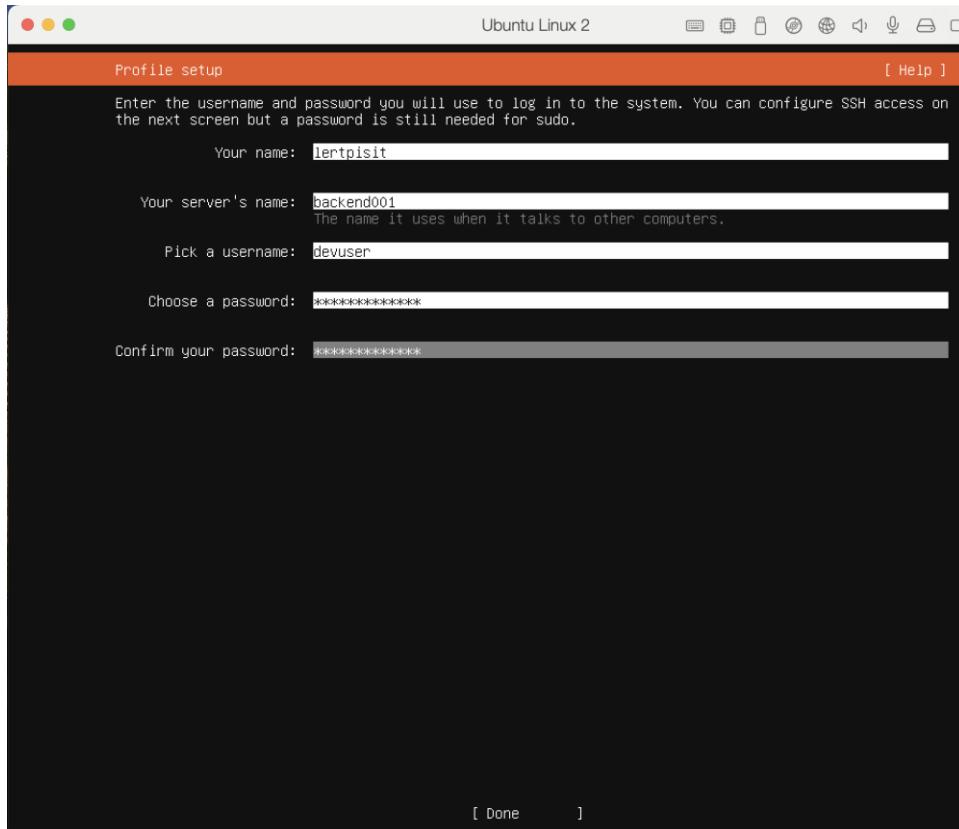


Lab 4

ลง ubuntu server สำหรับ backend



```
Ubuntu 22.04.3 LTS backend001 tty1

backend001 login: [ 14.896692] cloud-init[1323]: Cloud-init v. 23.2.1-0ubuntu0~22.04.1 running 'modules:config' at Wed, 03 Jan 2024 04:28:15 +0000. Up 14.87 seconds.
[ 14.92215] cloud-init[1323]: Generating locales (this might take a while)...
[ 15.705620] cloud-init[1323]: en_US.UTF-8... done
[ 15.70601] cloud-init[1323]: Generation complete.
[ 15.976342] cloud-init[1364]: Cloud-init v. 23.2.1-0ubuntu0~22.04.1 running 'modules:final' at Wed, 03 Jan 2024 04:28:16 +0000. Up 15.95 seconds.
ci-info: no authorized SSH keys fingerprints found for user devuser.
[14:Jan 3 04:28:16 cloud-init: #####-----BEGIN SSH HOST KEY FINGERPRINTS-----#
[14:Jan 3 04:28:16 cloud-init: 1024 SHA256:VX/zDNUPYAJF1zzsbQW1Pfa0g6MLERgc0t0Khf3yR0 root@backend001 (DSA)
[14:Jan 3 04:28:16 cloud-init: 256 SHA256:Ma2tFt91TlUjgnEJectGCEFdVd0LDFV21loJu1SD9X+w root@backend001 (EDDSA)
[14:Jan 3 04:28:16 cloud-init: 256 SHA256:k-fis15Icb7-4LbMGuia7c4E03d1chhkh4/K0 root@backend001 (ED25519)
[14:Jan 3 04:28:16 cloud-init: 3072 SHA256:Eo4GD0DleIVyv+VMeAotsgjXtIE1Vm5fR/xgb1Ue2bKE root@backend001 (RSA)
[14:Jan 3 04:28:16 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----#
[14:Jan 3 04:28:16 cloud-init: #####-----BEGIN SSH HOST KEY KEYS-----#
ecdsa-sha2-nistp256 AAAAE2VjZHNhLKNyYTibm1zdHajNtYAAAABBFdUnCrFf5dEuKcj4PrBvPhR8xFOnRgLAjNH+ABLJkIA0JGvW1v47In6z2blAYXkz1Ipgr89y7kfqfMnRz... root@backend001
ssh-ed25519 AAAAC3nzaC1ZDI1TESEAIIAGo/W1VUD08gHbyTkJsfPSQpLHFk24/6d1KkdJxJrzxw root@backend001
ssh-rsa AAAAB3NzaC1yc2EAAQABAAQgB0C1YiYo+xMbE023Qe2ZM6w0FaAnhltGg0ogg9PVyPQ0F333H7v0nVgSA3KFBd67ru/+K9hd8xV6dPzoY1oFlJdfiexNcc0/0xQELopmLRz9PsMHT1xt957mn2ZB0d21uecYnxQ77Bcs1eD7+mrJyC3+GD1Ktn5ghsz2cg4Eo202b3RMw0d/X2esU5t0fs1U6sk0fSIU1fJd1fjyforsCRKV7uDN62-SBrduy0My1JENkrImbkyIwKc/gLz7eICBuVLVnf02R0Rngz601vnF05QJkgE8B2Us6sJbk'sY+Lhn10E3Y1+3qik03NucB6eAKTrTIC/VQDyHfz1M2a66EB400XXNkZk2MsHMj4JxTyrKgRr8= root@backend001
-----END SSH HOST KEY KEYS-----
[ 16.033580] cloud-init[1364]: Cloud-init v. 23.2.1-0ubuntu0~22.04.1 finished at Wed, 03 Jan 2024 04:28:16 +0000. Data source None. Up 16.03 seconds
[ 16.033999] cloud-init[1364]: 2024-01-03 04:28:16,425 - cc_final_message.py[WARNING]: Used fallback datasource

backend001 login: devuser
Password: _
```

```
devuser@backend001:~$ ifconfig
enp0s5: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.211.55.4 netmask 255.255.255.0 broadcast 10.211.55.255
                inet6 fdb2:2c26:f4e4:0:21c:42ff:fe7:ebf2 prefixlen 64 scopeid 0x0<global>
                inet6 fe80::21c:42ff:fe7:ebf2 prefixlen 64 scopeid 0x20<link>
        ether 00:1c:42:c7:eb:f2 txqueuelen 1000 (Ethernet)
        RX packets 343 bytes 367441 (367.4 KB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 278 bytes 24699 (24.6 KB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
