React Router DOM

1. Router (URL)
2. SPA
3. Nested Routing
4. Path Parameter

■ Router

- 사용자의 요청을 각 담당 **컴포넌트로 연결**하는 기능

  ➔ 각 주소에 대한 화면을 보여주는 것

  ex) /example/a → Hello

  /board/1 → 1번 게시물 내용

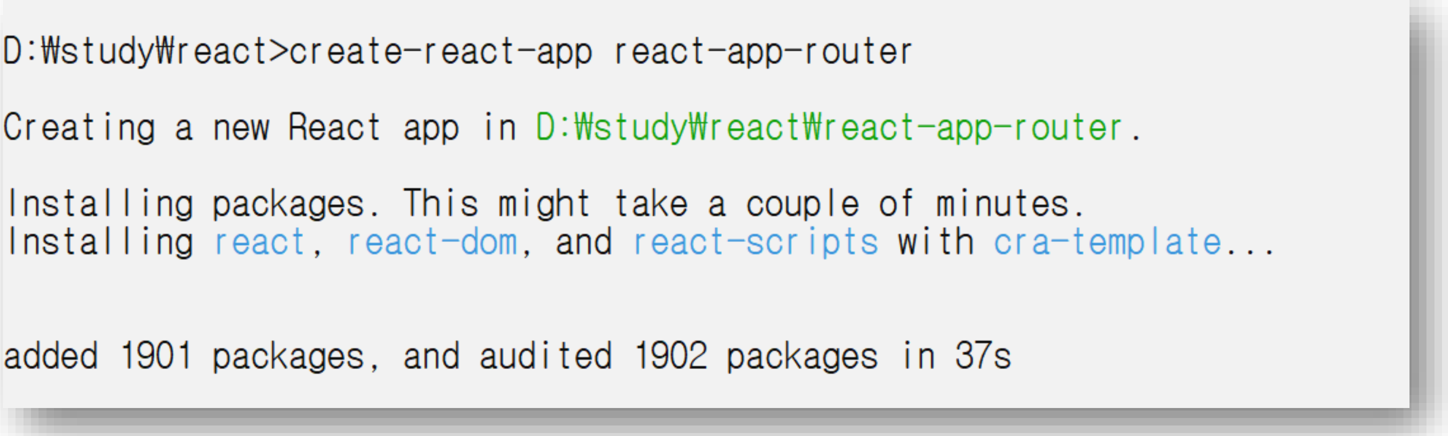
  /user → 회원 목록

- URL은 변경되지만 화면 이동없이 특정 부분만 렌더링하는 기능 제공

■ Router

● 프로젝트 생성

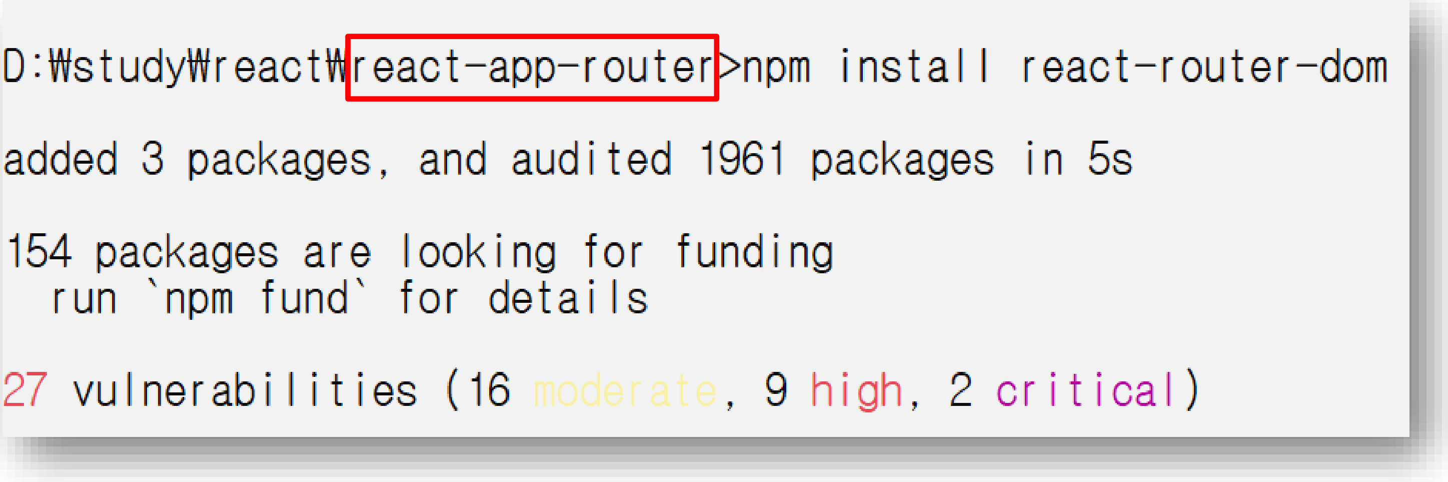
```
create-react-app react-app-router
```



```
D:₩study₩react>create-react-app react-app-router

Creating a new React app in D:₩study₩react₩react-app-router.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts with cra-template...


added 1901 packages, and audited 1902 packages in 37s
```

