

STEP6 ติดตั้งที่ backend1

6.1 ติดตั้ง web template (template ที่1) ที่ได้มาจากการ step5 ทำงานบน Apache ที่ /var/www/apache/web1 และทำงานที่ port 80 โดยเข้าถึงจากเครื่องภายนอกที่ url web1.backend1.com

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

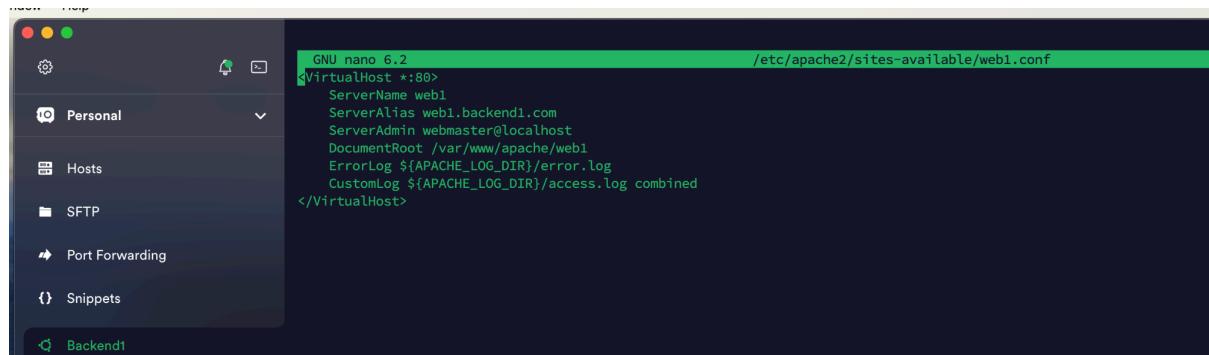
```
supakit@backend1-66543210029:~$ cd /var/www/apache/web1
supakit@backend1-66543210029:/var/www/apache/web1$ sudo chown -R $USER:$USER /var/www/apache/web1
[sudo] password for supakit:
supakit@backend1-66543210029:/var/www/apache/web1$ sudo nano /etc/apache2/sites-available/web1.conf
supakit@backend1-66543210029:/var/www/apache/web1$ sudo a2ensite web1
Site web1 already enabled
supakit@backend1-66543210029:/var/www/apache/web1$ sudo a2dissite 000-default
Site 000-default already disabled
supakit@backend1-66543210029:/var/www/apache/web1$ sudo apache2ctl configtest
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive globally to
suppress this message
Syntax OK
supakit@backend1-66543210029:/var/www/apache/web1$
```

cd /etc/apache2/sites-available/ (เข้าไปในโฟล์เดอร์ sites-available apache2)

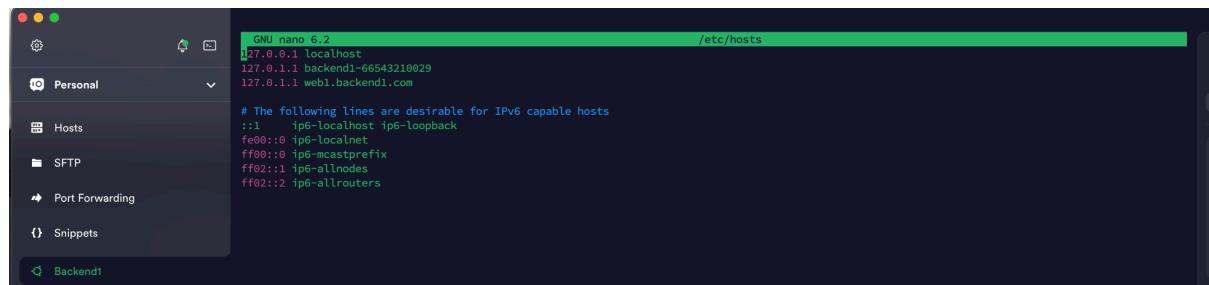
sudo cp 000-default.conf web1.conf (คลั่งยกไฟล์ default ของ apache2)

sudo nano web1.conf (เข้าไฟล์ web1)

```
<VirtualHost *:80>
    ServerName web1
    ServerAlias web1.backend1.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/apache/web1
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```



```
GNU nano 6.2                                     /etc/apache2/sites-available/web1.conf
<VirtualHost *:80>
    ServerName web1
    ServerAlias web1.backend1.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/apache/web1
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```



```
GNU nano 6.2                                     /etc/hosts
127.0.0.1 localhost
127.0.1.1 backend1-66543210029
127.0.1.1 web1.backend1.com

# The following lines are desirable for IPv6 capable hosts
::1      ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

```
supakit@backend1-66543210029:/var/www/apache/web1$ sudo systemctl restart apache2
supakit@backend1-66543210029:/var/www/apache/web1$ sudo systemctl start apache2
supakit@backend1-66543210029:/var/www/apache/web1$ sudo systemctl stop nginx
```

10.211.55.3 web1.backend1.com (edit in terminal -> sudo nano /etc/hosts)

The screenshot shows a terminal window titled "admin — pico - sudo — 80x24". The title bar also includes "File: /etc/hosts". The main area of the window displays the contents of the /etc/hosts file:

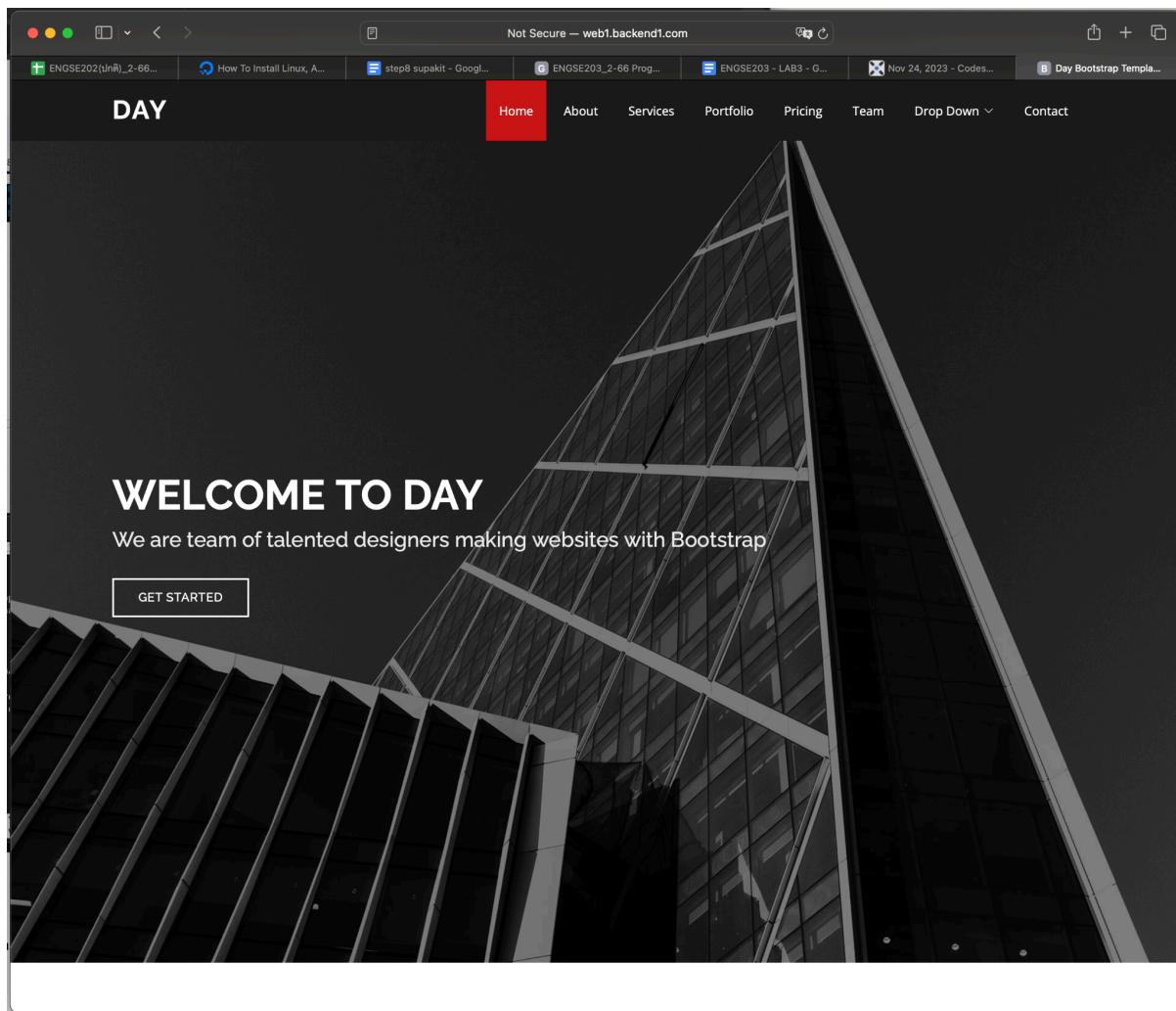
```
# Host Database
#
# localhost is used to configure the loopback interface
# when the system is booting. Do not change this entry.
##
127.0.0.1      localhost engse203.lab1
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7 www.hana lab1-1_041 lab1-2_041 www.myapp www.myapp2 my-react-app$

10.211.55.3      myapp.se-rmutl.net expressjs-example.se-rmutl.net my-react-a$
10.211.55.12    web1.midterm-engse202-029.com web2.midterm-engse202-029.com
10.211.55.3    web1.backend1.com
```

At the bottom of the window, there is a menu of keyboard shortcuts:

