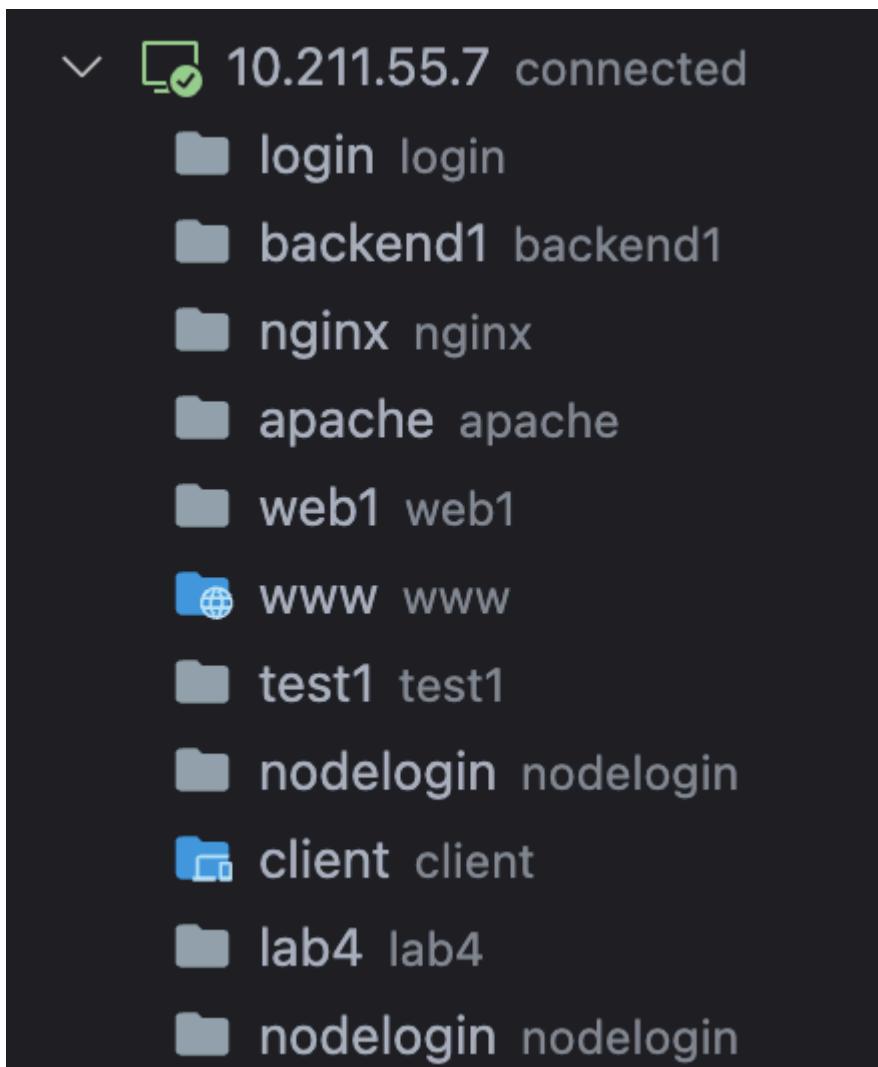


STEP 6

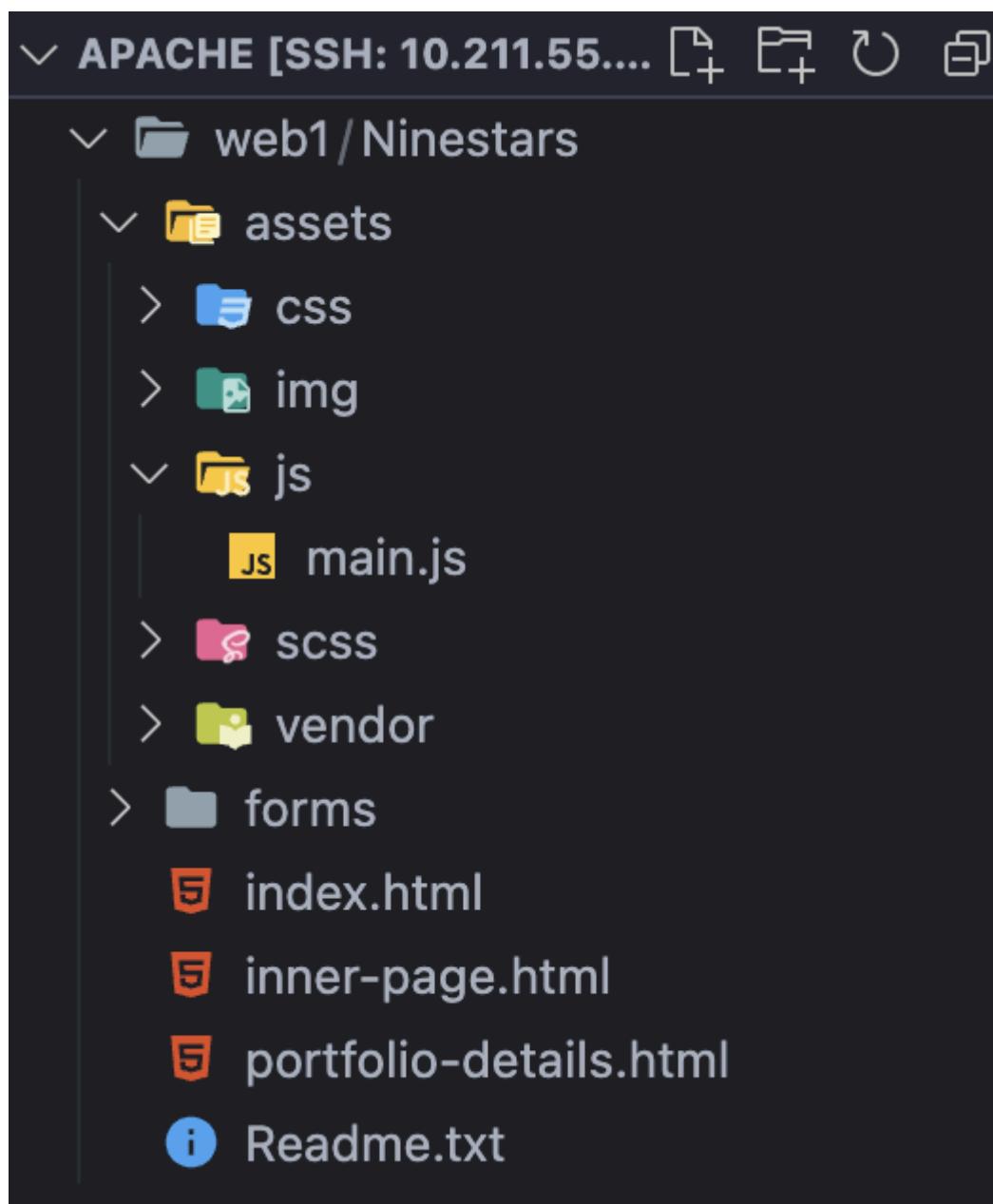
เชื่อม vscode เข้ากับ webserver



The screenshot shows the VS Code interface with a file tree on the left. A connection status bar at the top indicates "10.211.55.7 connected". The file tree lists several folders:

- login login
- backend1 backend1
- nginx nginx
- apache apache
- web1 web1
- www www
- test1 test1
- nodelogin nodelogin
- client client
- lab4 lab4
- nodelogin nodelogin

```
sudo chown -R $USER:$USER /var/www (ให้ user ใช้โฟล์เดอร์ www)
cd /var/www/ (เข้าไปในโฟล์เดอร์ lab4)
mkdir apache (สร้างไฟล์ server)
cd apache (เข้าไปในโฟล์เดอร์ server)
mkdir web1 (สร้างไฟล์ server)
cd web1 (เข้าไปในโฟล์เดอร์ server)
เข้าไปในไฟล์ web1 ของ vscode และนำ source เข้าไปใส่
```



```
cd /etc/apache2/sites-available/ (เข้าไปในโฟล์เดอร์ sites-available apache2)
sudo cp 000-default.conf web1.conf (คัดลอกไฟล์ default ของ apache2)
sudo nano web1.conf (เข้าไฟล์ web1)
```

```
GNU nano 6.2
<VirtualHost *:80>

    ServerName web1
    ServerAlias web1.backend.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/apache/web1
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

</VirtualHost>
```

ต่อมาให้ไข้คำสั่ง

```
sudo a2ensite web1 (enable web1)
systemctl reload apache2 (restart apache2)
เข้าไปที่ terminal : sudo nano /etc/hosts เพื่อเข้าไปเพิ่ม 10.211.55.7 web1.backend1.com
```

```
● ● ● admin — pico - sudo — 80x24
UW PICO 5.09          File: /etc/hosts

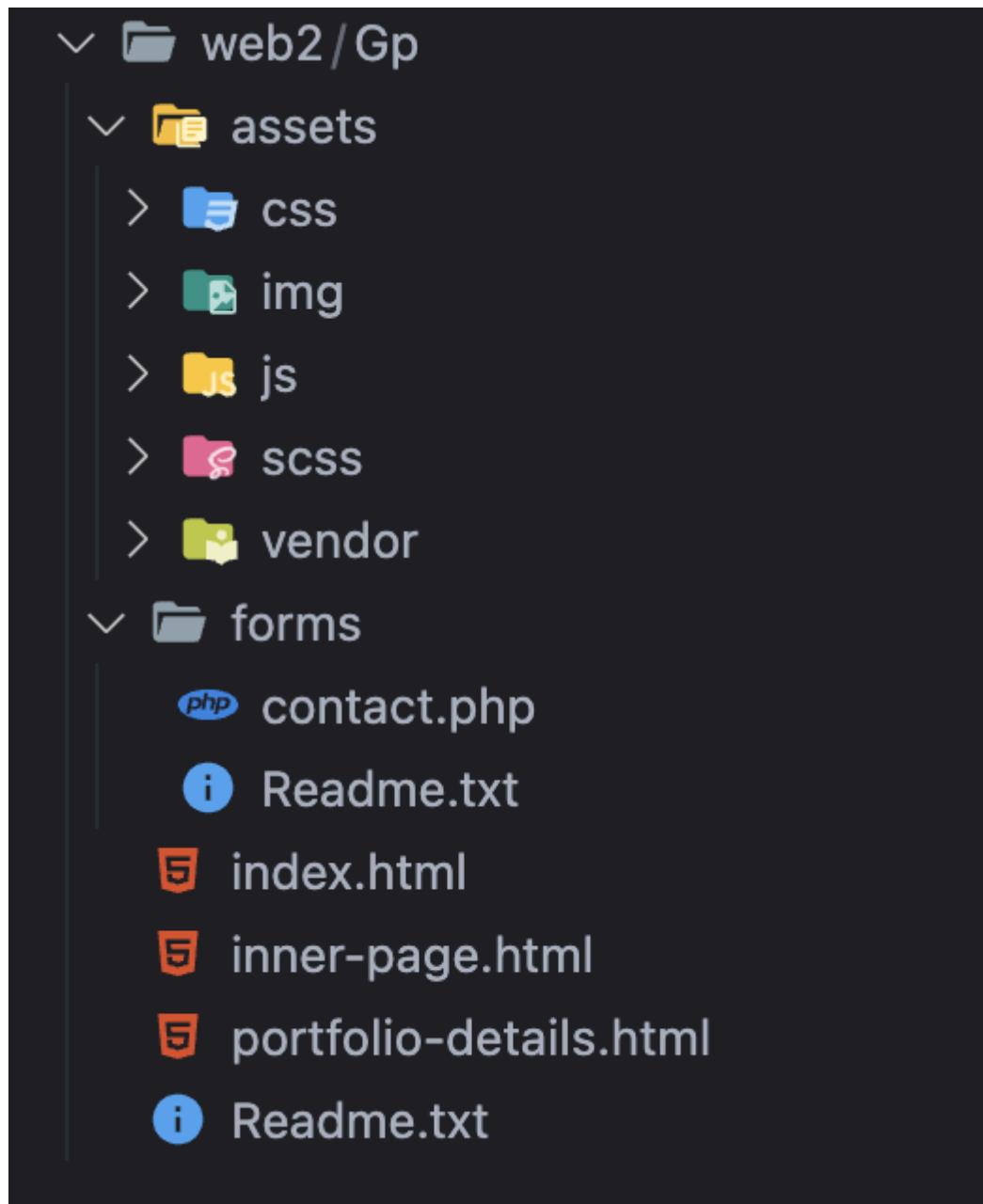
## 
# Host Database
#
# localhost is used to configure the loopback interface
# when the system is booting.  Do not change this entry.
##
127.0.0.1      localhost
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7    myapp.se-rmutil.net
10.211.55.7    expressjs-example.se-rmutil.net
10.211.55.7    my-react-app.se-rmutil.net ubuntu-next-app.se-rmutil.net
10.211.55.7    nodelogin.se-rmutil.net
10.211.55.7    weblogin.se-rmutil.net
10.211.55.7    web1.backend1.com
10.211.55.7    web2.backend1.com
10.211.55.7    react1.backend1.com
10.211.55.7    react2.backend1.com
10.211.55.7    login.backend1.com
```

web.1backend1.com



**Voluptatem dignissimos provident
quasi**

```
cd /var/www/  
mkdir nginx (สร้างไฟล์ nginx)  
cd nginx (เข้าไปในโฟล์เดอร์ nginx)  
mkdir web2 (สร้างไฟล์ web2)  
cd web2 (เข้าไปในโฟล์เดอร์ web2)  
เข้าไปในไฟล์ web2 ของ vscode และนำ source เข้าไปใส่
```



```
cd /etc/nginx/sites-available (เข้าไปยังโฟล์เดอร์)
sudo cp default web2 (คัดลอกไฟล์มา)
sudo nano web2 (เข้าไปยังไฟล์เพื่อแก้ไข)
```

```
GNU nano 6.2
server {
    listen 81 default_server;
    listen [::]:81 default_server;

    server_name web2.backend.com;

    root /var/www/nginx/web2/Gp;

    index index.html index.htm index.nginx-debian.html;

    location / {
        try_files $uri $uri/ =404;
    }
}
```