● 라이브러리 설치 (react-router-dom)

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



```
D:₩study₩react₩react-app-router>npm install react-router-dom

added 3 packages, and audited 1961 packages in 5s

154 packages are looking for funding
  run `npm fund` for details

27 vulnerabilities (16 moderate, 9 high, 2 critical)
```

■ Router

● 기본 컴포넌트 작성

App.js

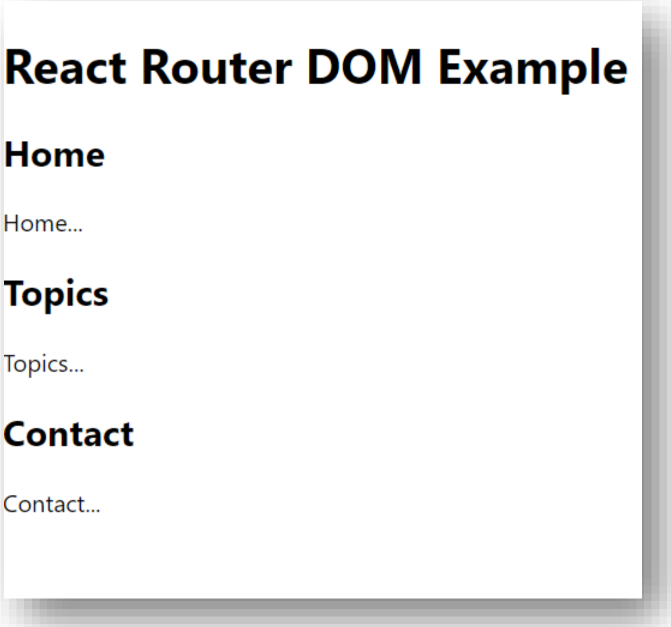
```
import './App.css';

function Home() {
  return (
    <div>
      <h2>Home</h2>
      Home...
    </div>
  )
}

function Topics() {
  return (
    <div>
      <h2>Topics</h2>
      Topics...
    </div>
  )
}
```

Router

● 기본 컴포넌트 작성

App.js

```
function Contact() {
  return (
    <div>
      <h2>Contact</h2>
      Contact...
    </div>
  )
}

function App() {
  return (
    <div>
      <h1>React Router DOM Example</h1>
      <Home></Home>
      <Topics></Topics>
      <Contact></Contact>
    </div>
  );
}

export default App;
```



React Router DOM Example

Home

Home...

Topics

Topics...

Contact

Contact...