```
^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
```

web1.backend1.com



6.2 ติดตั้ง web template (template ที่2) ที่ได้มาจากการ step5 ทำงานบน Nginx ที่
`/var/www/nginx/web2`
และท่าทางที่ port 81 โดยเข้าสู่จากเครื่องภายนอกที่ url
`web2.backend1.com:81`

`cd /var/www/ (เข้าไปในโฟล์เดอร์ lab4)`

`mkdir nginx (สร้างไฟล์ nginx)`

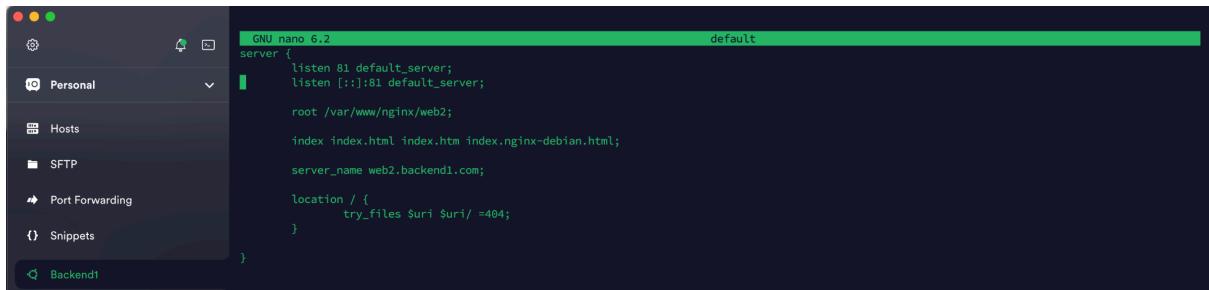
`cd nginx (เข้าไปในโฟล์เดอร์ nginx)`

`mkdir web2 (สร้างไฟล์ web2)`

`cd web2 (เข้าไปในโฟล์เดอร์ web2)`

```
supakit@backend1-66543210029:/var/www$ cd nginx/
supakit@backend1-66543210029:/var/www/nginx$ cd web2/
supakit@backend1-66543210029:/var/www/nginx/web2$ sudo chown -R $USER:$USER /var/www/nginx/web2
supakit@backend1-66543210029:/var/www/nginx/web2$ sudo nano default
supakit@backend1-66543210029:/var/www/nginx/web2$ cd /etc/nginx/sites-available/
supakit@backend1-66543210029:/etc/nginx/sites-available$ ls
app.js client default expressjs-example index.js myapp nodeLogin
supakit@backend1-66543210029:/etc/nginx/sites-available$ sudo nano default
supakit@backend1-66543210029:/etc/nginx/sites-available$
```

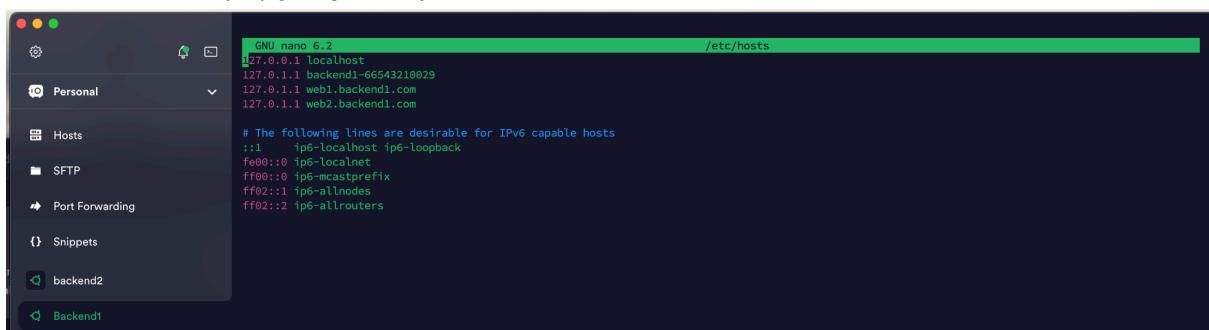
cd /etc/nginx/sites-available (เข้าไปยังโฟล์เดอร์)
sudo nano default (เข้าไปยังไฟล์เพื่อแก้ไข)



```
GNU nano 6.2
server {
    listen 81 default_server;
    listen [::]:81 default_server;
    root /var/www/nginx/web2;
    index index.html index.htm index.nginx-debian.html;
    server_name web2.backend1.com;
    location / {
        try_files $uri $uri/ =404;
    }
}
```

```
server {
    listen 81;
    listen [::]:81;
    root /var/www/nginx/web2;
    index index.html;
    server_name web2.backend1.com:81;
    location / {
        try_files $uri $uri/ =404;
    }
}
```

sudo ufw allow 81 (อนุญาต port 81)



```
GNU nano 6.2
127.0.0.1 localhost
127.0.1.1 backend1-66543210029
127.0.1.1 web1.backend1.com
127.0.1.1 web2.backend1.com

# The following lines are desirable for IPv6 capable hosts
::1      ip6-localhost ip6-loopback
fe00::0  ip6-localnet
ff00::0  ip6-mcastprefix
ff02::1  ip6-allnodes
ff02::2  ip6-allrouters
```

```
supakit@backend1-66543210029:~$ cd /var/www/nginx/web2
supakit@backend1-66543210029:/var/www/nginx/web2$ sudo nano /etc/hosts
[sudo] password for supakit:
supakit@backend1-66543210029:/var/www/nginx/web2$ sudo systemctl stop apache2
supakit@backend1-66543210029:/var/www/nginx/web2$ sudo systemctl restart nginx
supakit@backend1-66543210029:/var/www/nginx/web2$ sudo systemctl start nginx
supakit@backend1-66543210029:/var/www/nginx/web2$
```

10.211.55.3 web2.backend1.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 engse203.lab1
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7 www.hana lab1-1_041 lab1-2_041 www.myapp www.myapp2 my-react-app$
```

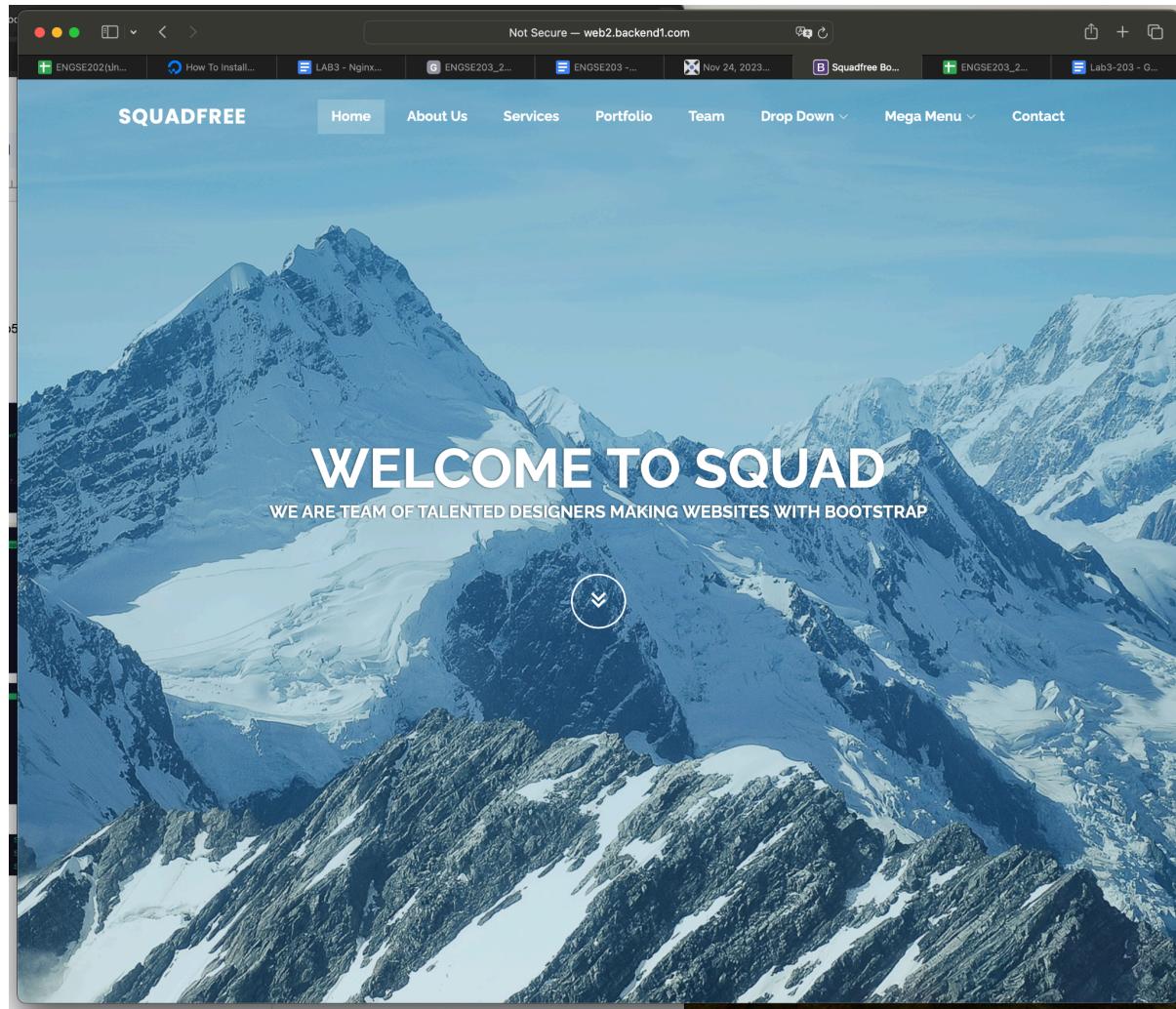
```
10.211.55.3      myapp.se-rmutil.net expressjs-example.se-rmutil.net my-react-a$
```

```
10.211.55.12    web1.midterm-engse202-029.com web2.midterm-engse202-029.com
```

```
10.211.55.3    web1.backend1.com web2.backend1.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



STEP8 ติดตั้งที่ backend1

8.1 ติดตั้ง React template (template ที่1) ที่ได้มาจากการ step7 ทำงานบน Nginx ที่

/var/www/nginx/react1

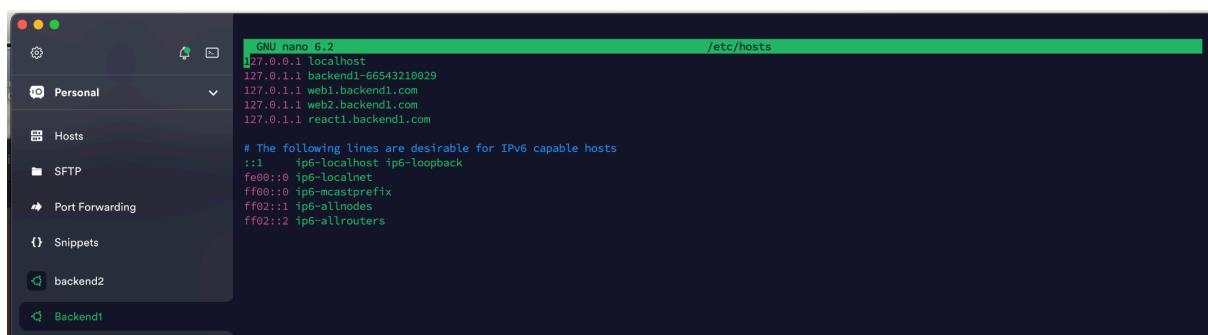
และทำงานที่ port 3010 โดยเข้าถึงจากเครื่องภายนอกที่ url

react1.backend1.com

cd /var/www/nginx (เข้าไปในโฟล์เดอร์ nginx)

mkdir react1 (สร้างไฟล์ react1)