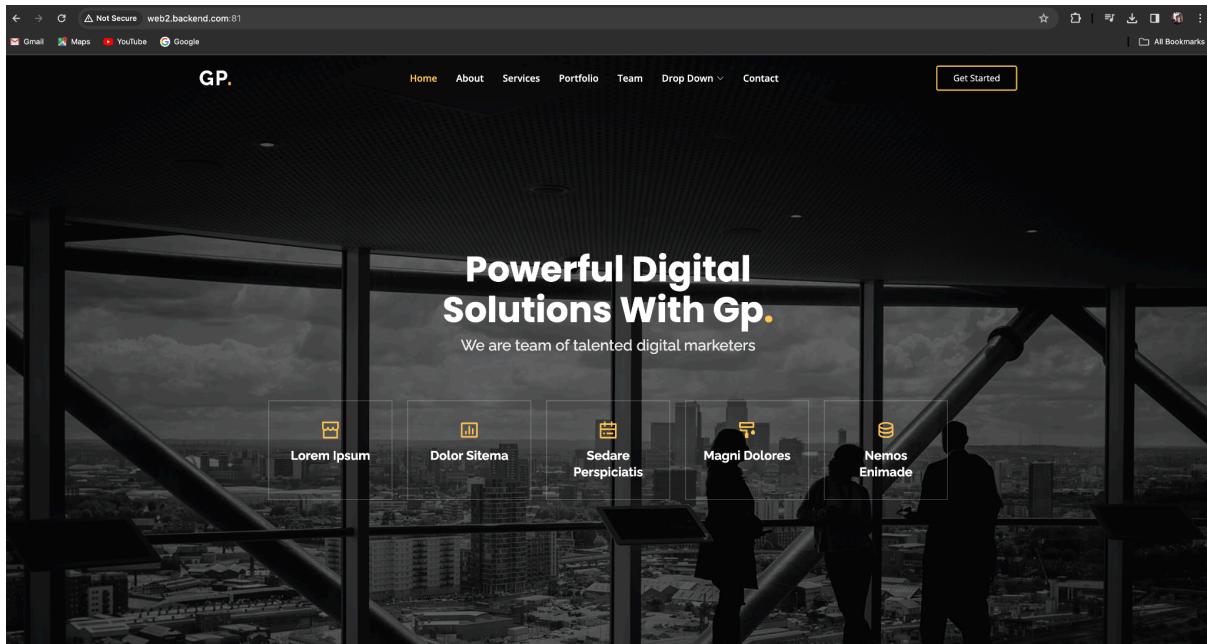
```
sudo ufw allow 81 (อนุญาต port 81)
sudo systemctl restart nginx (ทำการ restart nginx)
เข้าไปที่ terminal : sudo nano /etc/hosts เพื่อเข้าไปเพิ่ม 10.211.55.7 web2.backend1.com
```

```
● ● ● admin — pico - sudo — 80x24
UW PICO 5.09 File: /etc/hosts

##
# Host Database
#
# localhost is used to configure the loopback interface
# when the system is booting. Do not change this entry.
##
127.0.0.1      localhost
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7    myapp.se-rmutil.net
10.211.55.7    expressjs-example.se-rmutil.net
10.211.55.7    my-react-app.se-rmutil.net ubuntu-next-app.se-rmutil.net
10.211.55.7    nodelogin.se-rmutil.net
10.211.55.7    weblogin.se-rmutil.net
10.211.55.7    web1.backend.com
10.211.55.7    web2.backend.com
10.211.55.11   web1.midterm-engse202-018.com web2.midterm-engse202-018.com
10.211.55.11   react1.midterm-engse202-018.com react2.midterm-engse202.com

^G Get Help  ^O WriteOut  ^R Read File  ^Y Prev Pg   ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where is  ^V Next Pg   ^U UnCut Text^T To Spell
```

web2.backend1.com



STEP 7 Download React template

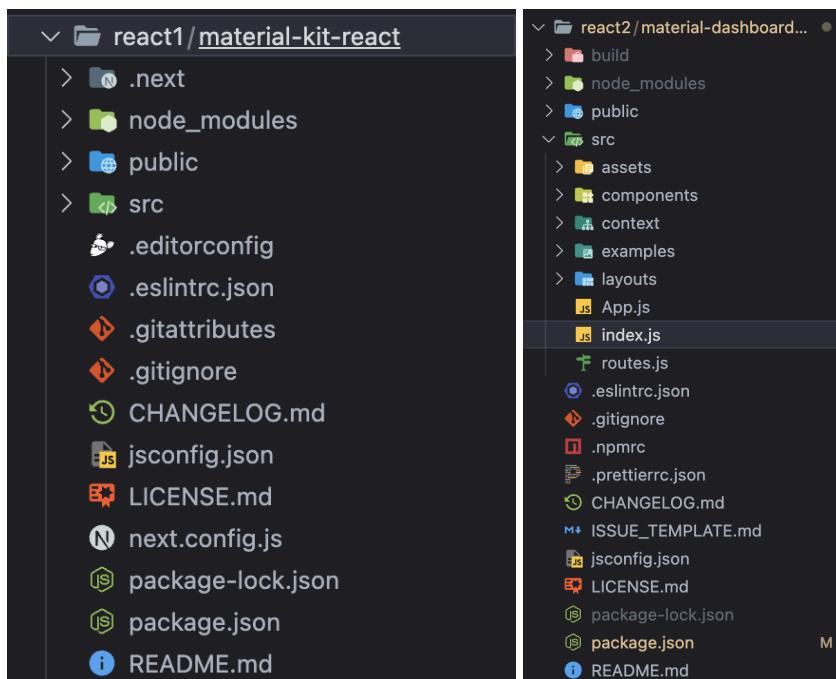
STEP 8

cd /var/www/nginx (เข้าไปในโฟลเดอร์ nginx)

mkdir react1 (สร้างไฟล์ react1)

mkdir react2 (สร้างไฟล์ react2)