■ Router

● Router 적용

- <BrowserRouter> → <Routes> → <Route>

```
<BrowserRouter>
  <Routes>
    <Route path="/url1" element={Component}></Route>
    <Route path="/url2" element={Component}></Route>
    <Route path="/url3" element={Component}></Route>
  </Routes>
</BrowserRouter>
```

- <XXXRouter> :
  - router-dom에 의해 동작하는 컴포넌트들을 감싸기 위한 Wrapper 컴포넌트
  - 최상위 컴포넌트인 App에 적용
  - **Browser** / Hash / Memory / Native / Static Router

■ Router

● Router 적용

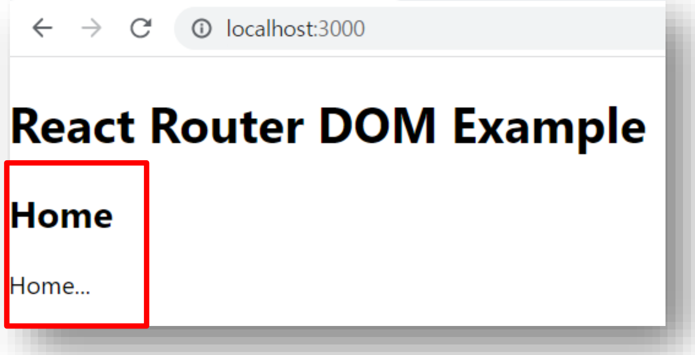
App.js

```
import {
  BrowserRouter, Routes, Route } from 'react-router-dom';
...
function App() {
  return (
    <BrowserRouter>
      <div>
        <h1>React Router DOM Example</h1>
        <Routes>
          <Route path="/" element={<Home></Home>}></Route>
          <Route path="/topics" element={<Topics></Topics>}></Route>
          <Route path="/contact"
                 element={<Contact></Contact>}></Route>
        </Routes>
      </div>
    </BrowserRouter>
  );
}
...
```

Router

Router 적용

http://localhost:3000

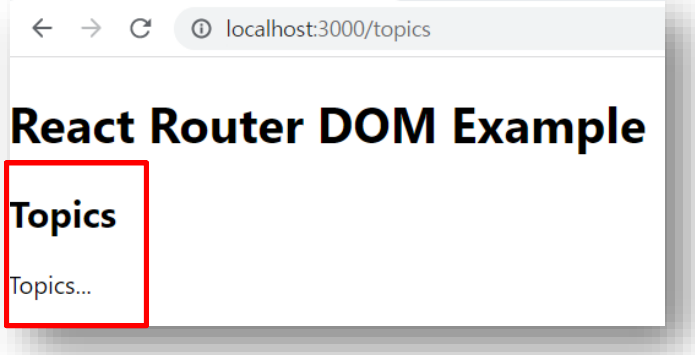

localhost:3000

React Router DOM Example

Home

Home...

http://localhost:3000/topics

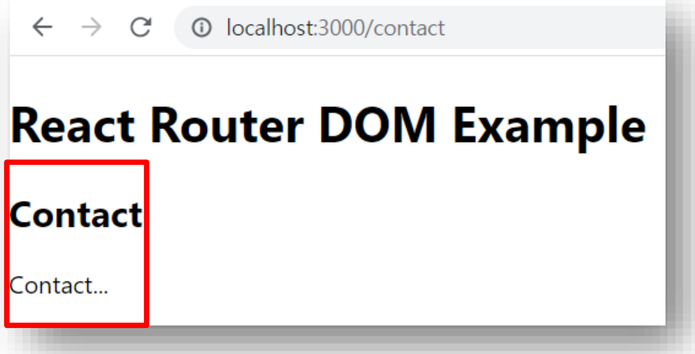

localhost:3000/topics

React Router DOM Example

Topics

Topics...

http://localhost:3000/contact


localhost:3000/contact

React Router DOM Example

Contact

Contact...

