JSON server와 axios

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# JSON server

## 개요

테스트 하기 위해 필요한 백엔드 서버를 간단하게 만들어주는 도구.

테스트 데이터가 들어있는 JSON 파일만 만들면 (예: students-db.json),

이 파일에 들어있는 데이터를 조회, 등록, 수정, 삭제하기 위한

백엔드 REST API 서비스가 자동으로 실행된다.

조회조건, 정렬, pagination 기능도 자동으로 제공된다.

### 설치

|  |
| --- |
| npm install -g json-server |

### 실행

|  |
| --- |
| json-server --watch students-db.json |

위 명령에 의해 백엔드 REST API 서비스가 3000번 포트에서 시작된다.

포트 번호를 변경하려면 --port 3001 옵션을 주면 된다.

## student3 프로젝트

### 프로젝트 생성

|  |
| --- |
| npx create-react-app student3 --template typescript |

### json-server 설치

|  |
| --- |
| npm install -g json-server |

### students-db.json 생성

|  |
| --- |
| { "departments":    [ {"id":1,"name":"소프트웨어공학과","shortName":"소프","phone":"02-2610-9563"},      {"id":2,"name":"컴퓨터공학과","shortName":"컴공","phone":"02-2610-9565"},      {"id":3,"name":"정보통신공학과","shortName":"정통","phone":"02-2610-9568"},      {"id":4,"name":"글로컬IT공학과","shortName":"글티","phone":"02-2610-9569"}],    "students":    [ {"id":1,"studentNo":"201532006","name":"최하은","phone":"010-4361-1145","sex":"여","email":"choi064@skhu.ac.kr","departmentId":1},      {"id":2,"studentNo":"201532007","name":"김진영","phone":"010-3415-1238","sex":"남","email":"kim073@skhu.ac.kr","departmentId":3},      {"id":3,"studentNo":"201532008","name":"나철진","phone":"010-8703-1239","sex":"남","email":"na088@skhu.ac.kr","departmentId":3},      {"id":4,"studentNo":"201532009","name":"이익수","phone":"010-7875-1251","sex":"남","email":"lee097@skhu.ac.kr","departmentId":4},      {"id":5,"studentNo":"201532010","name":"이제문","phone":"010-7700-1333","sex":"남","email":"lee107@skhu.ac.kr","departmentId":1},      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{"id":118,"studentNo":"201832028","name":"이사육","phone":"010-8269-7677","sex":"남","email":"lee288@skhu.ac.kr","departmentId":4},      {"id":119,"studentNo":"201832029","name":"이진생","phone":"010-3293-7685","sex":"남","email":"lee293@skhu.ac.kr","departmentId":2},      {"id":120,"studentNo":"201832030","name":"김승영","phone":"010-8682-7816","sex":"남","email":"kim308@skhu.ac.kr","departmentId":1},      {"id":121,"studentNo":"201932006","name":"신정효","phone":"010-5439-7858","sex":"여","email":"sin065@skhu.ac.kr","departmentId":3},      {"id":122,"studentNo":"201932007","name":"김곤일","phone":"010-6094-7885","sex":"남","email":"kim076@skhu.ac.kr","departmentId":2},      {"id":123,"studentNo":"201932008","name":"황규동","phone":"010-5940-7969","sex":"남","email":"hwang085@skhu.ac.kr","departmentId":2},      {"id":124,"studentNo":"201932009","name":"조화병","phone":"010-2497-8019","sex":"여","email":"ko092@skhu.ac.kr","departmentId":1},      {"id":125,"studentNo":"201932010","name":"김영희","phone":"010-4847-8088","sex":"여","email":"kim104@skhu.ac.kr","departmentId":4},      {"id":126,"studentNo":"201932011","name":"김규태","phone":"010-9619-8116","sex":"남","email":"kim119@skhu.ac.kr","departmentId":3},      {"id":127,"studentNo":"201932012","name":"김희진","phone":"010-1558-8146","sex":"여","email":"kim121@skhu.ac.kr","departmentId":2},      {"id":128,"studentNo":"201932013","name":"장남석","phone":"010-9465-8203","sex":"남","email":"jang139@skhu.ac.kr","departmentId":3},      {"id":129,"studentNo":"201932014","name":"이상은","phone":"010-7659-8206","sex":"남","email":"lee147@skhu.ac.kr","departmentId":1},      {"id":130,"studentNo":"201932015","name":"박삼재","phone":"010-2969-8319","sex":"남","email":"park152@skhu.ac.kr","departmentId":2},      {"id":131,"studentNo":"201935015","name":"신호진","phone":"010-1165-8320","sex":"남","email":"sin151@skhu.ac.kr","departmentId":4},      {"id":132,"studentNo":"201933016","name":"한섭계","phone":"010-4467-8333","sex":"남","email":"han164@skhu.ac.kr","departmentId":2},      {"id":133,"studentNo":"201932016","name":"도재인","phone":"010-7164-8413","sex":"남","email":"do167@skhu.ac.kr","departmentId":1},      {"id":134,"studentNo":"201934017","name":"김하지","phone":"010-9530-8535","sex":"남","email":"kim179@skhu.ac.kr","departmentId":3},      {"id":135,"studentNo":"201932017","name":"김준호","phone":"010-4717-8565","sex":"남","email":"kim174@skhu.ac.kr","departmentId":1},      {"id":136,"studentNo":"201932018","name":"조진동","phone":"010-6705-8735","sex":"남","email":"ko186@skhu.ac.kr","departmentId":4},      {"id":137,"studentNo":"201935019","name":"최선예","phone":"010-6975-8804","sex":"여","email":"choi196@skhu.ac.kr","departmentId":4},      {"id":138,"studentNo":"201933019","name":"김영균","phone":"010-2595-8854","sex":"남","email":"kim192@skhu.ac.kr","departmentId":2},      {"id":139,"studentNo":"201932020","name":"함헌석","phone":"010-8970-8993","sex":"남","email":"ham208@skhu.ac.kr","departmentId":1},      {"id":140,"studentNo":"201933020","name":"류숙정","phone":"010-1326-9036","sex":"여","email":"ryu201@skhu.ac.kr","departmentId":2},      {"id":141,"studentNo":"201932021","name":"정훈세","phone":"010-5426-9109","sex":"남","email":"jeong215@skhu.ac.kr","departmentId":2},      {"id":142,"studentNo":"201932022","name":"박준흥","phone":"010-2673-9155","sex":"남","email":"park222@skhu.ac.kr","departmentId":1},      {"id":143,"studentNo":"201932023","name":"민진구","phone":"010-8443-9236","sex":"남","email":"min238@skhu.ac.kr","departmentId":4},      {"id":144,"studentNo":"201932024","name":"박환인","phone":"010-2515-9284","sex":"남","email":"park249@skhu.ac.kr","departmentId":1},      {"id":145,"studentNo":"201932025","name":"장일정","phone":"010-9508-9385","sex":"남","email":"jang259@skhu.ac.kr","departmentId":3},      {"id":146,"studentNo":"201932026","name":"유옥병","phone":"010-3615-9437","sex":"남","email":"yu263@skhu.ac.kr","departmentId":1},      {"id":147,"studentNo":"201932027","name":"고나진","phone":"010-3603-9475","sex":"남","email":"ko273@skhu.ac.kr","departmentId":1},      {"id":148,"studentNo":"201932028","name":"문재균","phone":"010-3785-9514","sex":"남","email":"moon283@skhu.ac.kr","departmentId":2},      {"id":149,"studentNo":"201932029","name":"문병수","phone":"010-7894-9541","sex":"남","email":"moon297@skhu.ac.kr","departmentId":1},      {"id":150,"studentNo":"201932030","name":"박래용","phone":"010-5871-9549","sex":"남","email":"park305@skhu.ac.kr","departmentId":1},      {"id":151,"studentNo":"202032006","name":"이우병","phone":"010-2301-9550","sex":"남","email":"lee062@skhu.ac.kr","departmentId":2},      {"id":152,"studentNo":"202032007","name":"신정석","phone":"010-7737-9604","sex":"남","email":"sin077@skhu.ac.kr","departmentId":3},      {"id":153,"studentNo":"202032008","name":"오영세","phone":"010-9188-9607","sex":"남","email":"oh089@skhu.ac.kr","departmentId":2},      {"id":154,"studentNo":"202032009","name":"유진하","phone":"010-2988-9622","sex":"여","email":"yu092@skhu.ac.kr","departmentId":3},      {"id":155,"studentNo":"202032010","name":"노명인","phone":"010-3936-9633","sex":"남","email":"no103@skhu.ac.kr","departmentId":4},      {"id":156,"studentNo":"202032011","name":"김조인","phone":"010-6290-9650","sex":"남","email":"kim116@skhu.ac.kr","departmentId":4},      {"id":157,"studentNo":"202032012","name":"김주영","phone":"010-4881-9651","sex":"남","email":"kim124@skhu.ac.kr","departmentId":1},      {"id":158,"studentNo":"202032016","name":"김승현","phone":"010-2742-9784","sex":"남","email":"kim162@skhu.ac.kr","departmentId":2},      {"id":159,"studentNo":"202032017","name":"이룡세","phone":"010-6468-9810","sex":"남","email":"lee176@skhu.ac.kr","departmentId":4},      {"id":160,"studentNo":"202032018","name":"김미윤","phone":"010-1526-9881","sex":"여","email":"kim181@skhu.ac.kr","departmentId":3},      {"id":161,"studentNo":"202032019","name":"유진안","phone":"010-9176-9921","sex":"여","email":"yu199@skhu.ac.kr","departmentId":2},      {"id":162,"studentNo":"202032020","name":"정종현","phone":"010-5222-9960","sex":"남","email":"jeong205@skhu.ac.kr","departmentId":1}]  } |