เข้าไปในไฟล์ react1 และ react2 ของ vscode และนำ sourcecode เข้าไปใส่



cd /etc/nginx/sites-available (เข้าไปยังโฟล์เดอร์)

sudo cp default react1 (คัดลอกไฟล์มา)

sudo nano react1 (เข้าไปยังไฟล์เพื่อแก้ไข)

```
GNU nano 6.2                                         react1
server {
    listen 80;
    listen [::]:80;
    server_name react1.backend1.com;

    location / {
        proxy_pass http://127.0.0.1:3010; # !!! - change to your app port
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }

}
```

```
GNU nano 6.2                                         react2
server {
    listen 80;
    listen [::]:80;
    server_name react2.backend1.com;

    location / {
        proxy_pass http://127.0.0.1:3011; # !!! - change to your app port
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }

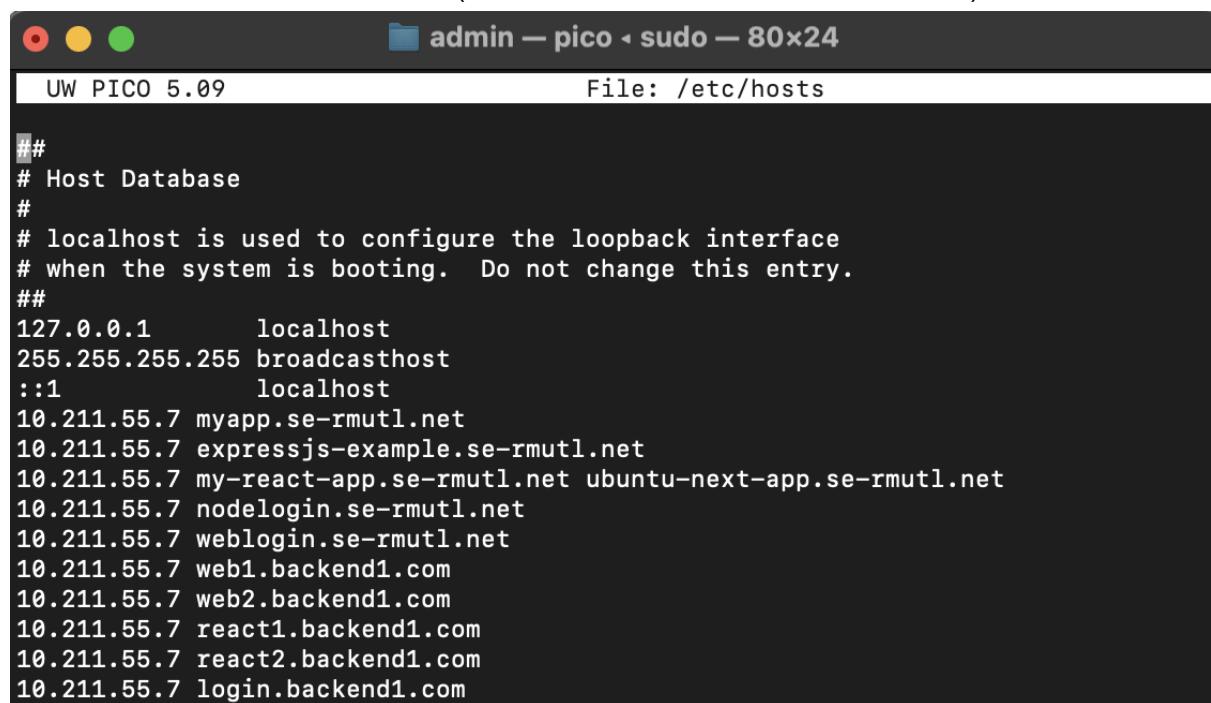
}
```

sudo ufw allow 3010 (ອນໝາດີ port 3010)

sudo ufw allow 3011 (ອນໝາດີ port 3011)

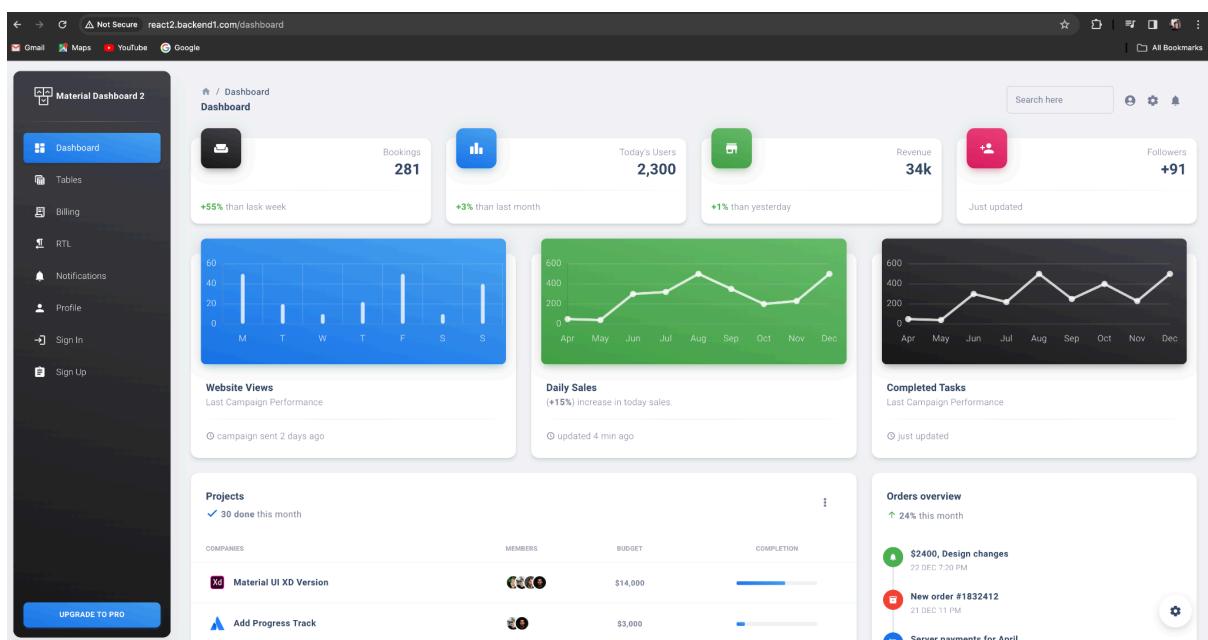
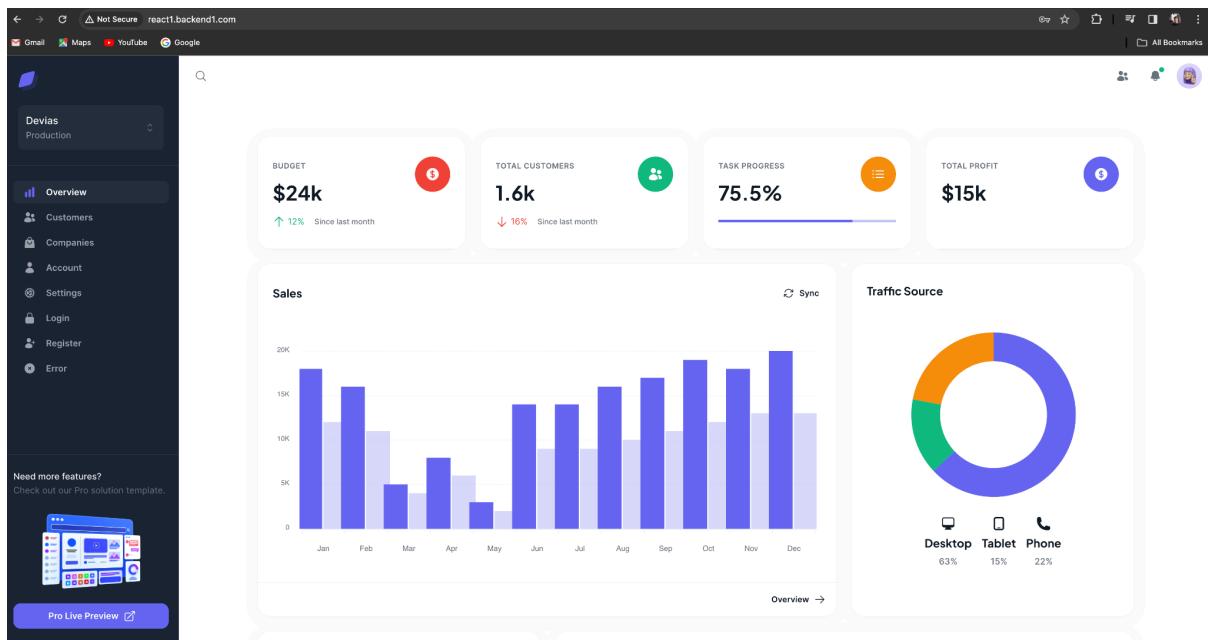
To	Action	From
--	-----	----
OpenSSH	ALLOW	Anywhere
Apache	ALLOW	Anywhere
Nginx Full	ALLOW	Anywhere
3333	ALLOW	Anywhere
3000	ALLOW	Anywhere
3001	ALLOW	Anywhere
3002	ALLOW	Anywhere
3306/tcp	ALLOW	Anywhere
3003	ALLOW	Anywhere
3004	ALLOW	Anywhere
4000	ALLOW	Anywhere
81	ALLOW	Anywhere
3010	ALLOW	Anywhere
3011	ALLOW	Anywhere
3012	ALLOW	Anywhere
4040	ALLOW	Anywhere
OpenSSH (v6)	ALLOW	Anywhere (v6)
Apache (v6)	ALLOW	Anywhere (v6)
Nginx Full (v6)	ALLOW	Anywhere (v6)
3333 (v6)	ALLOW	Anywhere (v6)
3000 (v6)	ALLOW	Anywhere (v6)
3001 (v6)	ALLOW	Anywhere (v6)
3002 (v6)	ALLOW	Anywhere (v6)
3306/tcp (v6)	ALLOW	Anywhere (v6)
3003 (v6)	ALLOW	Anywhere (v6)
3004 (v6)	ALLOW	Anywhere (v6)
4000 (v6)	ALLOW	Anywhere (v6)
81 (v6)	ALLOW	Anywhere (v6)
3010 (v6)	ALLOW	Anywhere (v6)
3011 (v6)	ALLOW	Anywhere (v6)
3012 (v6)	ALLOW	Anywhere (v6)
4040 (v6)	ALLOW	Anywhere (v6)