                inet6 ::1 prefixlen 128 scopeid 0x10<host>
        loop txqueuelen 1000 (Local Loopback)
        RX packets 114 bytes 9225 (9.2 KB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 114 bytes 9225 (9.2 KB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

ทำการ add user

```
devuser@backend001:~$ adduser lertpisit
```

ให้สิทธิ การใช้ sudo กับ user ใหม่

```
devuser@backend001:~$ usermod -aG sudo lertpisit
```

เปิด ssh

```
lertpisit@backend001:~$ sudo ufw allow OpenSSH
Rules updated
Rules updated (v6)
```

เปิด Firewall

```
lertpisit@backend001:~$ sudo ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
```

ดู status

```
lertpisit@backend001:~$ sudo ufw status
Status: active

To                         Action      From
--                         --          --
OpenSSH                      ALLOW       Anywhere
OpenSSH (v6)                  ALLOW       Anywhere (v6)
```

ทำการ update ubuntu ด้วย คำสั่ง ด้านล่าง

```
sudo apt update
sudo apt list --upgradable
sudo apt upgrade
```

ทำการลง Mysql

ทำการค้นหา mysql

```
lertpisit@backend001:~$ apt-cache search mysql-server
mysql-server - MySQL database server (metapackage depending on the latest version)
mysql-server-8.0 - MySQL database server binaries and system database setup
mysql-server-core-8.0 - MySQL database server binaries
default-mysql-server - MySQL database server binaries and system database setup (metapackage)
default-mysql-server-core - MySQL database server binaries (metapackage)
mariadb-server-10.6 - MariaDB database server binaries
mariadb-server-core-10.6 - MariaDB database core server files
```

ดูข้อมูล ของ mysql 8.0

```
lertpisit@backend001:~$ apt info -a mysql-server-8.0
Package: mysql-server-8.0
Version: 8.0.35-0ubuntu0.22.04.1
Priority: optional
Section: database
Source: mysql-8.0
Origin: Ubuntu
```

ทำการติดตั้ง Mysql

```
lertpisit@backend001:~$ sudo apt install mysql-server-8.0
[sudo] password for lertpisit:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libclone-perl libencode-locale-perl
  liblwp-mediatypes-perl libmecab2 libprotobuf-lite23 libtimedate-perl
Suggested packages:
  libdata-dump-perl libipc-sharedcache-perl libbusiness-isbn-perl lib
The following NEW packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libclone-perl libencode-locale-perl
  liblwp-mediatypes-perl libmecab2 libprotobuf-lite23 libtimedate-perl
0 upgraded, 27 newly installed, 0 to remove and 7 not upgraded.
Need to get 28.9 MB of archives.
After this operation, 238 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

เข้าไปใน mysql

```
lertpisit@backend001:~$ sudo mysql
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.35-0ubuntu0.22.04.1 (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> █
```