```
supakit@backend1-66543210029:/var/www/nginx/react1$ sudo nano package.json
[sudo] password for supakit:
supakit@backend1-66543210029:/var/www/nginx/react1$ 
```



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

sudo cp default react1 (คัดลอกไฟล์มา)

sudo nano react1 (เข้าไปยังไฟล์เพื่อแก้ไข)

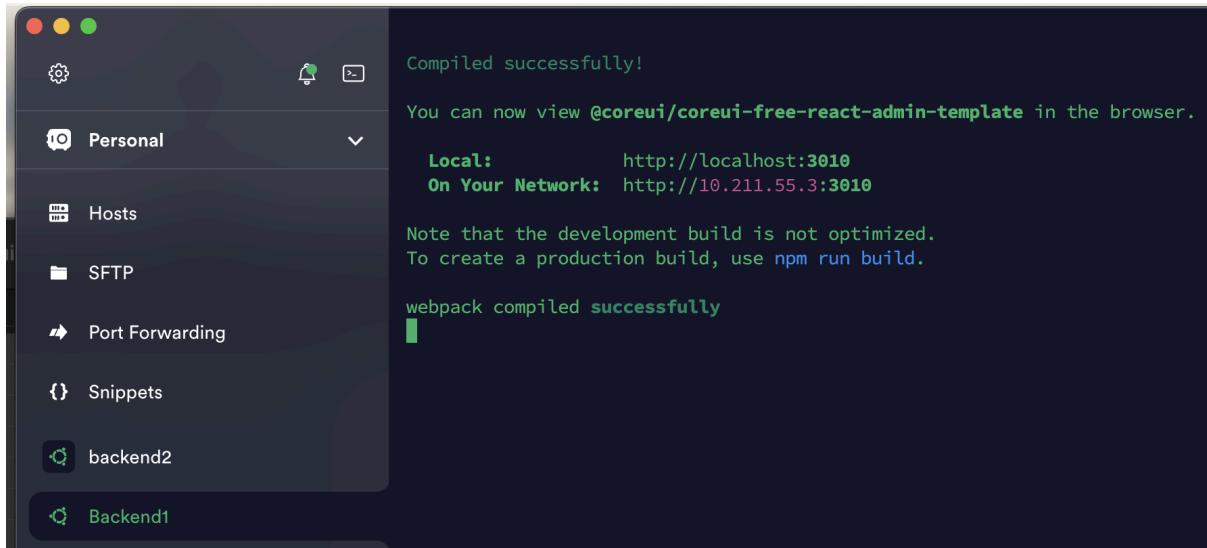
```
server {
    listen 80;
    listen [::]:80;
    server_name react1.backend1.com;

    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
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                                         package.json
{
  "name": "@coreui/coreui-free-react-admin-template",
  "version": "5.0.0-rc.0",
  "description": "CoreUI Free React Admin Template",
  "homepage": ".",
  "bugs": {
    "url": "https://github.com/coreui/coreui-free-react-admin-template/issues"
  },
  "repository": {
    "type": "git",
    "url": "git@github.com:coreui/coreui-free-react-admin-template.git"
  },
  "license": "MIT",
  "author": "The CoreUI Team (https://github.com/orgs/coreui/people)",
  "scripts": {
    "build": "react-scripts build",
    "eject": "react-scripts eject",
    "lint": "eslint \"src/**/*.{js,jsx}\"",
    "start": "PORT=3010 react-scripts start",
    "test": "react-scripts test",
    "test:cov": "npm test -- --coverage --watchAll=false",
    "test:debug": "react-scripts --inspect-brk test --runInBand"
  },
  "dependencies": {
    "@coreui/chartjs": "^4.0.0-rc.0",
    "@coreui/coreui": "^5.0.0-rc.1",
    "@coreui/icons": "^3.0.1",
    "@coreui/icons-react": "2.2.1",
    "@coreui/react": "5.0.0-rc.0",
    "@coreui/react-chartjs": "3.0.0-rc.0",
    "@coreui/utils": "2.0.2",
    "ajv": "6.11.8",
    "chart.js": "4.4.0",
    "classnames": "2.3.2",
    "core-js": "3.33.3",
    "prop-types": "15.8.1",
    "react": "18.2.0",
    "react-app-polyfill": "3.0.0",
    "react-dom": "18.2.0",
    "react-redux": "8.1.3",
    "react-router-dom": "6.21.2",
    "redux": "4.2.1",
    "simplebar-react": "3.2.4"
  },
  "devDependencies": {
    "@babel/plugin-proposal-private-property-in-object": "7.21.11",
    "@testing-library/jest-dom": "6.1.2",
    "@testing-library/react": "14.1.2",
    "@testing-library/user-event": "14.5.1",
    "eslint-config-prettier": "9.0.0",
    "eslint-plugin-prettier": "5.0.1",
    "prettier": "3.1.0",
    "react-scripts": "5.0.1",
    "sass": "1.69.5",
    "web-vitals": "3.5.0"
  },
  "engines": {
    "node": ">=10",
    "npm": ">=6"
  },
  "browserslist": {
    "production": [
      ">0.2%",
      "not dead",
      "not op_mini all"
    ],
    "development": [
      "last 1 version"
    ]
  }
}
```



10.211.55.3 react1.backend1.com

A screenshot of a terminal window titled "admin — pico - sudo — 80x24". The title bar also shows "File: /etc/hosts". The terminal content is as follows:

```
UW PICO 5.09
# 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 engse203.lab1
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7 www.hana lab1-1_041 lab1-2_041 www.myapp www.myapp2 my-react-app$
```

Below this, there are several entries that have been added or modified:

```
10.211.55.3      myapp.se-rmutl.net expressjs-example.se-rmutl.net my-react-a$
```

```
10.211.55.12    web1.midterm-engse202-029.com web2.midterm-engse202-029.com
```

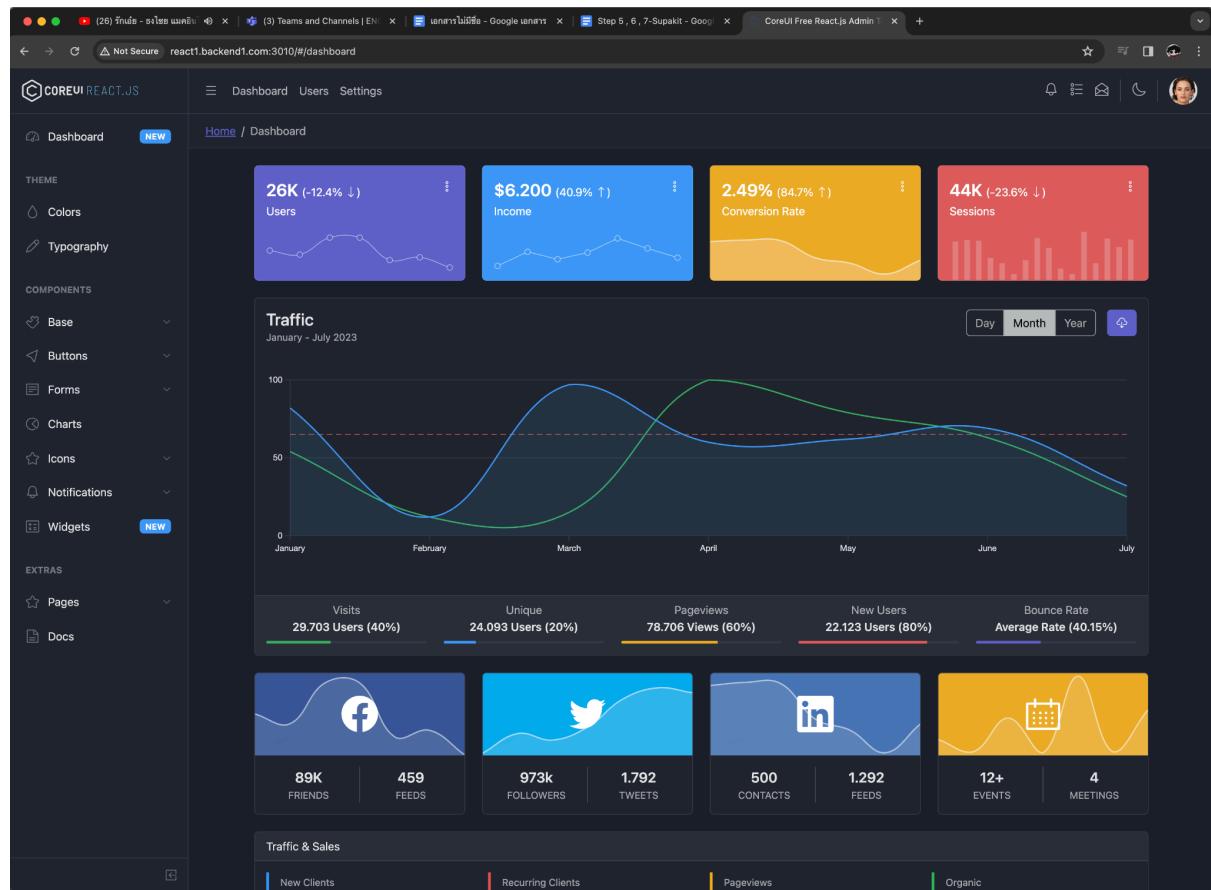
```
10.211.55.3    web1.backend1.com web2.backend1.com
```

```
10.211.55.3    react1.backend1.com
```

At the bottom of the terminal window, there is a menu of keyboard shortcuts:

```
^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
```

react1.backend1.com



8.2 ติดตั้ง React template (template ที่2) ที่ได้มาจากการ step7 ทำงานบน Nginx ที่

/var/www/nginx/react2

และทำงานที่ port 3011 โดยเข้าถึงจากเครื่องภายนอกที่ url

react2.backend1.com

cd /var/www/nginx (เข้าไปในโฟล์เดอร์ nginx)

mkdir react2 (สร้างไฟล์ react2)

sudo cp react1 react2 (คัดลอกไฟล์มา)

sudo nano react2 (เข้าไปยังไฟล์เพื่อแก้ไข)

```
supakit@backend1-66543210029:/var/www/nginx$ npx create-react-app react2
Creating a new React app in /var/www/nginx/react2.