10.211.55.7 react1.backend1.com
10.211.55.7 react2.backend2.com (edit in terminal -> sudo nano /etc/hosts)



```
##  
# Host Database  
#  
# localhost is used to configure the loopback interface  
# when the system is booting. Do not change this entry.  
##  
127.0.0.1      localhost  
255.255.255.255 broadcasthost  
::1            localhost  
10.211.55.7    myapp.se-rmutl.net  
10.211.55.7    expressjs-example.se-rmutl.net  
10.211.55.7    my-react-app.se-rmutl.net ubuntu-next-app.se-rmutl.net  
10.211.55.7    nodelogin.se-rmutl.net  
10.211.55.7    weblogin.se-rmutl.net  
10.211.55.7    web1.backend1.com  
10.211.55.7    web2.backend1.com  
10.211.55.7    react1.backend1.com  
10.211.55.7    react2.backend1.com  
10.211.55.7    login.backend1.com
```

TEST



STEP 9

แก้พอร์ต server ให้เป็น 4040 จากนั้น

The screenshot shows the Visual Studio Code interface with the following details:

- Explorer View:** Shows the project structure with files: index.js, node_modules/index.js, package-lock.json, and package.json.
- Code Editor:** The main editor area displays the content of index.js. The code is a Node.js application that handles POST requests to '/register' to insert data into a MySQL database named 'users'. It includes error handling and logging.
- Terminal:** At the bottom left, it shows the connection information: SSH: 10.211.56.9.
- Status Bar:** At the bottom right, it shows the file path as index.js, line 1, column 1, and the encoding as UTF-8.

```
index.js
52     } else
53     |     res.send({ message: "Wrong username/password combination!" });
54   }
55
56   );
57 );
58 );
59 );
60
61 app.post('/register', (req, res) => {
62   let username = req.body.username;
63   let password = req.body.password;
64
65
66   console.log("body: "+ JSON.stringify(req.body));
67
68
69   console.log("username: "+username);
70   console.log("password: "+password);
71
72
73 db.execute(
74   "INSERT INTO users (username, password) VALUES (?,?)",
75   [username, password],
76   (err, result) => {
77     if (err) {
78       if (err) {
79         res.send({ err: err });
80       }
81       res.send(result);
82     }
83   });
84 );
85 );
86
87
88 app.listen(4040, () => {
89   console.log("running server");
90 });
91
```

`sudo ufw allow 4040` เพื่อนำถ่ายดิ port 4040

To	Action	From
--	-----	----
OpenSSH	ALLOW	Anywhere
Apache	ALLOW	Anywhere
Nginx Full	ALLOW	Anywhere
3333	ALLOW	Anywhere
3000	ALLOW	Anywhere
3001	ALLOW	Anywhere
3002	ALLOW	Anywhere
3306/tcp	ALLOW	Anywhere
3003	ALLOW	Anywhere
3004	ALLOW	Anywhere
4000	ALLOW	Anywhere
81	ALLOW	Anywhere
3010	ALLOW	Anywhere
3011	ALLOW	Anywhere
3012	ALLOW	Anywhere
4040	ALLOW	Anywhere
OpenSSH (v6)	ALLOW	Anywhere (v6)
Apache (v6)	ALLOW	Anywhere (v6)
Nginx Full (v6)	ALLOW	Anywhere (v6)
3333 (v6)	ALLOW	Anywhere (v6)
3000 (v6)	ALLOW	Anywhere (v6)
3001 (v6)	ALLOW	Anywhere (v6)
3002 (v6)	ALLOW	Anywhere (v6)
3306/tcp (v6)	ALLOW	Anywhere (v6)
3003 (v6)	ALLOW	Anywhere (v6)
3004 (v6)	ALLOW	Anywhere (v6)
4000 (v6)	ALLOW	Anywhere (v6)
81 (v6)	ALLOW	Anywhere (v6)
3010 (v6)	ALLOW	Anywhere (v6)
3011 (v6)	ALLOW	Anywhere (v6)
3012 (v6)	ALLOW	Anywhere (v6)
4040 (v6)	ALLOW	Anywhere (v6)

sudo nano backend2 เพิ่ม server_name api.backend2.com และแก้ไขPortให้เป็น4040

```
GNU nano 6.2                                         backend2 *
server {
    listen 80;
    listen [::]:80;
    server_name api.backend2.com;

    location / {
        proxy_pass http://127.0.0.1:4040; # !!! - change to your app port
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }

}
```