ทำการตั้งค่าความปลอดภัย

```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'P@ssw0rd';
```

ทำการตั้งค่าความปลอดภัย

```
lertpisit@backend001:~$ sudo mysql_secure_installation
```

```
Securing the MySQL server deployment.
```

```
Enter password for user root:
```

```
VALIDATE PASSWORD COMPONENT can be used to test passwords  
and improve security. It checks the strength of password  
and allows the users to set only those passwords which are  
secure enough. Would you like to setup VALIDATE PASSWORD component?
```

```
Press y|Y for Yes, any other key for No: y
```

```
There are three levels of password validation policy:
```

```
LOW    Length >= 8  
MEDIUM Length >= 8, numeric, mixed case, and special characters  
STRONG Length >= 8, numeric, mixed case, special characters and dictionary file
```

```
Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 2  
Using existing password for root.
```

```
Estimated strength of the password: 100
```

```
Change the password for root ? ((Press y|Y for Yes, any other key for No) : n
```

```
... skipping.  
By default, a MySQL installation has an anonymous user,  
allowing anyone to log into MySQL without having to have  
a user account created for them. This is intended only for  
testing, and to make the installation go a bit smoother.  
You should remove them before moving into a production  
environment.
```

```
Remove anonymous users? (Press y|Y for Yes, any other key for No) : y  
Success.
```

```
Normally, root should only be allowed to connect from  
'localhost'. This ensures that someone cannot guess at  
the root password from the network.
```

```
Disallow root login remotely? (Press y|Y for Yes, any other key for No) : y  
Success.
```

```
By default, MySQL comes with a database named 'test' that  
anyone can access. This is also intended only for testing,  
and should be removed before moving into a production  
environment.
```

```
Remove test database and access to it? (Press y|Y for Yes, any other key for No) : y  
- Dropping test database...  
Success.
```

```
- Removing privileges on test database...  
Success.
```

```
Reloading the privilege tables will ensure that all changes  
made so far will take effect immediately.
```

```
Reload privilege tables now? (Press y|Y for Yes, any other key for No) : y  
Success.
```

ทำการเปิด mysql

```
lertpisit@backend001:~$ sudo systemctl is-enabled mysql.service
enabled
lertpisit@backend001:~$ sudo systemctl status mysql.service
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-01-03 06:39:39 UTC; 7min ago
     Process: 1788 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
   Main PID: 1788 (mysqld)
      Status: "Server is operational"
        Tasks: 38 (limit: 2191)
       Memory: 365.2M
          CPU: 3.064s
         CGroup: /system.slice/mysql.service
                   └─1788 /usr/sbin/mysqld

Jan 03 06:39:38 backend001 systemd[1]: Starting MySQL Community Server...
Jan 03 06:39:39 backend001 systemd[1]: Started MySQL Community Server.
```

ทำการลง nginx

ทำการ update และ upgrade

```
lertpisit@backend001:~$ sudo apt update && sudo apt upgrade
Hit:1 http://ports.ubuntu.com/ubuntu-ports jammy InRelease
Get:2 http://ports.ubuntu.com/ubuntu-ports jammy-updates InRelease [119 kB]
Hit:3 http://ports.ubuntu.com/ubuntu-ports jammy-backports InRelease
Get:4 http://ports.ubuntu.com/ubuntu-ports jammy-security InRelease [110 kB]
Fetched 226 kB in 2s (116 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
7 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages have been kept back:
  distro-info distro-info-data python3-distro-info python3-software-properties python3-update-manager software-properties-common update-manager-core
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
lertpisit@backend001:~$
```

ทำการติดตั้ง nginx

```
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
lertpisit@backend001:~$ sudo apt install nginx certbot python3-certbot-nginx
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  fontconfig-config fonts-dejavu-core libdeflate0 libfontconfig1 libgd3 libjbig
  libnginx-mod-stream-geoip2 libtiff5 libwebp7 libxpm4 nginx-common nginx-core
  python3-zope.event python3-zope.hookable
Suggested packages:
  python-certbot-doc python3-certbot-apache libgd-tools fcgiwrap nginx-doc ssl-
The following NEW packages will be installed:
  certbot fontconfig-config fonts-dejavu-core libdeflate0 libfontconfig1 libgd3
  libnginx-mod-stream-geoip2 libtiff5 libwebp7 libxpm4 nginx nginx-common nginx-
  python3-zope.component python3-zope.event python3-zope.hookable
0 upgraded, 33 newly installed, 0 to remove and 7 not upgraded.
Need to get 3,606 kB of archives.
After this operation, 12.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

เปิด nginx บน firewall

```
lertpisit@backend001:~$ sudo ufw allow 'Nginx Full'
Rule added
Rule added (v6)
```

เข้าไปดูใน localhost บน browser



Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

ทำการลง node

ทำการ update