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

added 1484 packages in 31s

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

Initialized a git repository.

Installing template dependencies using npm...
added 69 packages, and changed 1 package in 14s

254 packages are looking for funding
  run `npm fund` for details
Removing template package using npm...

removed 1 package, and audited 1553 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.
Git commit not created Error: Command failed: git commit -m "Initialize project using Create React App"
  at checkExecSyncError (node:child_process:890:11)
  at execSync (node:child_process:962:15)
  at tryGitCommit (/var/www/nginx/react2/node_modules/react-scripts/scripts/init.js:62:5)
  at module.exports (/var/www/nginx/react2/node_modules/react-scripts/scripts/init.js:350:25)
  at [eval]:3:14
  at runScriptInThisContext (node:internal/vm:144:10)
  at node:internal/process/execution:109:14
  at [eval]-wrapper:6:24
  at runScript (node:internal/process/execution:92:62) {
    status: 128,
    signal: null,
    output: [ null, null, null ],
    pid: 4317,
    stdout: null,
    stderr: null
}
Removing .git directory...

Success! Created react2 at /var/www/nginx/react2
Inside that directory, you can run several commands:

  npm start
    Starts the development server.

  npm run build
    Bundles the app into static files for production.

  npm test
    Starts the test runner.

  npm run eject
    Removes this tool and copies build dependencies, configuration files
    and scripts into the app directory. If you do this, you can't go back!

We suggest that you begin by typing:
```

```

server {
    listen 80;
    listen [::]:80;
    server_name react2.backend2.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;
    }
}

GNU nano 6.2
server {
    listen 80;
    listen [::]:80;
    server_name react2.backend2.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 3011 (อนุญาต port 3011)

```

GNU nano 6.2
/etc/hosts *
127.0.0.1 localhost
127.0.1.1 backend1-66543210029
127.0.1.1 web1.backend1.com
127.0.1.1 web2.backend1.com
127.0.1.1 react1.backend1.com
127.0.1.1 react2.backend1.com

# The following lines are desirable for IPv6 capable hosts
::1      ip6-localhost ip6-loopback
fe00::0  ip6-localnet
ff00::0  ip6-mcastprefix
ff02::1  ip6-allnodes
ff02::2  ip6-allrouters

```

The screenshot shows a terminal window titled "GNU nano 6.2" displaying the contents of a file named "package.json". The file is a JSON object containing various package dependencies and configuration settings. The terminal is part of a desktop environment with a sidebar on the left containing icons for "Personal", "Hosts", "SFTP", "Port Forwarding", "Snippets", "backend2", "Backend1", "History", and a search bar. The bottom of the terminal window shows a menu of keyboard shortcuts.

```
{
  "name": "material-dashboard-2-react",
  "version": "2.2.0",
  "private": true,
  "author": "Creative Tim",
  "license": "See license in https://www.creative-tim.com/license",
  "description": "React version of Material Dashboard 2 by Creative Tim",
  "bugs": {
    "url": "https://github.com/creativetimofficial/material-dashboard-react/issues"
  },
  "repository": {
    "type": "git",
    "url": "git+https://github.com/creativetimofficial/material-dashboard-react.git"
  },
  "dependencies": {
    "emotion/cache": "11.10.8",
    "emotion/react": "11.10.8",
    "emotion/styled": "11.10.8",
    "emui/icon-material": "5.11.16",
    "emui/material": "5.12.3",
    "chart.js": "4.3.0",
    "chroma-js": "2.4.2",
    "prop-types": "15.8.1",
    "react": "18.2.0",
    "react-chartjs-2": "5.2.0",
    "react-dom": "18.2.0",
    "react-github-btn": "1.4.0",
    "react-router-dom": "6.11.0",
    "react-scripts": "5.0.1",
    "react-table": "7.8.0",
    "stylis": "4.1.4",
    "stylis-plugin-rtl": "2.1.1",
    "yup": "1.1.1"
  },
  "scripts": {
    "start": "PORT=3011 GENERATE_SOURCEMAP=false react-scripts start",
    "build": "GENERATE_SOURCEMAP=false react-scripts build",
    "test": "react-scripts test",
    "eject": "react-scripts eject",
    "install:clean": "rm -rf node_modules/ && rm package-lock.json && npm install && npm start"
  },
  "eslintConfig": {
    "extends": [
      "react-app",
      "react-app/jest"
    ]
  },
  "browserslist": {
    "production": [
      "≥.29",
      "not dead",
      "not op_mini all"
    ],
    "development": [
      "last 1 chrome version",
      "last 1 firefox version",
      "last 1 safari version"
    ]
  },
  "devDependencies": {
    "eslint": "8.39.0",
    "eslint-config-prettier": "8.8.0",
    "eslint-plugin-import": "2.27.5",
    "eslint-plugin-jscs-ally": "6.7.1",
    "eslint-plugin-prettier": "4.2.1",
    "eslint-plugin-react": "7.32.2",
    "eslint-plugin-react-hooks": "4.6.0"
  }
}
```

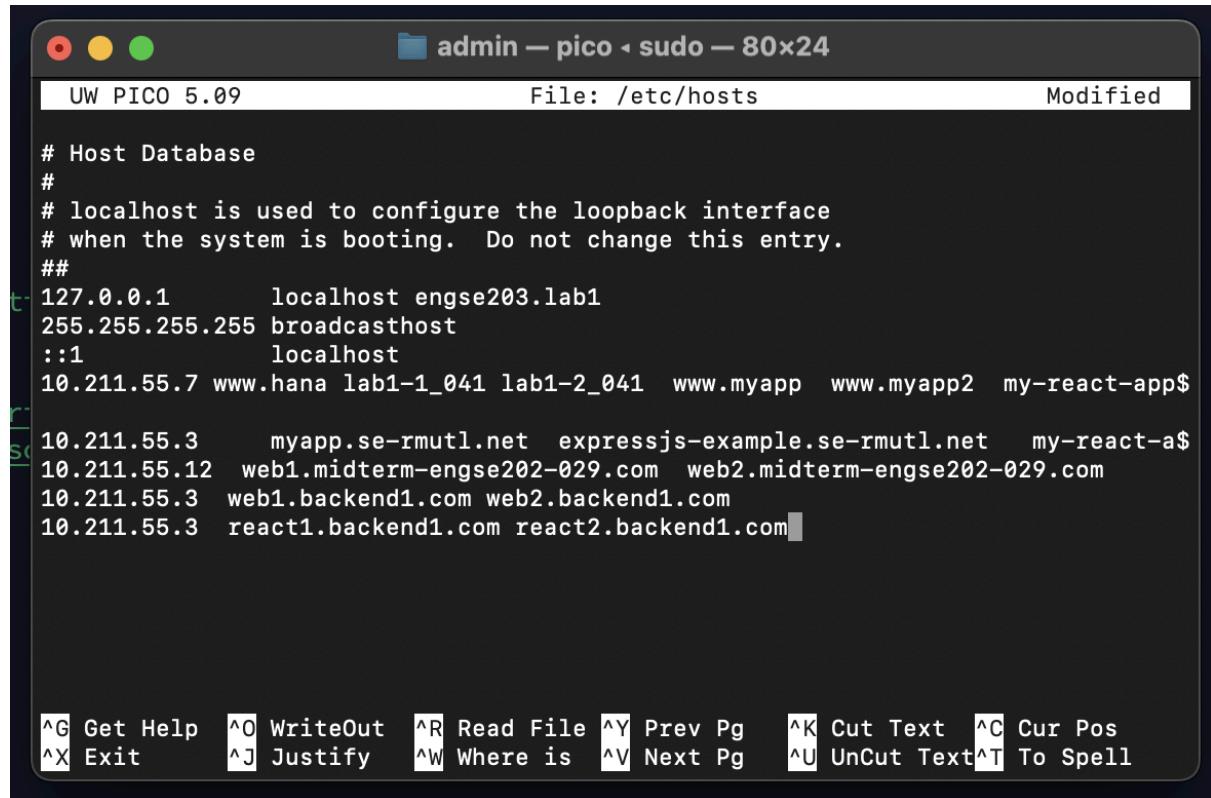
[Cancelled]