เพิ่มโดเมน 10.211.55.7 api.backend2.com

```
● ● ● admin — pico — sudo — 80x24
UW PICO 5.09                                         File: /etc/hosts
10.211.55.7 expressjs-example.se-rmutl.net
10.211.55.7 my-react-app.se-rmutl.net ubuntu-next-app.se-rmutl.net
10.211.55.7 nodelogin.se-rmutl.net
10.211.55.7 weblogin.se-rmutl.net
10.211.55.7 web1.backend1.com
10.211.55.7 web2.backend1.com
10.211.55.7 react1.backend1.com
10.211.55.7 react2.backend1.com
10.211.55.7 login.backend1.com
10.211.55.9 api.backend2.com
10.211.55.11 web1.midterm-engse202-018.com web2.midterm-engse202-018.com
10.211.55.11 react1.midterm-engse202-018.com react2.midterm-engse202.com
```

TEST

- devuser@backend2-66543210018:/var/www/nginx/server\$ node index.js
running server
Hello from API
[]

STEP 10

GET

The screenshot shows the Postman application interface. At the top, there is a header bar with a search field containing "http://api.backend2.com:4040", a "+" button, and three dots. Below the header is a toolbar with a "HTTP" icon, a "Save" button, and a "Cancel" button. The main workspace has a "GET" method selected and the URL "http://api.backend2.com:4040". The "Params" tab is active, showing a table for "Query Params" with one row: "Key" and "Value". Other tabs include "Authorization", "Headers (6)", "Body", "Pre-request Script", "Tests", "Settings", and "Cookies". Below the table, there are tabs for "Body", "Cookies", "Headers (10)", and "Test Results". The "Test Results" tab is selected, showing a status message "Sending request...". In the body preview area, there is a pre-formatted HTML response:

```
1 <!DOCTYPE html>
2 <html lang="en">
3
4   <head>
5     <meta charset="utf-8">
6     <title>Error</title>
7   </head>
8
9   <body>
10    <pre>Cannot POST /</pre>
11  </body>
```

The status bar at the bottom indicates a 404 Not Found error with 10 ms response time and 466 B size.

POST

The screenshot shows the Postman application interface. At the top, there is a header bar with the URL "POST http://api.backend2.com" and a "Save" button. Below the header, the main interface is visible, divided into several sections:

- Request Section:** Shows the method "POST" and the URL "http://api.backend2.com:4040". There is a "Send" button and a dropdown menu.
- Params Tab:** Active tab, showing a table for "Query Params". It has one row with "Key" and "Value" columns, both containing "Key". A "Bulk Edit" button is at the bottom right.
- Body Tab:** Active tab, showing the response body. The response is a simple HTML page with the following content:

```
1 <!DOCTYPE html>
2 <html lang="en">
3
4   <head>
5     <meta charset="utf-8">
6     <title>Error</title>
7   </head>
8
9   <body>
10    <pre>Cannot POST /</pre>
11 </body>
```
- Headers Tab:** Shows 10 headers.
- Test Results Tab:** Shows the status 404 Not Found, 9 ms, 466 B.
- Bottom Tools:** Includes icons for copy, search, and help.

STEP 11

จากนั้นแก้ไข นำ source code เข้ามา
client/src/App.js แก้พอร์ตเป็น 4040

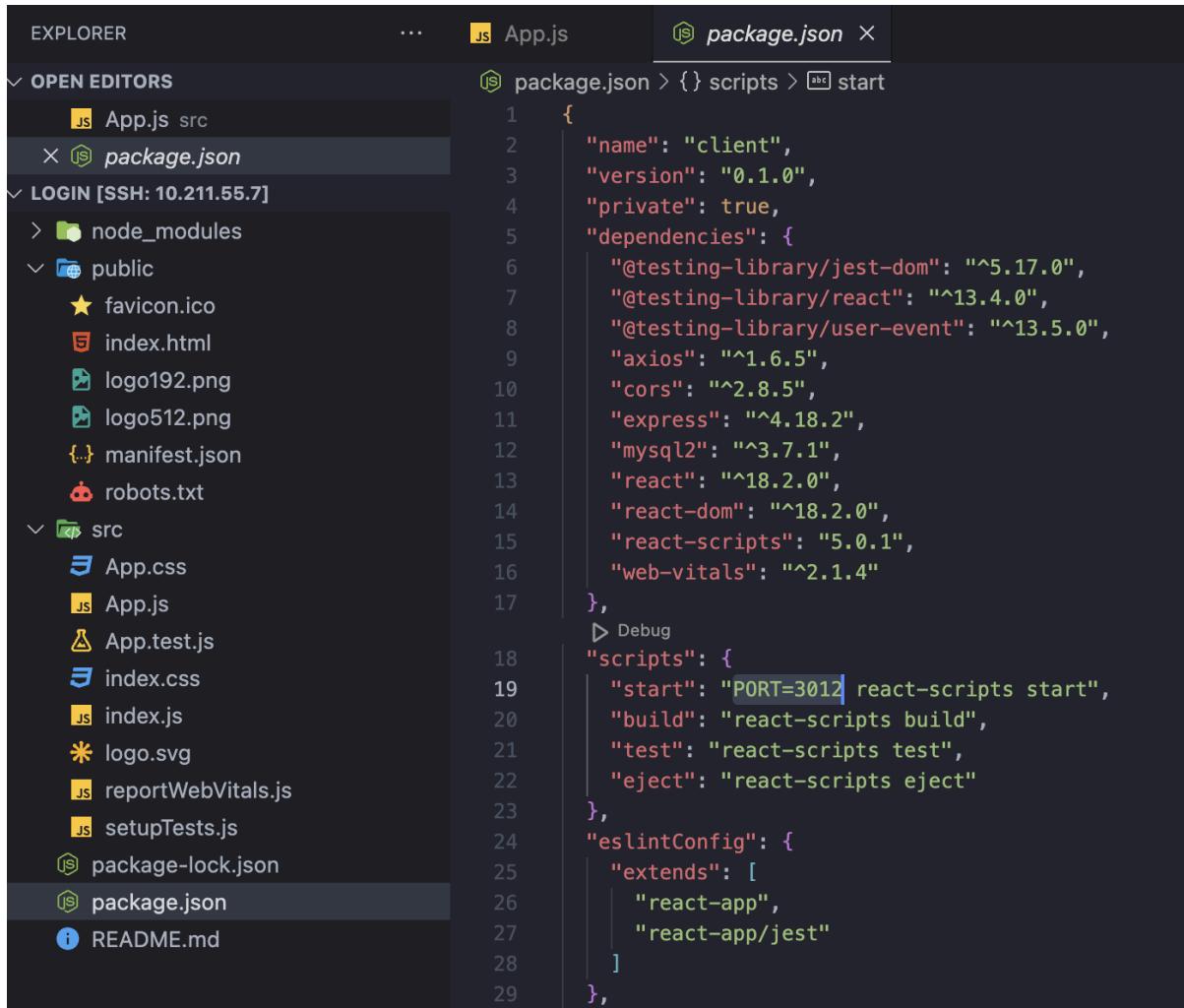
The screenshot shows a terminal window with a file tree on the left and the content of `App.js` on the right.