```
lertpisit@backend001:~$ sudo apt-get update
Hit:1 http://ports.ubuntu.com/ubuntu-ports jammy InRelease
Get:2 http://ports.ubuntu.com/ubuntu-ports jammy-updates InRelease [119 kB]
Hit:3 http://ports.ubuntu.com/ubuntu-ports jammy-backports InRelease
Get:4 http://ports.ubuntu.com/ubuntu-ports jammy-security InRelease [110 kB]
Fetched 229 kB in 3s (84.5 kB/s)
Reading package lists... Done
```

ทำการ ติดตั้ง certificates

```
lertpisit@backend001:~$ sudo apt-get install -y ca-certificates curl gnupg
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20230311ubuntu0.22.04.1).
ca-certificates set to manually installed.
curl is already the newest version (7.81.0-1ubuntu1.15).
curl set to manually installed.
gnupg is already the newest version (2.2.27-3ubuntu2.1).
gnupg set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
```

ทำการสร้าง folder ชื่อ keyrings

```
lertpisit@backend001:~$ sudo mkdir -p /etc/apt/keyrings
```

ทำการ โหลด nodesource-repo.gpg.key ไปที่ใน /etc/apt/keyrings/nodesource.gpg

```
lertpisit@backend001:~$ curl -fsSL https://deb.nodesource.com/gpgkey/nodesource-repo.gpg.key | sudo gpg --dearmor -o /etc/apt/keyrings/nodesource.gpg
```

กำหนด เวอร์ชัน เป็น 20

```
lertpisit@backend001:~$ NODE_MAJOR=20
```

เพิ่มที่เก็บ Node.js ลงในระบบปฏิบัติการ Ubuntu

```
lertpisit@backend001:~$ echo "deb [signed-by=/etc/apt/keyrings/nodesource.gpg] https://deb.nodesource.com/node_$NODE_MAJOR.x nodistro main" | sudo tee /etc/apt/sources.list.d/nodesource.list
```

ทำการ update

```
lertpisit@backend001:~$ sudo apt-get update
Get:1 https://deb.nodesource.com/node_20.x nodistro InRelease [12.1 kB]
Get:2 https://deb.nodesource.com/node_20.x nodistro/main arm64 Packages [4,685 B]
Hit:3 http://ports.ubuntu.com/ubuntu-ports jammy InRelease
Hit:4 http://ports.ubuntu.com/ubuntu-ports jammy-updates InRelease
Hit:5 http://ports.ubuntu.com/ubuntu-ports jammy-backports InRelease
Hit:6 http://ports.ubuntu.com/ubuntu-ports jammy-security InRelease
Fetched 16.8 kB in 1s (14.3 kB/s)
Reading package lists... Done
```

ทำการติดตั้ง nodejs

```
lertpisit@backend001:~$ sudo apt-get install nodejs -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  nodejs
```

ทำการติดตั้งเวอร์ชันของ node และ npm

```
lertpisit@backend001:~$ node -v
v20.10.0
lertpisit@backend001:~$ npm -v
10.2.3
```

ทำการสร้าง folder lab4

```
lertpisit@webserver001:~$ sudo mkdir -p /var/www/lab4
```

เข้าไปใน folder lab4

```
lertpisit@webserver001:~$ cd /var/www/lab4
```

ทำการสร้าง folder nodelogin

```
lertpisit@webserver001:/var/www/lab4$ sudo mkdir -p nodelogin
```

ทำการเปลี่ยนสิทธิ เมิน user ที่ใช้อู่

```
lertpisit@webserver001:/var/www/lab4$ sudo chown -R $USER:$USER /var/www/lab4
```

เข้าไปใน folder nodelogin

```
lertpisit@webserver001:/var/www/lab4$ cd nodelogin
```

สร้างไฟล์ package.json ด้วย npm init

```
lertpisit@webserver001:/var/www/lab4/nodelogin$ npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See `npm help init` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.

Press ^C at any time to quit.
package name: (nodelogin)
version: (1.0.0)
description:
entry point: (index.js)
test command:
git repository:
keywords:
author:
license: (ISC)
About to write to /var/www/lab4/nodelogin/package.json:

{
  "name": "nodelogin",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \\\"Error: no test specified\\\" && exit 1"
  },
  "author": "",
  "license": "ISC"
}

Is this OK? (yes) y
npm notice
npm notice New patch version of npm available! 10.2.3 -> 10.2.5
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.2.5
npm notice Run npm install -g npm@10.2.5 to update!
npm notice
```

ทำงานตัวเสริม

ทำการติดตั้ง express

```
lertpisit@webserver001:/var/www/lab4/nodelogin$ npm install express --save
added 62 packages, and audited 63 packages in 2s