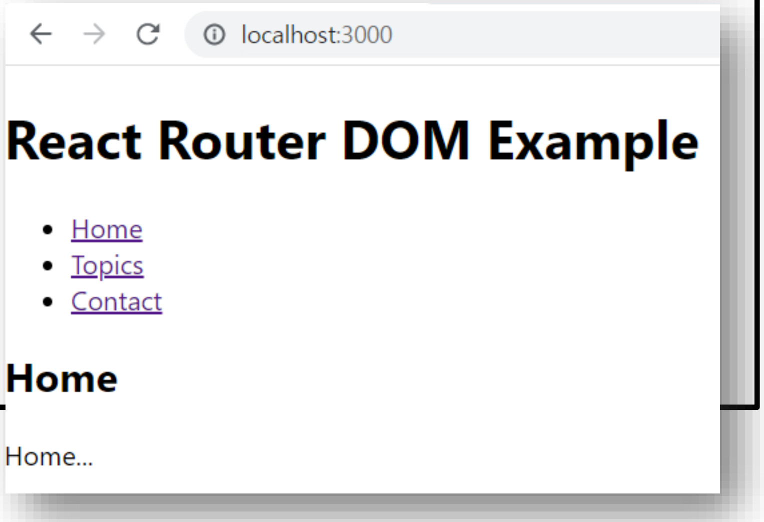
■ Router

● 네비게이션 메뉴 : <a> 사용

App.js

```
function App() {
  return (
    <BrowserRouter>
      <div>
        <h1>React Router DOM Example</h1>

        <ul>
          <li><a href='/'>Home</a></li>
          <li><a href='/topics'>Topics</a></li>
          <li><a href='/contact'>Contact</a></li>
        </ul>

       <Routes>
          ...
        </Routes>
      </div>
    </BrowserRouter>
  );
}
```

화면이 새로고침 되면서 출력



React Router DOM Example

- Home
- Topics
- Contact

Home

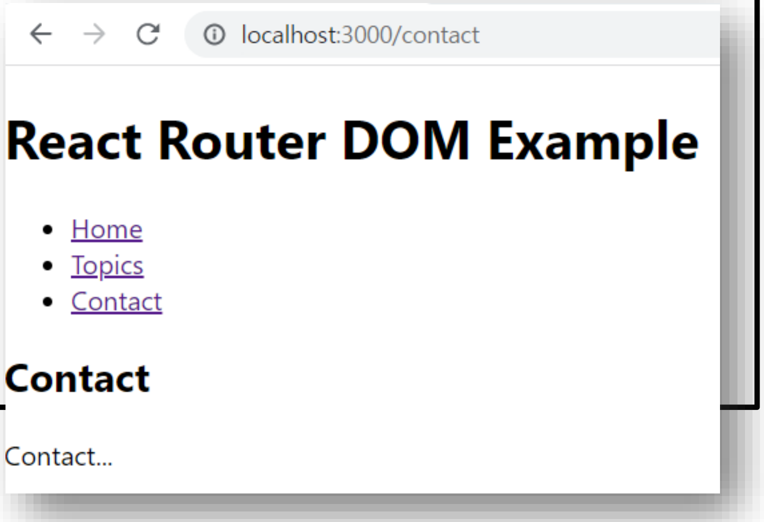
Home...

■ Router

- SPA(Single Page Application) : <a> ➔ <Link>

App.js

```
import {BrowserRouter, Routes, Route, Link} from 'react-router-dom';
...
function App() {
  return (
    <BrowserRouter>
      <div>
        <h1>React Router DOM Example</h1>
        <ul>
          <li><Link to="/">Home</Link></li>
          <li><Link to="/topics">Topics</Link></li>
          <li><Link to="/contact">Contact</Link></li>
        </ul>
        <Routes>
          ...
        </Routes>
      </div>
    </BrowserRouter>
  );
}
```