File Tree:

- OPEN EDITORS:
 - X `App.js` src
 - `index.js` src
- LOGIN [SSH: 10.211.55.7]:
 - > node_modules
 - > public
 - favicon.ico
 - index.html
 - logo192.png
 - logo512.png
 - manifest.json
 - robots.txt
 - > src
 - App.css
 - App.js**
 - App.test.js
 - index.css
 - index.js
 - logo.svg
 - reportWebVitals.js
 - setupTests.js

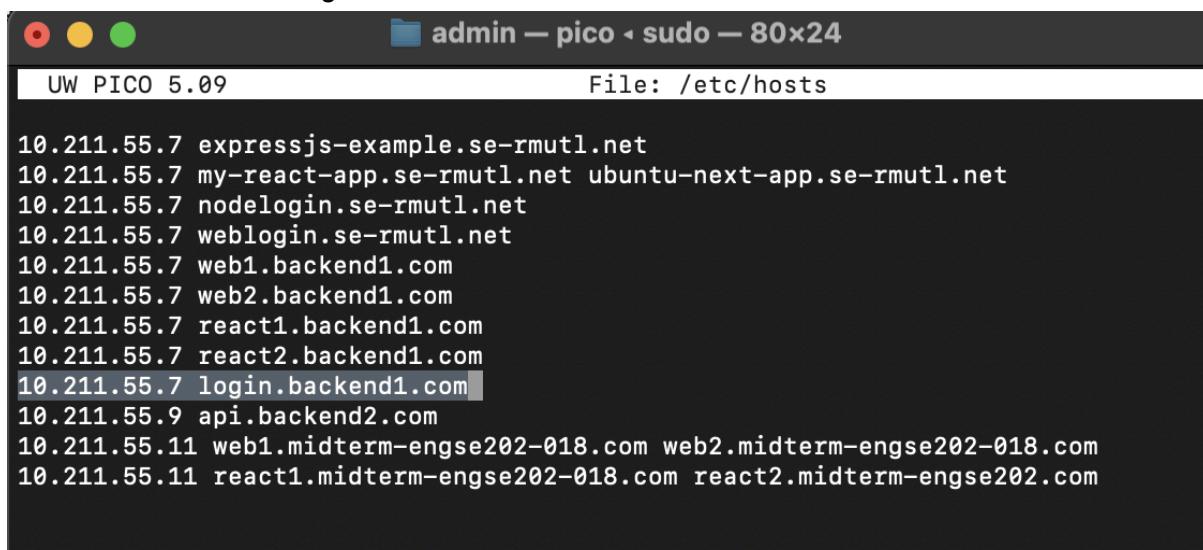
```
src > App.js > App > register
1 import React, { useState } from "react";
2 import Axios from 'axios';
3 import './App.css';
4 function App() {
5   const [usernameReg, setUsernameReg] = useState("");
6   const [passwordReg, setPasswordReg] = useState ("");
7   const [username, setUsername] = useState("");
8   const [password, setPassword] = useState ("");
9   const [loginStatus, setLoginStatus] = useState("");
10  const register = () => {
11    Axios.post("http://api.backend2.com:4040/register", {
12      username: usernameReg,
13      password: passwordReg,
14    }).then((response) => {
15      console.log(response);
16
17      if (!response.data.err) {
18        setLoginStatus("'" +usernameReg + "' was inserted.");
19      } else {
20        setLoginStatus(response.data.err.sqlMessage);
21      }
22
23
24
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```

ไปที่ไฟล์ package.json เพิ่มพอร์ต 3012 เข้าไป



```
1 {  
2   "name": "client",  
3   "version": "0.1.0",  
4   "private": true,  
5   "dependencies": {  
6     "@testing-library/jest-dom": "^5.17.0",  
7     "@testing-library/react": "^13.4.0",  
8     "@testing-library/user-event": "13.5.0",  
9     "axios": "^1.6.5",  
10    "cors": "^2.8.5",  
11    "express": "^4.18.2",  
12    "mysql2": "3.7.1",  
13    "react": "^18.2.0",  
14    "react-dom": "18.2.0",  
15    "react-scripts": "5.0.1",  
16    "web-vitals": "2.1.4"  
17  },  
18  ▷ Debug  
19  "scripts": {  
20    "start": "PORT=3012 react-scripts start",  
21    "build": "react-scripts build",  
22    "test": "react-scripts test",  
23    "eject": "react-scripts eject"  
24  },  
25  "eslintConfig": {  
26    "extends": [  
27      "react-app",  
28      "react-app/jest"  
29    ]  
},
```

เพิ่มโดเมน 10.211.55.4 login.backend1.com

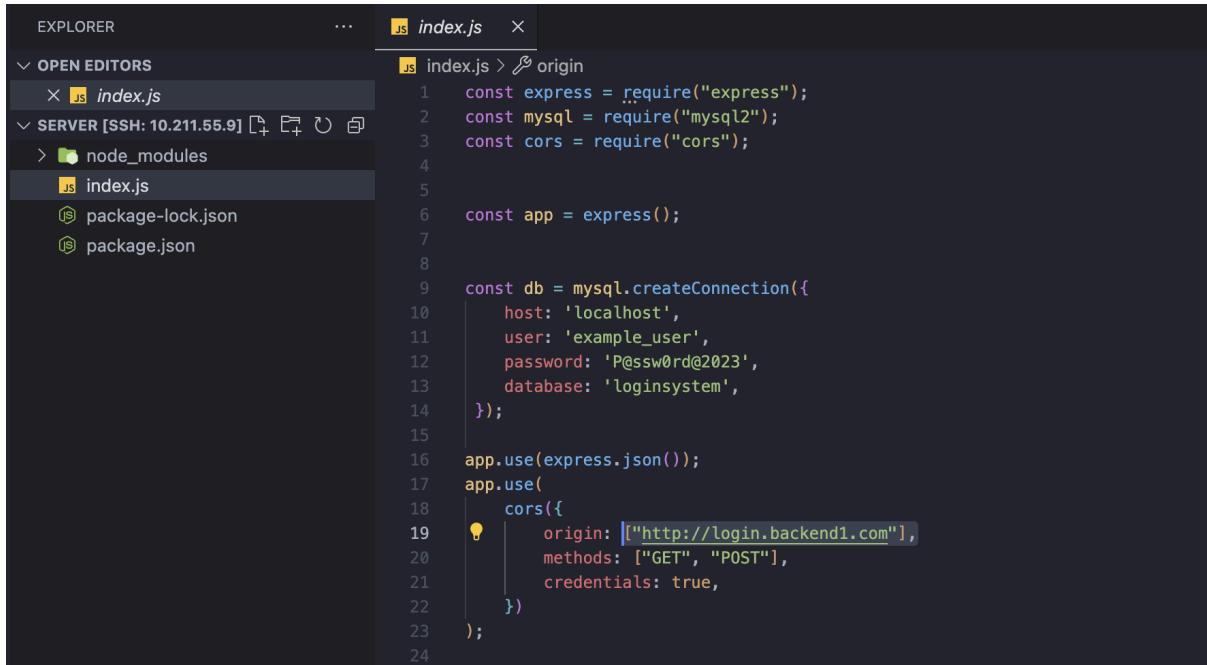