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

found 0 vulnerabilities
```

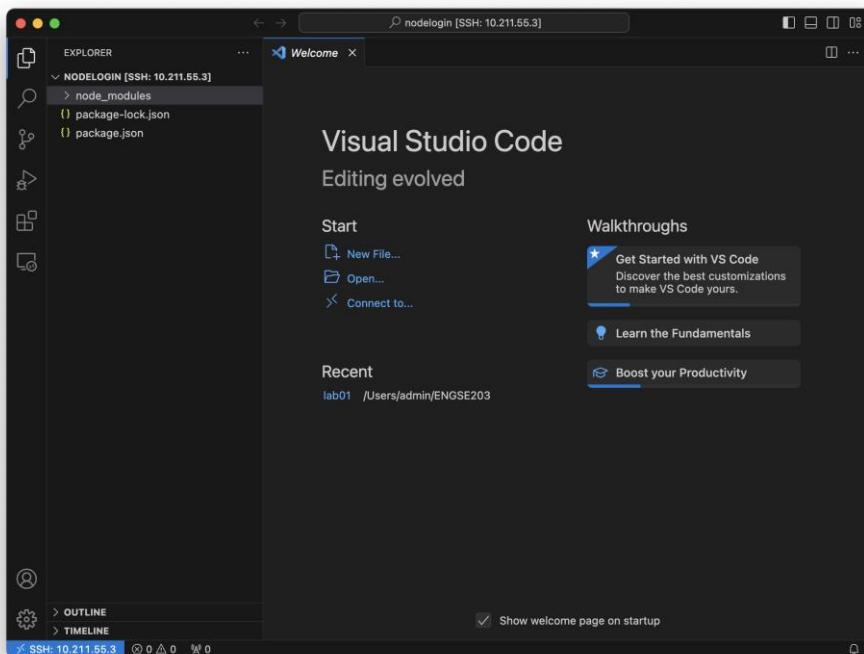
ทำการติดตั้ง express-session

```
lertpisit@webserver001:/var/www/lab4/nodelogin$ npm install express-session --save
added 5 packages, and audited 68 packages in 965ms
11 packages are looking for funding
  run `npm fund` for details
found 0 vulnerabilities
```

ทำการติดตั้ง mysql

```
lertpisit@webserver001:/var/www/lab4/nodelogin$ npm install mysql --save
added 12 packages, and audited 80 packages in 2s
11 packages are looking for funding
  run `npm fund` for details
found 0 vulnerabilities
```

เปิด vs code และทำการ ssh ไปยัง ubuntu



ทำการสร้างไฟล์ style.css , login.html , login.js

```
✓ static
| # style.css
<> login.html
JS login.js
```

```
# style.css  X  login.html  JS login.js
static > # style.css  ↗
1  * {
2     box-sizing: border-box;
3     font-family: -apple-system, BlinkMacSystemFont, "segoe ui", roboto, oxygen, ubuntu, cantarell, "fira sans", "droid sans", "helvetica neue", Arial, sans-serif;
4     font-size: 16px;
5 }
6 body {
7     background-color: #435165;
8 }
9 .login {
10    width: 400px;
11    background-color: #ffffff;
12    box-shadow: 0 0 9px 0 rgba(0, 0, 0, 0.3);
13    margin: 100px auto;
14 }
15 .login h1 {
16    text-align: center;
17    color: #5b6574;
18    font-size: 24px;
19    padding: 20px 0 20px 0;
20    border-bottom: 1px solid #dee0e4;
21 }
22 .login form {
23    display: flex;
24    flex-wrap: wrap;
25    justify-content: center;
26    padding-top: 20px;
27 }
28 .login form label {
29    display: flex;
30    justify-content: center;
31    align-items: center;
32    width: 50px;
33    height: 50px;
34    background-color: #3274d6;
35    color: #fffffe;
36 }
37 .login form input[type="password"], .login form input[type="text"] {
38    width: 310px;
39    height: 50px;
40    border: 1px solid #dee0e4;
41    margin-bottom: 20px;
42    padding: 0 15px;
43 }
44 .login form input[type="submit"] {
45    width: 100px;
46    padding: 15px;
47    margin-top: 20px;
48    background-color: #3274d6;
49    border: 0;
50    cursor: pointer;
51    font-weight: bold;
52    color: #fffffe;
53    transition: background-color 0.2s;
54 }
55 .login form input[type="submit"]:hover {
56    background-color: #2868c7;
57    transition: background-color 0.2s;
58 }
```

```
# style.css      login.html      JS login.js
# style.css      login.html > ↗ html      JS login.js
1  <!DOCTYPE html>
2  <html>
3      <head>
4          <meta charset="utf-8">
5          <meta name="viewport" content="width=device-width,minimum-scale=1">
6          <title>Login</title>
7          <!-- the font awesome library is used to add icons to our form -->
8          <link rel="stylesheet" href="https://use.fontawesome.com/releases/v5.7.1/css/all.css">
9          <!-- include the stylesheet file -->
10         <link href="/style.css" rel="stylesheet" type="text/css">
11     </head>
12     <body>
13         <div class="login">
14             <h1>Login</h1>
15             <form action="/auth" method="post">
16                 <label for="username">
17                     <!-- font awesome icon -->
18                     <i class="fas fa-user"></i>
19                 </label>
20                 <input type="text" name="username" placeholder="Username" id="username" required>
21                 <label for="password">
22                     <i class="fas fa-lock"></i>
23                 </label>
24                 <input type="password" name="password" placeholder="Password" id="password" required>
25                 <input type="submit" value="Login">
26             </form>
27         </div>
28     </body>
29 </html>
```