React Router DOM Example

- Home
- Topics
- Contact

Contact

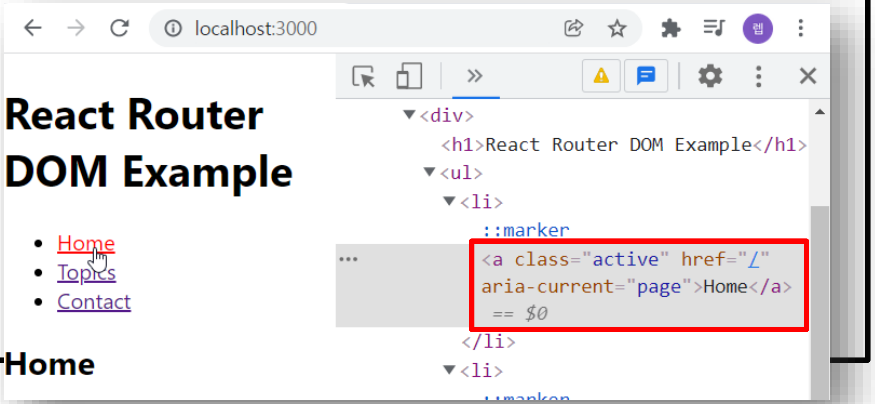
Contact...

■ Router

- SPA(Single Page Application) : <a> ➔ <NavLink>

App.js

```
import {BrowserRouter, Routes, Route, NavLink} from 'react-router-dom';
...
function App() {
  return (
    <BrowserRouter>
      <div>
        <h1>React Router DOM Example</h1>
        <ul>
          <li><NavLink to="/">Home</NavLink></li>
          <li><NavLink to="/topics">Topics</NavLink></li>
          <li><NavLink to="/contact">Contact</NavLink></li>
        </ul>
        <Routes>
          ...
        </Routes>
      </div>
    </BrowserRouter>
  );
}
```



React Router DOM Example

- Home
- Topics
- Contact

Home

```
▼<div>
   <h1>React Router DOM Example</h1>
  ▼<ul>
    ▼<li>
       ::marker
       <a class="active" href="/"
       aria-current="page">Home</a>
        == $0
     </li>
    ▼<li>
       ::marker
```

선택 요소 표시 (active, page)

■ Router

● Nested Routing : <Route> → <Route>

App.js

```
...

function Topic() {
  return (
    <div>Topic...</div>
  );
}

...

function App() {
  ...
          <Route path="/topics" element={<Topics></Topics>}>
            <Route path='1' element={<Topic></Topic>}></Route>
            <Route path='2' element={<Topic></Topic>}></Route>
            <Route path='3' element={<Topic></Topic>}></Route>
          </Route>
  ...
```

하위 주소 입력 (/topics/1 /topics/2 와 같이 전체 주소도 사용 가능)

■ Router

● Nested Routing : <Route> → <Route>

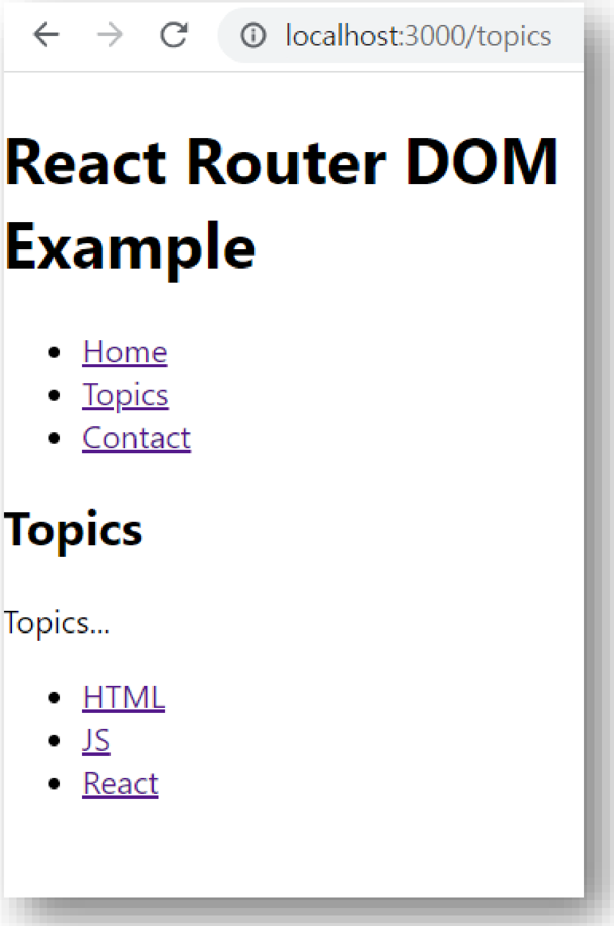
App.js

```
import {
  BrowserRouter, Routes, Route, Link,
  NavLink, Outlet } from 'react-router-dom';
...
function Topics() {
  return (
    <div>
      <h2>Topics</h2>
      Topics...
      <ul>
        <li><NavLink to='/topics/1'>HTML</NavLink></li>
        <li><NavLink to='/topics/2'>JS</NavLink></li>
        <li><NavLink to='/topics/3'>React</NavLink></li>
      </ul>

      <Outlet></Outlet>
    </div>
  )
}
...
```