GNU nano 6.2 package.json *

Help Write Out Where Is Cut Execute Location Undo Set Mark To Bracket

Exit Read File Replace Paste Justify Go To Line Redo Copy Where Was

10.211.55.3 react2.backend1.com



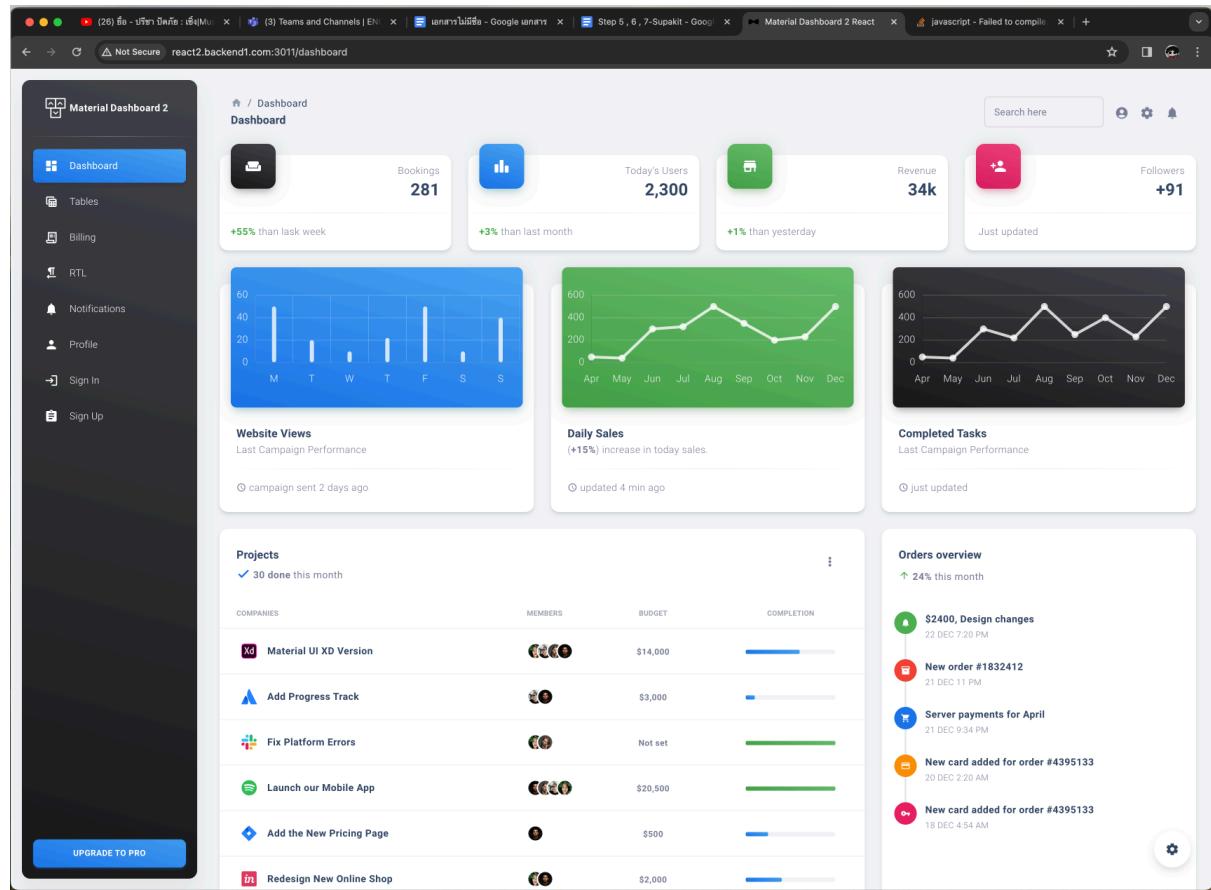
```
UW PICO 5.09          File: /etc/hosts          Modified

# Host Database
#
# localhost is used to configure the loopback interface
# when the system is booting. Do not change this entry.
###
t 127.0.0.1      localhost engse203.lab1
255.255.255.255 broadcasthost
::1              localhost
10.211.55.7 www.hana lab1-1_041 lab1-2_041 www.myapp www.myapp2 my-react-app$C

10.211.55.3 myapp.se-rmrtl.net expressjs-example.se-rmrtl.net my-react-a$S
10.211.55.12 web1.midterm-engse202-029.com web2.midterm-engse202-029.com
10.211.55.3 web1.backend1.com web2.backend1.com
10.211.55.3 react1.backend1.com react2.backend1.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
```

react2.backend1.com



The screenshot shows a complex dashboard with the following key components:

- Top Header:** Shows navigation links like "Dashboard", "Tables", "Billing", "RTL", "Notifications", "Profile", "Sign In", and "Sign Up".
- Booking Summary:** Displays "Bookings 281" with a note "+55% than last week".
- User Activity:** Shows "Today's Users 2,300" with a note "+3% than last month".
- Revenue:** Displays "Revenue 34k" with a note "+1% than yesterday".
- Followers:** Shows "Followers +91" with a note "Just updated".
- Website Views:** A bar chart titled "Website Views" showing traffic by day of the week.
- Daily Sales:** A line chart titled "Daily Sales" showing sales over time, with a note "+15% increase in today sales".
- Completed Tasks:** A line chart titled "Completed Tasks" showing task completion over time, with a note "Last Campaign Performance".
- Projects:** A table listing various projects with columns for Companies, Members, Budget, and Completion. Projects include "Material UI XD Version", "Add Progress Track", "Fix Platform Errors", "Launch our Mobile App", "Add the New Pricing Page", and "Redesign New Online Shop".
- Orders Overview:** A table listing recent orders with columns for Order ID, Description, and Date. Orders include "\$2400, Design changes", "New order #1832412", "Server payments for April", "New card added for order #4395133", and "New card added for order #4395133".

STEP9 ติดตั้งที่ backend2

ติดตั้งทำงานบน nginx ที่ `/var/www/nginx/server`
บนเครื่อง backend2

กำหนดให้ทำงานที่ port : 4040

API URL: `http://api.backend2.com :4040`

`sudo ufw allow 4040` (อนุญาต port 4040)

`cd /etc/nginx/sites-available/` (เข้าไฟล์)

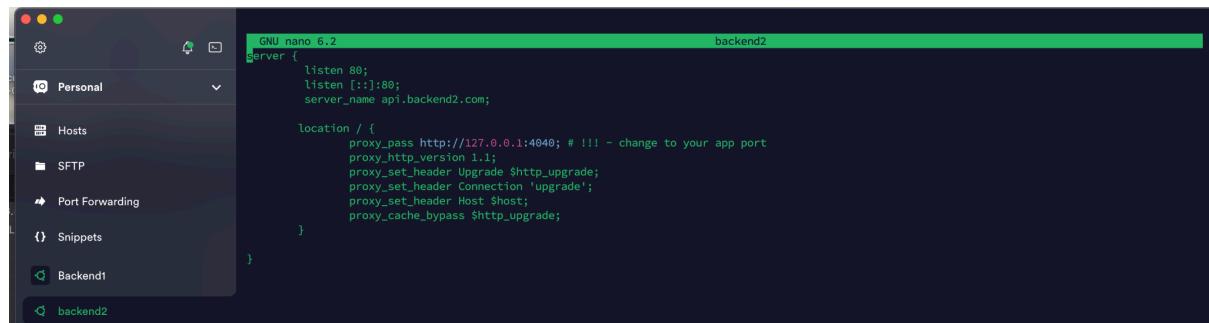
`sudo cp default backend2` (คัดลอกไฟล์)

`sudo nano backend2` (เข้าไปในไฟล์)

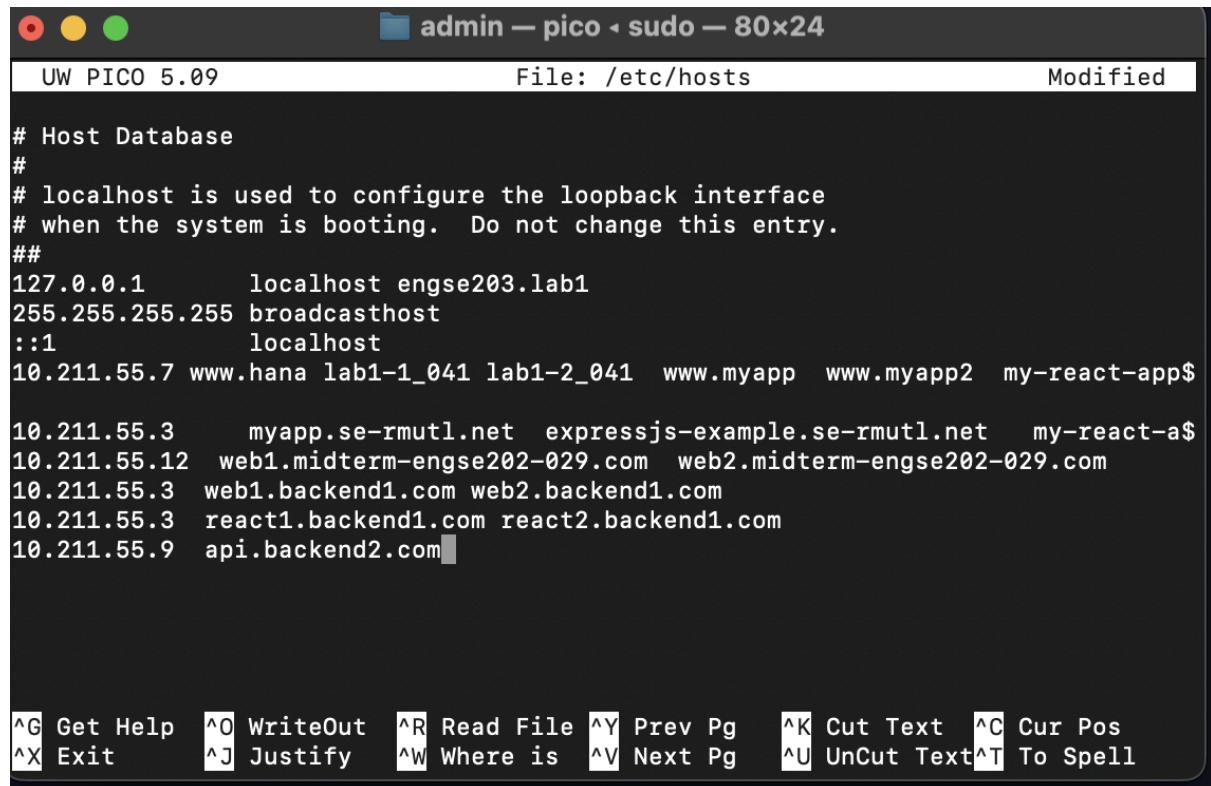
```
supakit@backend2-66543210029:~$ cd /etc/nginx/sites-available/
supakit@backend2-66543210029:/etc/nginx/sites-available$ sudo ufw allow 4040
[sudo] password for supakit:
Rule added
Rule added (v6)
supakit@backend2-66543210029:/etc/nginx/sites-available$
```

```
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;
}
```