```
# style.css      login.html      JS login.js > [0] connection
# style.css      login.html      JS login.js > [0] connection
1  const mysql = require('mysql');
2  const express = require('express');
3  const session = require('express-session');
4  const path = require('path');
5
6  const connection = mysql.createConnection([
7      host : 'localhost',
8      user : 'example_user',
9      password : 'P@ssw0rd@2023',
10     database : 'nodeLogin'
11 ]);
12
13 const app = express();
14
15 app.use(session({
16     secret: 'secret',
17     resave: true,
18     saveUninitialized: true
19 }));
20 app.use(express.json());
21 app.use(express.urlencoded({ extended: true }));
22 app.use(express.static(path.join(__dirname, 'static')));
23
24 // http://localhost:3003/
25 app.get('/', function(request, response) {
26     // Render Login template
27     response.sendFile(path.join(__dirname + '/login.html'));
28 });
29
30 // http://localhost:3003/auth
31 app.post('/auth', function(request, response) {
32     // Capture the input fields
33     let username = request.body.username;
34     let password = request.body.password;
35     // Ensure the input fields exists and are not empty
36     if (username && password) {
37         // Execute SQL query that'll select the account from the database based on the specified username and password
38         connection.query('SELECT * FROM accounts WHERE username = ? AND password = ?', [username, password], function(error, results, fields) {
39             // If there is an issue with the query, output the error
40             if (error) throw error;
41             // If the account exists
42             if (results.length > 0) {
43                 // Authenticate the user
44                 request.session.loggedin = true;
45                 request.session.username = username;
46                 // Redirect to home page
47                 response.redirect('/home');
48             } else {
49                 response.send('Incorrect Username and/or Password!');
50             }
51             response.end();
52         });
53     } else {
54         response.send('Please enter Username and Password!');
55         response.end();
56     }
57 });
```

```
59 // http://localhost:3003/home
60 app.get('/home', function(request, response) {
61     // If the user isloggedin
62     if (request.session.loggedin) {
63         // Output username
64         response.send('Welcome back, ' + request.session.username + '!');
65     } else {
66         // Not logged in
67         response.send('Please login to view this page!');
68     }
69     response.end();
70 });
71
72 app.listen(3003);
```

ทำการเข้า mysql ด้วย root

```
lertp@webserver001:/var/www/lab4/nodelogin$ sudo mysql -u root -p
```

สร้าง user example_user รหัส P@ssw0rd@2023

```
mysql> CREATE USER 'example_user'@'%' IDENTIFIED BY 'P@ssw0rd@2023';
```

เปลี่ยน รหัสของ root เป็น P@ssw0rd@2023

```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'P@ssw0rd@2023';
```

ทำการสร้าง database ชื่อ nodelogin

```
mysql> CREATE DATABASE IF NOT EXISTS `nodelogin` DEFAULT CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected, 2 warnings (0.00 sec)
```

ติดตั้งหน้าผู้ใช้ example_user บนตาราง nodelogin

```
mysql> GRANT ALL ON nodelogin.* TO 'example_user'@'%';
```

ทำการ native password ของ example_user

```
mysql> ALTER USER 'example_user'@'%' IDENTIFIED WITH mysql_native_password BY 'P@ssw0rd@2023';
Query OK, 0 rows affected (0.01 sec)
```

ทำการใช้ database nodelogin

```
mysql> USE nodelogin;
Database changed
```

สร้าง table ชื่อ accounts

```
mysql> CREATE TABLE IF NOT EXISTS `accounts` (
->   `id` int(11) NOT NULL AUTO_INCREMENT,
->   `username` varchar(50) NOT NULL,
->   `password` varchar(255) NOT NULL,
->   `email` varchar(100) NOT NULL,
->   PRIMARY KEY (`id`)
-> ) ENGINE=InnoDB AUTO_INCREMENT=2 DEFAULT CHARSET=utf8;
Query OK, 0 rows affected, 2 warnings (0.02 sec)
```

ทำการ insert ข้อมูล

```
mysql> INSERT INTO `accounts` (`id`, `username`, `password`, `email`) VALUES (1, 'test', 'test', 'test@test.com');
```

ทำให้สิทธิ์ผู้ใช้ทั้งหมดที่แก้ไขในตาราง จะถูกโหลดลงในหน่วยความจำของเซิร์ฟเวอร์ MySQL

```
mysql> FLUSH PRIVILEGES;
```

ออก mysql

```
mysql> exit
Bye
```

เปิด port 3003

```
lertpisit@webserver001:/var/www/lab4/nodelogin$ sudo ufw allow 3003
Rule added
Rule added (v6)
```

ไปที่ /etc/nginx/sites-available

```
lertpisit@webserver001:/var/www/lab4/nodelogin$ cd /etc/nginx
lertpisit@webserver001:/etc/nginx$ cd sites-available/
```

ทำการ copy myapp เป็น nodelogin