하위 컴포넌트가 보여질 부분

Router

- Nested Routing : `<Route>` → `<Route>`



localhost:3000/topics

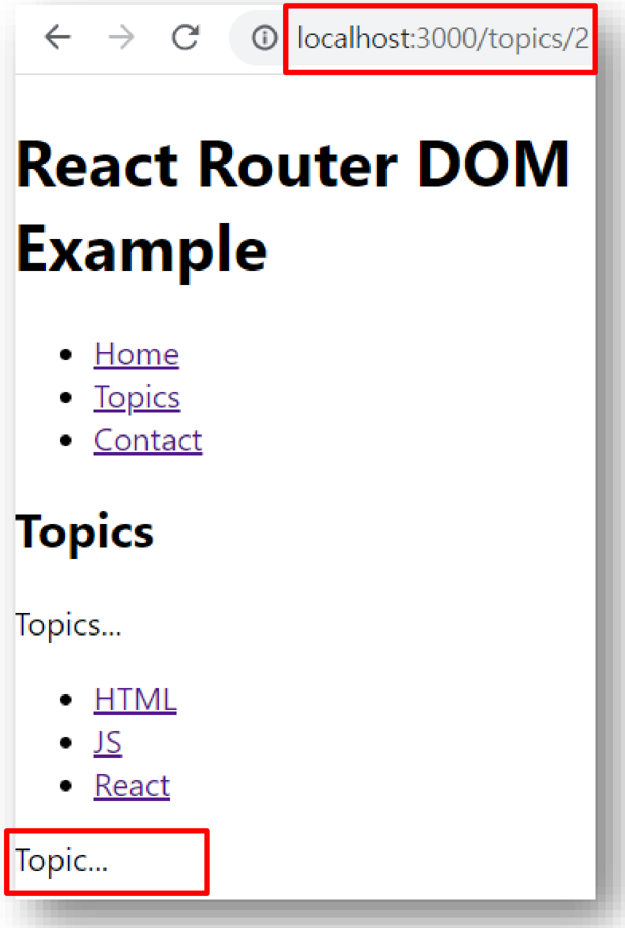
React Router DOM Example

- Home
- Topics
- Contact

Topics

Topics...

- HTML
- JS
- React



localhost:3000/topics/2

React Router DOM Example

- Home
- Topics
- Contact

Topics

Topics...

- HTML
- JS
- React

Topic...