10.211.55.3 api.backend2.com (edit in terminal -> sudo nano /etc/hosts)(เพิ่มโดเมน)



```
# 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 engse203.lab1
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7 www.hana lab1-1_041 lab1-2_041 www.myapp www.myapp2 my-react-app$
```

```
10.211.55.3      myapp.se-rmutil.net expressjs-example.se-rmutil.net my-react-a$
```

```
10.211.55.12    web1.midterm-engse202-029.com web2.midterm-engse202-029.com
```

```
10.211.55.3    web1.backend1.com web2.backend1.com
```

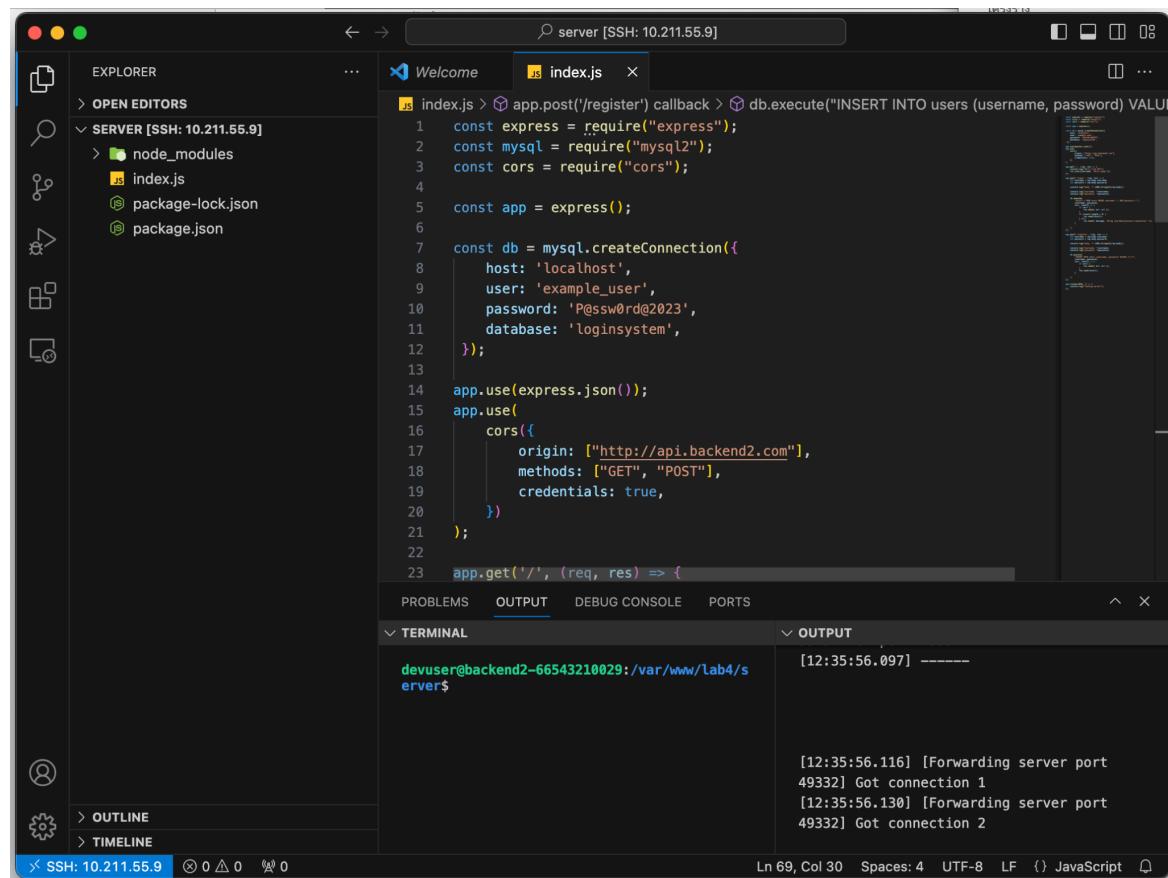
```
10.211.55.3    react1.backend1.com react2.backend1.com
```

```
10.211.55.9    api.backend2.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

ให้รันแบบโดเมนโดยเข้าไปแก้พอร์ตใน server/index.js

origin: ["http://weblogin.se-rmutil.net"], => origin: ["http://api.backend2.com"],



The code editor displays the `index.js` file with the following content:

```
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://api.backend2.com"],
    methods: ["GET", "POST"],
    credentials: true,
  })
);
app.get('/', (req, res) => {
```

The terminal window shows the following log output:

```
[12:35:56.097] -----
[12:35:56.116] [Forwarding server port 49332] Got connection 1
[12:35:56.130] [Forwarding server port 49332] Got connection 2
```

STEP10 ติดตั้งที่ backend2

ทดสอบเรียกใช้งาน API ใน Step9 โดยใช้ Postman ทั้ง GET และ POST
node index.js (รัน server)

```
devuser@backend2-66543210029:/var/www/lab4/server$ sudo systemctl stop apache2
devuser@backend2-66543210029:/var/www/lab4/server$ sudo systemctl restart nginx
devuser@backend2-66543210029:/var/www/lab4/server$ sudo systemctl start nginx
devuser@backend2-66543210029:/var/www/lab4/server$ node index.js
running server
```

POSTman : <http://api.backend2.com:4040>

GET

The screenshot shows a dual-monitor setup. The left monitor displays a terminal window with the following content:

```
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-91-generic aarch64)

Documentation: https://help.ubuntu.com
Management: https://landscape.canonical.com
Support: https://ubuntu.com/advantage

System information as of Wed Jan 17 10:48:05 UTC 2024

System Load: 0.05664925
Usage of /: 68.0G of 61.06GB
Memory usage: 52%
Swap usage: 0B
Processes: 135
Users logged in: 2
IPv4 address for empsdk1: 10.211.55.0
IPv6 address for empsdk1: fd02:2c6:74e4:1b:21c:42ff:fe04:a97

+ Strictly confined Kubernetes makes edge and IoT secure. Learn how we
  strictly raised the bar for easy, resilient and secure K8s cluster
  deployment.
```

The right monitor displays the Postman client interface. A history entry for "GET http://api.backend2.com" is selected. The response body shows the following JSON output:

```
{"message": "Hello from API"}  
{"message": "Hello from API"}
```

POST

The screenshot shows two windows side-by-side. On the left is a terminal window titled 'Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-91-generic arm64)'. It displays system information, including memory usage, processes, and a warning about Kubernetes edge and IoT security. Below this is a history of commands, including a failed attempt to log in as 'deveruser'.

On the right is a Postman API client window. It shows a 'History' tab with a single entry: a POST request to 'http://api.backend2.com'. The response status is '405 Not Allowed'. The 'Body' tab shows the raw HTML content of the error page:

```
1 <html>
2   <head>
3     <title>405 Not Allowed</title>
4   </head>
5   <body>
6     <center>
7       <h1>405 Not Allowed</h1>
8     </center>
9     <br>
10    <hr>
11    <center>nginx/1.18.0 (Ubuntu)</center>
12  </body>
13</html>
```

STEP11 ติดตั้งที่ backend1

จากบทความข้างล่างให้ติดตั้ง Client Code บนเครื่อง backend1

**ใช้ code เฉพาะ Front-end เท่านั้น

cd /var/www/nginx (เข้าไปในโฟล์เดอร์ nginx)

mkdir backend1 (สร้างไฟล์ backend1)

cd backend1 (เข้าไปในโฟล์เดอร์ backend1)

npx create-react-app . (สร้างโปรเจกต์ react)

```
supakit@backend1-66543210029:~$ cd /var/www/nginx/
supakit@backend1-66543210029:/var/www/nginx$ mkdir backend1
supakit@backend1-66543210029:/var/www/nginx$ cd backend1/
supakit@backend1-66543210029:/var/www/nginx$ cd backend1/
supakit@backend1-66543210029:/var/www/nginx$ cd backend1/
supakit@backend1-66543210029:/var/www/nginx$ npx create-react-app .

Creating a new React app in /var/www/nginx/backend1.

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

added 1484 packages in 48s

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

Initialized a git repository.

Installing template dependencies using npm...

added 69 packages, and changed 1 package in 9s

254 packages are looking for funding
  run `npm fund` for details
Removing template package using npm...