```
UW PICO 5.09 File: /etc/hosts  
  
10.211.55.7 expressjs-example.se-rmutil.net  
10.211.55.7 my-react-app.se-rmutil.net ubuntu-next-app.se-rmutil.net  
10.211.55.7 nodelogin.se-rmutil.net  
10.211.55.7 weblogin.se-rmutil.net  
10.211.55.7 web1.backend1.com  
10.211.55.7 web2.backend1.com  
10.211.55.7 react1.backend1.com  
10.211.55.7 react2.backend1.com  
10.211.55.7 login.backend1.com  
10.211.55.9 api.backend2.com  
10.211.55.11 web1.midterm-engse202-018.com web2.midterm-engse202-018.com  
10.211.55.11 react1.midterm-engse202-018.com react2.midterm-engse202.com
```

```
npm install express --save ติดตั้ง express  
npm install --save mysql2 ติดตั้ง mysql2  
npm i --save cors ติดตั้ง cors
```

```
devuser@backend1-66543210018:/var/www/nginx/login$ npm install express --save  
up to date, audited 1567 packages in 2s  
  
254 packages are looking for funding  
  run `npm fund` for details  
  
8 vulnerabilities (2 moderate, 6 high)  
  
To address all issues (including breaking changes), run:  
  npm audit fix --force  
  
Run `npm audit` for details.  
devuser@backend1-66543210018:/var/www/nginx/login$ npm install --save mysql2  
  
changed 1 package, and audited 1567 packages in 2s  
  
254 packages are looking for funding  
  run `npm fund` for details  
  
8 vulnerabilities (2 moderate, 6 high)  
  
To address all issues (including breaking changes), run:  
  npm audit fix --force  
  
Run `npm audit` for details.  
devuser@backend1-66543210018:/var/www/nginx/login$ npm i --save cors  
  
up to date, audited 1567 packages in 2s  
  
254 packages are looking for funding  
  run `npm fund` for details  
  
8 vulnerabilities (2 moderate, 6 high)  
  
To address all issues (including breaking changes), run:  
  npm audit fix --force  
  
Run `npm audit` for details.  
devuser@backend1-66543210018:/var/www/nginx/login$ █
```

ให้รันแบบโดเมนโดยเข้าไปแก้พอร์ตใน server/index.js
แก้ไขเป็น origin: ["http://login.backend1.com"],



```
const express = require("express");
const mysql = require("mysql2");
const cors = require("cors");

const app = express();

const db = mysql.createConnection({
  host: 'localhost',
  user: 'example_user',
  password: 'P@ssw0rd@2023',
  database: 'loginsystem',
});

app.use(express.json());
app.use(
  cors({
    origin: ["http://login.backend1.com"],
    methods: ["GET", "POST"],
    credentials: true,
  })
);
```

TEST



Registration

Username: 66543210018
password: inax
Register

Login

Username...
Password... | Login

'66543210018' was inserted.

The screenshot shows a browser window with the URL `Not Secure login.backend1.com`. On the left, there is an SSH terminal window titled `server [SSH: 10.211.56.9]` displaying the contents of `index.js`. The code includes a `cors` middleware and a `POST` route for logging in. On the right, there is a registration form with fields for `username` and `password`, and a `Register` button. Below it is a login form with fields for `username` and `password`, and a `Login` button.

```
const express = require('express');
const cors = require('cors');
const db = require('./db');

const app = express();
app.use(express.json());
app.use(cors());
app.post('/login', (req, res) => {
  const origin = "http://login.backend1.com";
  const methods = ["GET", "POST"];
  const credentials = true;
  res.set('Access-Control-Allow-Origin', origin);
  res.set('Access-Control-Allow-Methods', methods);
  res.set('Access-Control-Allow-Credentials', credentials);
  let username = req.body.username;
  let password = req.body.password;
  console.log("body: " + JSON.stringify(req.body));
  res.send(`'${username}' was logged in.`);
});

app.get('/', (req, res) => {
  console.log("Hello from API!");
});

app.listen(3001, () => {
  console.log(`Server is running on port 3001`);
});
```

The screenshot shows a browser window with the URL `Not Secure login.backend1.com`. On the left, there is an SSH terminal window titled `server [SSH: 10.211.56.9]` displaying the contents of `index.js`. The code includes a `cors` middleware and a `POST` route for logging in. On the right, there is a registration form with fields for `username` and `password`, and a `Register` button. Below it is a login form with fields for `username` and `password`, and a `Login` button. A message `'test' was logged in.` is displayed below the login form.

```
const express = require('express');
const cors = require('cors');
const db = require('./db');

const app = express();
app.use(cors());
app.post('/login', (req, res) => {
  const origin = "http://login.backend1.com";
  const methods = ["GET", "POST"];
  const credentials = true;
  res.set('Access-Control-Allow-Origin', origin);
  res.set('Access-Control-Allow-Methods', methods);
  res.set('Access-Control-Allow-Credentials', credentials);
  let username = req.body.username;
  let password = req.body.password;
  console.log("body: " + JSON.stringify(req.body));
  res.send(`'${username}' was logged in.`);
});

app.get('/', (req, res) => {
  console.log("Hello from API!");
});

app.listen(3001, () => {
  console.log(`Server is running on port 3001`);
});
```

นาย นันทพัฒน์ สมบัติวงศ์ 66543210018-8