `products/search?q=${product}`,
    }),
  }),
});

// created for us
export const { useGetAllProductsQuery, useGetProductQuery } = productsApi;

// App.js
import React from "react";
import { Provider } from "react-redux";
import { store } from "./app/store";
import Data from "./components/Data";
import { ApiProvider } from "@reduxjs/toolkit/query/react";
import { productsApi } from "./features/apiSlice";
const App = () => {
  return (
    <Provider store={store}>
      <ApiProvider api={productsApi}>
        <div>
          <Data />
        </div>
      </ApiProvider>
    </Provider>
  );
};

export default App;

// Data.js
import React from "react";
import {
  useGetAllProductsQuery,
  useGetProductQuery,
} from "../features/apiSlice";

const Data = () => {
  const {
    data: allProducts,
    error,
    isError,
    isLoading,
  } = useGetAllProductsQuery();
  const { data: product } = useGetProductQuery("iphone");

  if (isLoading) return <h1>Loading...</h1>;
  return <div>Data</div>;
};

export default Data;
```

- A complete CRUD APP using RTK Query

RTK (new version)

- RTK Query is a powerful data fetching and caching tool built into Redux Toolkit. It simplifies the process of fetching, caching, synchronizing, and updating data in your application.
- basic project setup
  - `npx create vite@latest projectName --template react`
  - `npm install @reduxjs/toolkit react-redux`
  - clean up the project

- create service or slice in RTK Query
  - create app/service/dummyData.js
  - create store.js inside app folder
  - createApi(): The core of RTK Query's functionality. It allows you to define a set of endpoints describe how to retrieve data from a series of endpoints, including configuration of how to fetch and transform that data. In most cases, you should use this once per app, with "one API slice per base URL" as a rule of thumb. define endpoints for fetching data + configure how to fetch and transform data.
  - fetchBaseQuery(): A small wrapper around fetch that aims to simplify requests. Intended as the recommended baseQuery to be used in createApi for the majority of users.
- create first endpoint

```
// features/api/apiSlice.js = logic goes here

import { createApi, fetchBaseQuery } from '@reduxjs/toolkit/query/react';
```

Releases

No releases published

Packages

No packages published