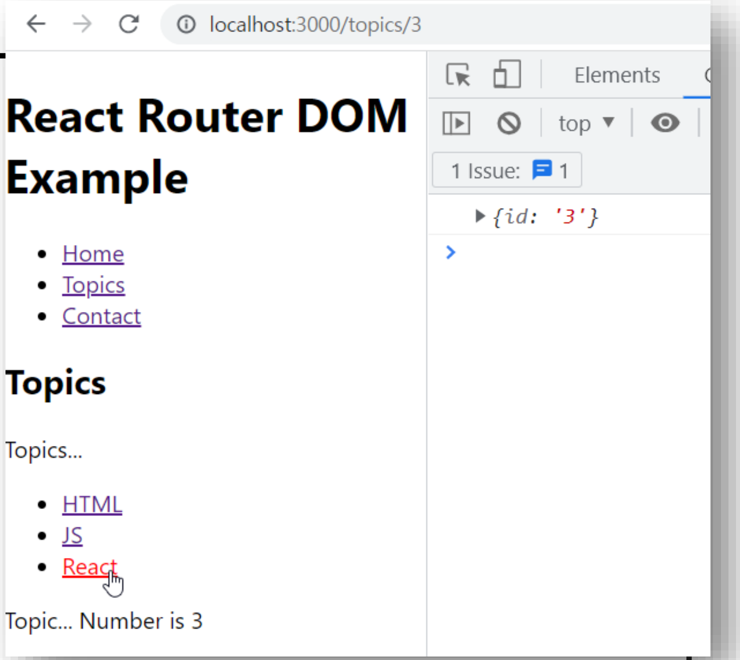
■ Router

- Path Parameter (Path Variable) : useParams()

App.js

```
...
function Topic() {
  const { id } = useParams();

  return (
    <div>
      Topic...
      Number is {id}
    </div>
  );
}

...

function App() {
  ...
          <Route path="/topics" element={<Topics></Topics>}>
            <Route path=':id' element={<Topic></Topic>}></Route>
          </Route>
  ...
```

key를 사용하여 데이터를 조회하도록 수정



localhost:3000/topics/3

React Router DOM Example

- Home
- Topics
- Contact

Topics

Topics...

- HTML
- JS
- React

Topic... Number is 3

```
▸{id: '3'}
```

■ Router

● 목록(Topics) 수정

App.js

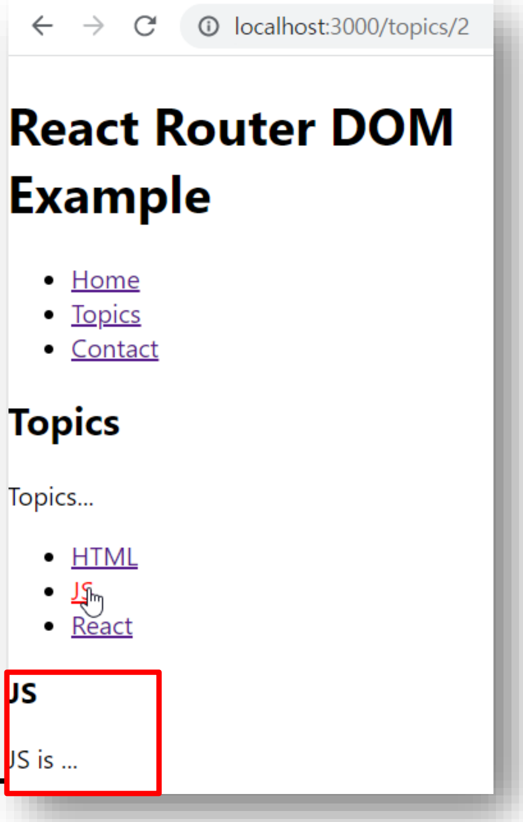
```
const contents = [
  {id: 1, title: 'HTML', description: 'HTML is ...'},
  {id: 2, title: 'JS', description: 'JS is ...'},
  {id: 3, title: 'React', description: 'React is ...'}
];

function Topics() {
  const list = [];
  for(let i = 0; i < contents.length; i++) {
    list.push(
      <li key={contents[i].id}>
        <NavLink to={`/topics/${contents[i].id}`}>contents[i].title</NavLink>
      </li>
    )
  }
  return (
    <div>
      <h2>Topics</h2>
      Topics...
      <ul>{list}</ul>
      <Outlet></Outlet>
    </div>
  )
}
```

■ Router

● 상세페이지(Topic) 수정

App.js

```
function Topic() {
  const { id } = useParams();
  let selected_topic = {
    title: 'Sorry', description: 'Not Found'
  }
  for(const topic of contents) {
    if(topic.id === Number(id)) {
      selected_topic = topic;
      break;
    }
  }
  return (
    <div>
      <h3>{selected_topic.title}</h3>
      {selected_topic.description}
    </div>
  );
}
```



React Router DOM Example

- Home
- Topics
- Contact

Topics

Topics...

- HTML
- JS
- React

JS

JS is ...