removed 1 package, and audited 1553 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.
Git commit not created Error: Command failed: git commit -m "Initialize project using Create React App"
at checkExecSyncError (node:child_process:890:11)
at execSync (node:child_process:962:15)
at tryGitCommit (/var/www/nginx/backend1/node_modules/react-scripts/scripts/init.js:62:5)
at module.exports (/var/www/nginx/backend1/node_modules/react-scripts/scripts/init.js:350:25)
at [eval]:3:14
at runScriptInThisContext (node:internal/vm:144:10)
at node:internal/process/execution:109:14
at [eval]-wrapper:6:24
at runScript (node:internal/process/execution:92:62) {
  status: 128,
  signal: null,
  output: [ null, null, null ],
  pid: 6388,
  stdout: null,
  stderr: null
}
Removing .git directory...
```

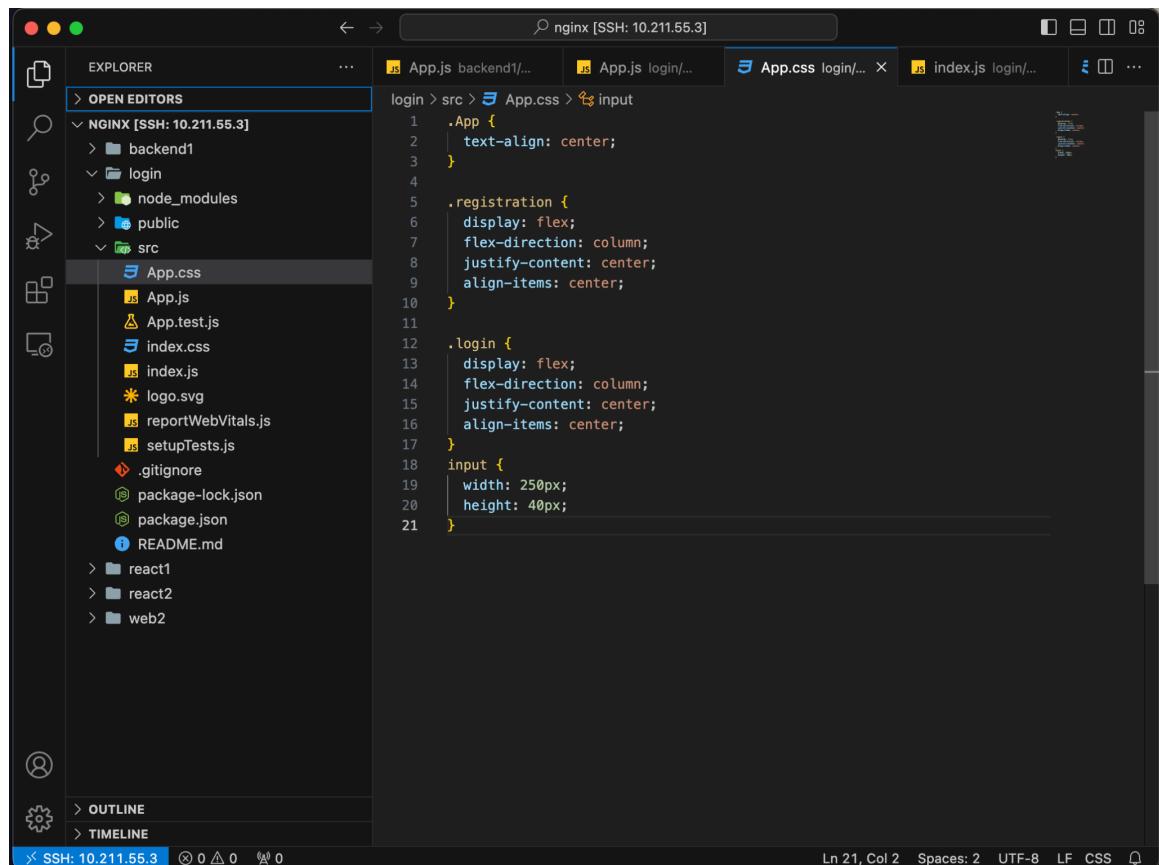
นำ source code เข้ามา

client/src/App.js แก้พอร์ตเป็น 4040

The screenshot shows a code editor interface with the following details:

- EXPLORER** sidebar:
 - OPEN EDITORS**: package.json react1, package.json backend1, App.js backend1/src (highlighted)
 - NGINX [SSH: 10.211.55.3]**: backend1, public, src
 - App.css, App.js (highlighted), App.test.js, index.css, index.js, logo.svg, reportWebVitals.js, setupTests.js, .gitignore, package-lock.json, package.json, README.md
 - react1, react2, web2- EDITOR**: The main editor area displays the content of `App.js` from the `backend1/src` directory. The code implements a login functionality using React hooks (`useState`, `useEffect`) and the `Axios` library to interact with a local server at `http://localhost:4040`. It includes functions for `register` and `login`.
- STATUS BAR**: SSH connection to `10.211.55.3`, file navigation icons, and file status indicators.

client/src/App.css



```
1  .App {  
2  |   text-align: center;  
3  }  
4  
5  .registration {  
6  |   display: flex;  
7  |   flex-direction: column;  
8  |   justify-content: center;  
9  |   align-items: center;  
10 }  
11  
12 .login {  
13 |   display: flex;  
14 |   flex-direction: column;  
15 |   justify-content: center;  
16 |   align-items: center;  
17 }  
18 input {  
19 |   width: 250px;  
20 |   height: 40px;  
21 }
```

client/src/index.js

The screenshot shows the VS Code interface with the title bar "nginx [SSH: 10.211.55.3]". The Explorer sidebar on the left shows a project structure under "NGINX [SSH: 10.211.55.3]". The "OPEN EDITORS" section has four tabs: "App.js backend1/...", "App.js login/...", "App.css login/...", and "index.js login/...". The "index.js" tab is active, displaying the following code:

```
1 import React from 'react';
2 import ReactDOM from 'react-dom';
3 import './App.css';
4 import App from './App';

5 ReactDOM.render(
6   <React.StrictMode>
7     | <App />
8   </React.StrictMode>,
9   document.getElementById('root')
10 );
11
12 
```

ไปที่ไฟล์ package.json เพิ่มพอร์ต 3012 เข้าไป

The screenshot shows the VS Code interface with the title bar "nginx [SSH: 10.211.55.3]". The Explorer sidebar on the left shows a project structure under "NGINX [SSH: 10.211.55.3]". The "OPEN EDITORS" section has four tabs: "App.js login/...", "App.css login/...", "index.js login/...", and "package.json". The "package.json" tab is active, displaying the following JSON configuration:

```
1/...
2 {
3   "name": "login",
4   "version": "0.1.0",
5   "private": true,
6   "dependencies": {
7     "@testing-library/jest-dom": "^5.17.0",
8     "@testing-library/react": "^13.4.0",
9     "@testing-library/user-event": "^13.5.0",
10    "react": "^18.2.0",
11    "react-dom": "18.2.0",
12    "react-scripts": "5.0.1",
13    "web-vitals": "^2.1.4"
14  },
15  "scripts": [
16    "start": "PORT=3012 react-scripts start",
17    "build": "react-scripts build",
18    "test": "react-scripts test",
19    "eject": "react-scripts eject"
20  ],
21  "eslintConfig": {
22    "extends": [
23      "react-app",
24      "react-app/jest"
25    ]
26  },
27  "browserslist": {
28    "production": [
29      ">0.2%",
30      "not dead",
31      "not op_mini all"
32    ],
33    "development": [
34      "last 1 chrome version",
35      "last 1 firefox version",
36      "last 1 safari version"
37    ]
38  }
39 }
```

ติดตั้งทำงานบน Nginx ที่ /var/www/nginx/login
และทำงานที่ port 3012 โดยเข้าถึงจากเครื่องภายนอกที่ url
API URL: http://login.backend1.com

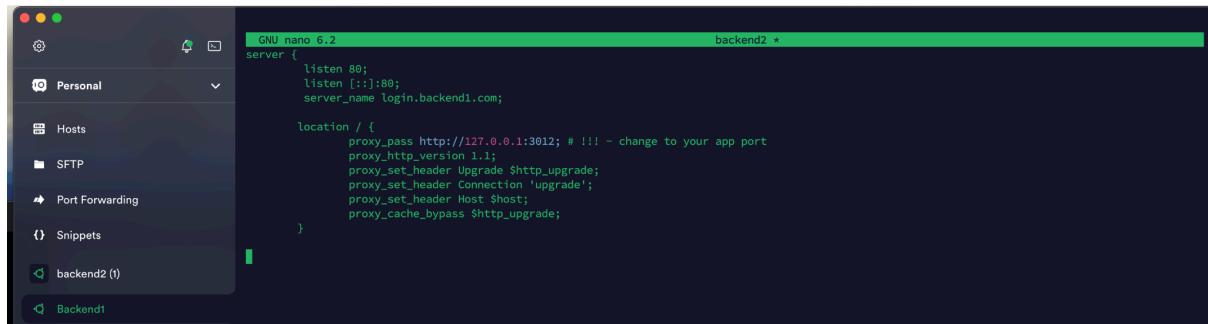
sudo ufw allow 3012 (อนุญาต port 3012)
cd /etc/nginx/sites-available (เข้าไปยังโฟล์เดอร์ sites-available)
sudo cp default backend2 (คัดลอกไฟล์ backend2)
sudo nano backend2 (เข้าไปยังไฟล์ backend2)

```
supakit@backend1-66543210029:~$ cd /var/www/nginx/login/
supakit@backend1-66543210029:/var/www/nginx/login$ sudo ufw allow 3012
[sudo] password for supakit:
Skipping adding existing rule
Skipping adding existing rule (v6)
supakit@backend1-66543210029:/var/www/nginx/login$
```

```
server {
    listen 80;
    listen [::]:80;
    server_name login.backend1.com;