## API 테스트

### json-server 실행

|  |
| --- |
| json-server --watch students-db.json |

### students 전체 목록

http://localhost:3000/students

### departments 전체 목록

http://localhost:3000/departments

### 학번 오른차순 정렬

http://localhost:3000/students?\_sort=studentNo

### 학번 내림차순 정렬

http://localhost:3000/students?\_sort=studentNo&\_order=DESC

### 학번으로 조회

http://localhost:3000/students?studentNo=201532008

### 학과로 조회

http://localhost:3000/students?departmentId=3

### pagination

http://localhost:3000/students?\_page=3&\_sort=id

id 오름차순으로 3번째 페이지 (한 페이지에 10개 레코드)

http://localhost:3000/students?\_page=3&\_sort=id&\_limit=15

id 오름차순으로 3번째 페이지 (한 페이지에 15개 레코드)

### 등록/수정/삭제

http://localhost:3000/students URL을 POST/PUT/DELETE 요청한다.

전송할 데이터는 JSON 포멧이어야 한다.

POST 요청

http://localhost:3000/students URL

등록할 객체가 param

PUT 요청

http://localhost:3000/students/3 URL id값이 URL에 포함되어야 함

수정할 객체가 param

DELETE 요청

http://localhost:3000/students/3 URL id값이 URL에 포함되어야 함

# axios

## 개요

백엔드 API를 호출하기 위한 라이브러리

### 설치

|  |
| --- |
| npm install axios |

### import

|  |
| --- |
| import axios from 'axios' |

#### get 요청 #1

|  |
| --- |
| axios.get('/students')      .then(response => {        students = response.data;      }) |

promise를 활용한 구현 방법

javascript로 구현한 백엔드 호출 요청은 비동기(asynchronouse)로 실행된다.

(1) axios.get 메소드는 서버 URL을 GET 요청한다. 그리고 즉시 리턴된다.

(2) then 메소드가 호출된다. 이 메소드는 콜백함수를 등록한다. then 메소드도 즉시 리턴된다.

(3) 한참 후에 서버의 응답(response)이 웹브라우저에 도착하면,

then 메소드로 등록한 콜백 함수가 호출된다.

get 요청 #2

|  |
| --- |
| async function test1() {    const response = await axios.get('/students');    const students: Student[] = response.data;  } |

async, await를 활용한 구현 방법

본문에 await 키워드가 있는 함수의 앞 부분에 async 키워드를 붙여야 한다.

async, await 문법을 활용하면, javascript의 비동기 작업을 동기 작업처럼 편하게 구현할 수 있다.

위 코드가 동기 작업이라면,

(1) axios.get 메소드는 즉시 리턴하지 않는다. 서버의 응답이 웹브라우저에 도착하면, 그 때 리턴한다.

이 메소드의 리턴값은, 서버의 응답이다.

(2) 그 다음 줄이 실행된다.

위와 같이 axios.get 메소드 호출이 동기(synchronous) 호출인 것처럼 구현할 수 있다.

그러나 여전히 axios.get 메소드는 비동기 실행된다.

그렇지만 마치 동기인 것처럼 위와 같이 구현해도, javascript 엔진이 잘 실행해 준다.