```
lertpisit@webserver001:/etc/nginx/sites-available$ sudo cp myapp nodelogin
```

ทำการแก้ไข nodelogin

```
lertpisit@webserver001:/etc/nginx/sites-available$ sudo nano nodelogin
```

เปลี่ยน servername และ port 3003

```

GNU nano 6.2
server {
    listen 80;
    listen [::]:80;

    server_name nodelogin.se-rmutil.net;

    location / {
        proxy_pass http://127.0.0.1:3003; # !!! - 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;
    }
}

```

ไปยัง local terminal ของ mac และแก้ไขไฟล์ hosts

admin@admins-iMac ~ % sudo nano /etc/hosts

เพิ่มชื่อ nodelogin.se-rmutil.net ตรง ip 10.211.55.3

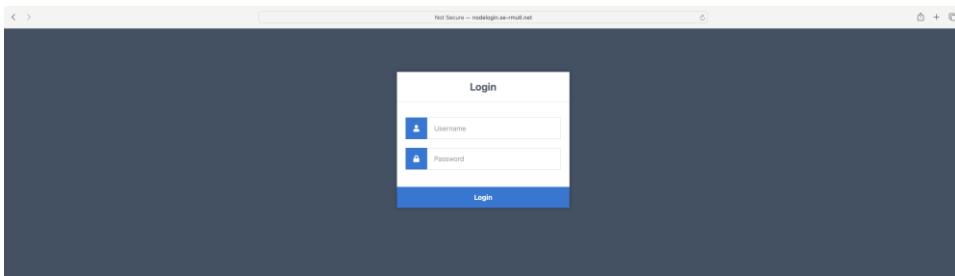
```

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 engse203.lab1
255.255.255.255 broadcasthost
::1             localhost
10.211.55.3    expressjs.se-rmutil.net myapp.se-rmutil.net react.se-rmutil.net
10.211.55.3    my-react-app.se-rmutil.net ubuntu-next-app.se-rmutil.net nodelogin.se-rmutil.net

```

เข้าไปดูใน browser โดยพิมพ์ชื่อ nodelogin.se-rmutil.net



รูปหลังเข้า login



ทำการ insert accounts เพิ่ม

```

mysql> USE nodelogin;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
Database changed
mysql> INSERT INTO `accounts` (`id`, `username`, `password`, `email`) VALUES (2, 'test2', 'test2', 'test2@test.com');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `accounts` (`id`, `username`, `password`, `email`) VALUES (3, 'lertpisit', 'fiew1234', 'test2@test.com');
Query OK, 1 row affected (0.01 sec)

```

รูปหลังเข้า login ด้วย accounts อีก



ทำการสร้าง folder ชื่อ client

```
lertpisit@webserver001:/var/www/lab4$ mkdir client
```

เข้าไปใน client

```
lertpisit@webserver001:/var/www/lab4$ cd client/  
lertpisit@webserver001:/var/www/lab4/client$
```

ทำการลง react

```
lertpisit@webserver001:/var/www/lab4/client$ npx create-react-app .
```

เข้าvscode และ เข้าไปแก้ไขไฟล์ app.css , app.js , index.js

```
# App.css  X  JS App.js  JS index.js
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 }
```

```
# App.css  JS App.js  JS index.js  X
client > src > JS index.js
1 import React from 'react';
2 import ReactDOM from 'react-dom';
3 import './App.css';
4 import App from './App';
5
6 ReactDOM.render(
7   |   <React.StrictMode>
8   |   |   <App />
9   |   </React.StrictMode>,
10  |   document.getElementById('root')
11 );
12 
```

```
JS App.js  X
src > JS App.js > ⚡ App > register
1 import React, { useEffect, useState } from "react";
2 import Axios from 'axios';
3 import './App.css';
4
5 function App() {
6
7   const [usernameReg, setUsernameReg] = useState("");
8   const [passwordReg, setPasswordReg] = useState ("");
9
10  const [username, setUsername] = useState("");
11  const [password, setPassword] = useState ("");
12
13  const [loginStatus, setLoginStatus] = useState("");
14
15  const register = () => {
16    Axios.post("http://10.211.55.3:4000/register",
17      {
18        username: usernameReg,
19        password: passwordReg,
20      }
21    ).then((response) => {
22      console.log(response);
23
24      if (!response.data.err) {
25        setLoginStatus("'" +usernameReg + "' was inserted.");
26      } else {
27        setLoginStatus(response.data.err.sqlMessage);
28      }
29    });
30
31
32  const login = () => {
33    Axios.post("http://10.211.55.3:4000/login", {
34      {
35        username: username,
36        password: password,
37      }
38    }).then((response) => {
39      console.log(response);
40      //console.log("response.data.message: "+response.data[0].message);
41
42      if (!response.data.message) {
43        setLoginStatus("'" +response.data[0].username + "' was logged in.");
44      } else {
45        setLoginStatus(response.data.message);
46      }
47    });
48  };
49}
```