    location / {
        proxy_pass http://127.0.0.1:3012; # !!! - 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;
    }
}
```

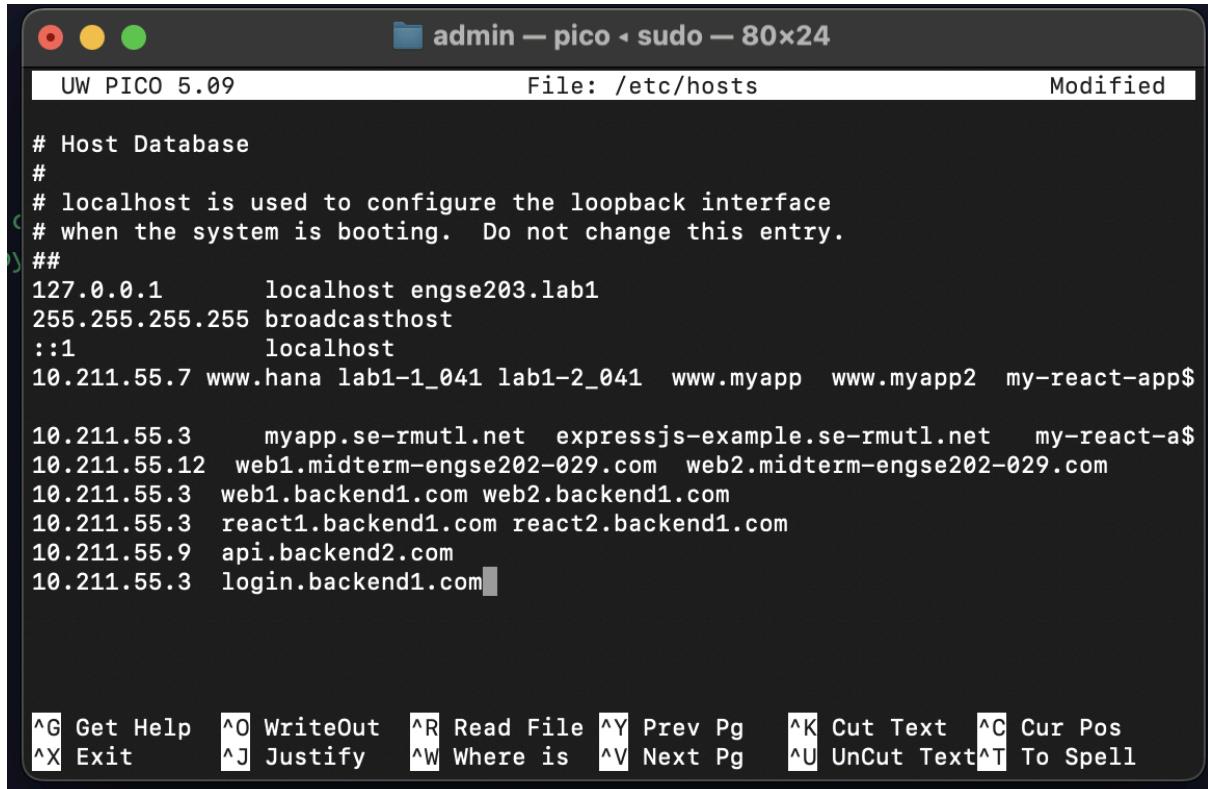
10.2



```
server {
    listen 80;
    listen [::]:80;
    server_name login.backend1.com;

    location / {
        proxy_pass http://127.0.0.1:3012; # !!! - 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;
    }
}
```

11.55.5 login.backend1.com (edit in terminal -> sudo nano /etc/hosts)(เพิ่มโดเมน)



```
# 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 engse203.lab1
255.255.255.255 broadcasthost
::1            localhost
10.211.55.7 www.hana lab1-1_041 lab1-2_041 www.myapp www.myapp2 my-react-app$
```

```
10.211.55.3      myapp.se-rmutl.net expressjs-example.se-rmutl.net my-react-a$
```

```
10.211.55.12 web1.midterm-engse202-029.com web2.midterm-engse202-029.com
```

```
10.211.55.3 web1.backend1.com web2.backend1.com
```

```
10.211.55.3 react1.backend1.com react2.backend1.com
```

```
10.211.55.9 api.backend2.com
```

```
10.211.55.3 login.backend1.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 ^I To Spell

npm install express --save (ติดตั้ง express)

npm install --save mysql2 (ติดตั้ง mysql2)

npm i --save cors (ติดตั้ง cors)

```
devuser@backend1-66543210029:/var/www/nginx/login$ npm install express --save
up to date, audited 1553 packages in 8s
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@backend1-66543210029:/var/www/nginx/login$ npm install --save mysql2
added 10 packages, and audited 1563 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@backend1-66543210029:/var/www/nginx/login$ npm i --save cors
added 1 package, and audited 1564 packages in 12s
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@backend1-66543210029:/var/www/nginx/login$
```

ให้รันแบบโดเมนโดยเข้าไปแก้พอร์ตใน server/index.js
origin: ["<http://10.211.55.5:3004>"], => origin: ["<http://login.backend1.com>"],

The screenshot shows a Visual Studio Code (VS Code) interface connected via SSH to a server at 10.211.55.3. The Explorer sidebar on the left lists files in the current directory, including node_modules/index.js, package-lock.json, and package.json. The main editor area displays the contents of index.js, which includes code for setting up an Express server with CORS and handling GET and POST requests. The terminal below shows a session where the user has run a command to forward a local port to the server's port 4000. The output panel shows the log messages from this forwarding process.

```
index.js
10 origin
11   password: "P@ssw0rD0@2023",
12   database: "loginsystem",
13 );
14 app.use(express.json());
15 app.use(
16   cors({
17     origin: ["http://login.backend1.com"],
18     methods: ["GET", "POST"],
19     credentials: true,
20   })
21 );
22
23 app.get('/', (req, res) => {
24   console.log("Hello from API");
25   res.json({username: 'Hello myapi'});
26 });
27
28 app.post('/login', (req, res) => {
29   let username = req.body.username;
30   let password = req.body.password;
31
32   console.log("body: " + JSON.stringify(req.body));
33 });

PROBLEMS OUTPUT DEBUG CONSOLE PORTS
```

TERMINAL

```
devuser@backend1-66543210029:/var/www/lab4/server$
```

OUTPUT

```
[12:36:29.311] -----
[12:36:29.320] [Forwarding server
port 49384] Got connection 1
[12:36:29.337] [Forwarding server
port 49384] Got connection 2
```

นำตัว client ไปวางบนตัว server Axios.post("http://10.211.55.9:4000/register",

The screenshot shows a terminal window with the following content:

```
The build folder is ready to be deployed.  
You may serve it with a static server:  
  npm install -g serve  
  serve -s build  
Find out more about deployment here:  
  https://cra.link/deployment
```

Terminal output:

```
[devuser@backend1-66543210029: /var/www/lab4/client]$ [15:50:15.157]  
[Forwarding server port 51369] Got connection 1  
[15:50:15.277]  
[Forwarding server port 51369] Got connection 2
```

SSH status: devuser@10.211.55.3

File Explorer:

- CLIENT [SSH: 10.211.55.3]
 - build
 - node_modules
 - public
 - src
 - App.css
 - App.js
 - App.test.js
 - index.css
 - index.js
 - logo.svg
 - reportWebVitals.js
 - setupTests.js
 - .gitignore
 - package-lock.json
 - package.json
 - README.md

Editor:

```
const register = () => {  
  Axios.post("http://10.211.55.9:4000/register", {  
    username: usernameReg,  
    password: passwordReg,  
  }).then((response) => {  
    console.log(response);  
  
    if (!response.data.err) {  
      setLoginStatus("'" +usernameReg + "' was inserted.");  
    } else {  
      setLoginStatus(response.data.err.sqlMessage);  
    }  
  });  
  
  const login = () => {  
    Axios.post("http://10.211.55.9:4000/login", {  
      username: username,  
      password: password,  
    }).then((response) => {  
      console.log(response);  
    });  
  };  
};
```

Output:

```
[15:50:15.157]  
[Forwarding server port 51369] Got connection 1  
[15:50:15.277]  
[Forwarding server port 51369] Got connection 2
```

ให้รันแบบโดเมน

The screenshot shows a terminal window with two panes. The left pane displays the configuration of a firewall (UFW) and MySQL database, while the right pane shows the execution of a Node.js application.

Left Pane (Terminal Configuration):

```
devuser@backend2:~$ sudo ufw status
Status: active
To                         Action      Protocol
--                         --          --
OpenSSH (v6)                ALLOW     Anywhere (v6)
4000 (v6)                  ALLOW     Anywhere (v6)
Apache (v6)                 ALLOW     Anywhere (v6)
4040 (v6)                  ALLOW     Anywhere (v6)

devuser@backend2:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 13
Server version: 8.0.35-Ubuntu0.22.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> USE loginsystem;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

+-----+-----+
| username | password |
+-----+-----+
| test    | test    |
+-----+-----+
1 row in set (0.00 sec)
```

Right Pane (Application Execution):

```
devuser@backend2:~$ node index.js
running server
^C
devuser@backend2:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 13
Server version: 8.0.35-Ubuntu0.22.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> USE loginsystem;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

+-----+-----+
| username | password |
+-----+-----+
| test    | test    |
+-----+-----+
1 row in set (0.00 sec)

mysql> exit
Bye
devuser@backend2:~$ sudo apt install apache2
root@backend2:~$ node index.js
node:internal/modules/cjs/loader:1147
    throw err;
^C
Error: Cannot find module '/root/index.js'
    at Module._resolveFilename (node:internal/modules/cjs/loader:1144:15)
    at Module._load (node:internal/modules/cjs/loader:985:27)
    at Function.executeUserEntryPoint [as runMain] (node:internal/modules/run_main:135:12)
    at node:internal/main/run_main_module:28:49 {
      code: 'MODULE_NOT_FOUND',
      requireStack: []
}

Node.js v20.11.0
root@backend2:~$ cd /var/www/lab4/server/
root@backend2:~/var/www/lab4/server$ node index.js
running server
Hello from API
Hello from API
body: {"username":"test","password":"test"}
username: test
password: test
body: {"username":"test","password":"test"}
username: test
password: test
[]
```

On the right side of the terminal, there is a scrollable list of command history:

- sudo -i
- sudo ufw status
- sudo ufw allow in "Apache"
- sudo ufw app list
- sudo apt install apache2
- sudo apt update
- node -v
- sudo reboot
- sudo nano /etc/hosts
- sudo nano /etc/hostname
- sudo ufw allow 4000
- sudo mysql -u root -p
- sudo chown -R \$USER:\$USER /var/www/lab4/server
- npm -v
- sudo ufw allow 'Nginx Full'
- sudo -u root -p
- sudo mysql
- sudo apt install mysql-server-8.0
- sudo apt info -a mysql-server-8.0
- sudo apt-cache search mysql-server
- sudo apt upgrade
- npm install mysql2 --save

<http://login.backend1.com>

The screenshot shows a web browser window with the URL [Not Secure — login.backend1.com](http://login.backend1.com). The browser has several tabs open in the background, including "ENGSE203_2-66 Progress a...", "Lab3-203 - Google Sheets", "Part-1-User-registration-and...", "ENGSE203 - LAB3 - Google...", "ENGSE202(tInRi)_2-66 Prog...", and "React App".

The main content area displays a registration form with fields for "Username" and "password", and a "Register" button. Below it is a login form with fields for "test" and "****", and a "Login" button. A success message, "'test' was logged in.", is displayed below the login form.

Registration

Username

password

Register

Login

Login

'test' was logged in.