## test\_axios1.ts

|  |
| --- |
| import axios from 'axios'  type Student = {    id: number,    studentNo: string,    name: string,    phone: string,    email: string,    sex: string,    departmentId: number  }  axios.defaults.baseURL = 'http://localhost:3000';  export function test1() {    let students: Student[] = [];    axios.get('/students')      .then(response => {        students = response.data;        console.log('test1', students);      })  }  export function test2() {    let students: Student[];    let student: Student;    axios.get('/students')      .then(response => {        students = response.data;        return students[0].id; // 이전의 then 콜백 함수의 리턴 값이      }) // 다음 then 콜백 함수의 파라미터로 전달된다.      .then(id => {        axios.get('/students/' + id)          .then(response => {            student = response.data;            console.log('test2', student);          })      })  }  export function test3(id: number) {    let student: Student;    axios.get('/students/' + id)      .then(response => {        student = response.data;        console.log('test3', student);      })      .catch(error => { // 에러가 발생하면, catch 콜백 함수가 호출된다.        console.log('test3', error);      })  } |

### App.tsx

|  |
| --- |
| import { useEffect } from "react";  import { test1, test2, test3 } from './test\_axios1';  function App() {    useEffect(() => {      test1();      test2();      test3(1);      test3(400);    });    return (      <h1>axios 테스트</h1>    )  }  export default App |

위 코드와 동일한 기능을, async await 문법을 활용하면 다음과 같이 간결하게 구현할 수 있다.

## test\_axios2.ts

|  |
| --- |
| import axios from 'axios'  type Student = {    id: number,    studentNo: string,    name: string,    phone: string,    email: string,    sex: string,    departmentId: number  }  axios.defaults.baseURL = 'http://localhost:3000';  export async function test1() {    const response = await axios.get('/students');    const students: Student[] = response.data;    console.log('test1', students);  }  export async function test2() {    const response = await axios.get('/students');    const students: Student[] = response.data;    const id: number = students[0].id;    const student: Student = await axios.get('/students/' + id);    console.log('test2', student);  }  export async function test3(id: number) {    try {      const response = await axios.get('/students/' + id);      const student: Student = response.data;      console.log('test3', student);    }    catch (error) {        console.log('test3', error);    }  } |

### App.tsx

|  |
| --- |
| import { useEffect } from "react";  import { test1, test2, test3 } from './test\_axios2';  function App() {    useEffect(() => {      test1();      test2();      test3(1);      test3(400);    });    return (      <h1>axios 테스트</h1>    )  }  export default App |

## test\_axios3.ts

|  |
| --- |
| import axios from 'axios'  type Student = {    id: number,    studentNo: string,    name: string,    phone: string,    email: string,    sex: string,    departmentId: number  }  axios.defaults.baseURL = 'http://localhost:3000';  export async function test1() {    const response0 = await axios.get('/students/1');    const student0: Student = response0.data;    console.log('test1', student0);    const student1: Student = {...student0, name: '홍길동'};    await axios.put('/students/1', student1);    const response2 = await axios.get('/students/1');    console.log('test1', response2.data);    await axios.put('/students/1', student0);    const response3 = await axios.get('/students/1');    console.log('test1', response3.data);  }  export async function test2() {    const student1: Student = { id: 0, studentNo: '201014099', name: '임꺽정',                                phone: '111', email: 'h@a.c', sex: '남', departmentId: 1 };    await axios.post('/students', student1);    const response1 = await axios.get('/students');    const students1 = response1.data;    const length = students1.length;    console.log('test2', length, students1[length-1]);    await axios.delete('/students/' + students1[length-1].id);    const response2 = await axios.get('/students');    console.log('test2', response2.data.length);  } |

### App.tsx

|  |
| --- |
| import { useEffect } from "react";  import { test1, test2 } from './test\_axios3';  function App() {    useEffect(() => {      test1();      test2();    });    return (      <h1>axios 테스트</h1>    )  }  export default App |

### index.tsx

|  |
| --- |
| import React from 'react';  import ReactDOM from 'react-dom/client';  import './index.css';  import App from './App';  import reportWebVitals from './reportWebVitals';  const root = ReactDOM.createRoot(    document.getElementById('root') as HTMLElement  );  root.render(    //<React.StrictMode>      <App />    //</React.StrictMode>  );  // If you want to start measuring performance in your app, pass a function  // to log results (for example: reportWebVitals(console.log))  // or send to an analytics endpoint. Learn more: https://bit.ly/CRA-vitals  reportWebVitals(); |

<React.StrictMode>

개발 서버에서 실행할 때, deprecated 기능을 사용하고 있지 않은지 자동으로 검사해준다.

그런데 이 기능 때문에, 컴포넌트들이 두 번씩 렌더링된다.

test\_axios3.ts 테스트 코드가 두 번씩 호출되면, 등록 수정 삭제 요청이 중복되면서 문제가 생길 수 있다.

위와 같이 주석으로 막자.