```

40
49   return (
50     <div className="App">
51       <div className="registration">
52         <h1>Registration</h1>
53         <label>Username</label>
54         <input
55           type="text"
56           onChange={(e) => {
57             setUsernameReg(e.target.value);
58           }}
59         /><br/>
60         <label>password</label>
61         <input
62           type="text"
63           onChange={(e) => {
64             setPasswordReg(e.target.value);
65           }}
66         /> <br />
67         <button onClick={register}> Register</button>
68       </div>
69
70       <div className="login">
71         <h1>Login</h1>
72         <input
73           type="text"
74           placeholder="Username..."
75           onChange = { (e) => {
76             setUsername (e.target.value);
77           }}
78         /> <br/>
79         <input
80           type="password"
81           placeholder="Password..."
82           onChange = { (e) => {
83             setPassword (e.target.value);
84           }}
85         />
86         <button onClick={login}>Login</button>
87       </div>
88       <h1> {loginStatus}</h1>
89     </div>
90   );
91 }
92
93 export default App;

```

ทำการลง axios

```

lertpiset@webserver001:/var/www/lab4/client$ npm i --save axios

added 3 packages, and audited 1556 packages in 2s

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

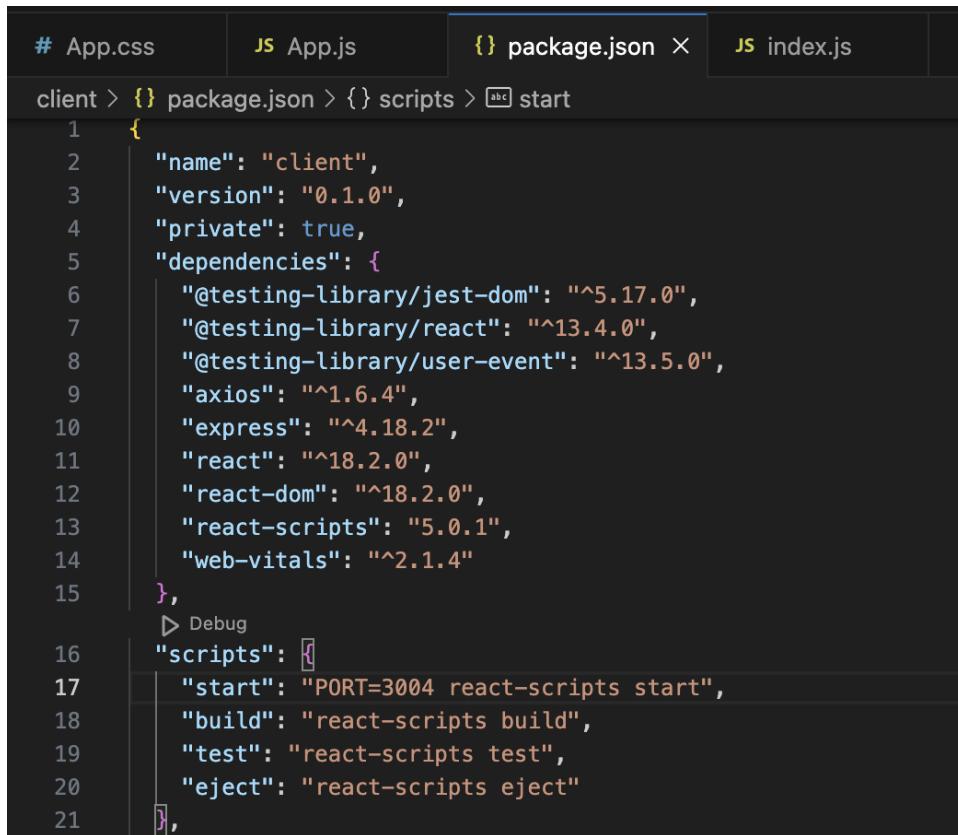
8 vulnerabilities (2 moderate, 6 high)

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.

```

ทำการ กำหนด port เป็น 3004



```
# App.css          JS App.js          {} package.json ×   JS index.js
client > {} package.json > {} scripts > start
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": "^1.6.4",
10     "express": "^4.18.2",
11     "react": "^18.2.0",
12     "react-dom": "^18.2.0",
13     "react-scripts": "5.0.1",
14     "web-vitals": "^2.1.4"
15   },
16   ▷ Debug
17   "scripts": [
18     "start": "PORT=3004 react-scripts start",
19     "build": "react-scripts build",
20     "test": "react-scripts test",
21     "eject": "react-scripts eject"
22   ],
23 }
```

เปิด port 3004

```
lertpisit@webserver001:/etc/nginx/sites-available$ sudo ufw allow 3004
Rule added
Rule added (v6)
```

ไปที่ /etc/nginx/sites-available ทำการ copy myapp เป็น client

```
lertpisit@webserver001:~$ cd /etc/nginx
lertpisit@webserver001:/etc/nginx$ cd sites-available/
lertpisit@webserver001:/etc/nginx/sites-available$ sudo cp myapp client
```

ทำการแก้ไข client

```
lertpisit@webserver001:/etc/nginx/sites-available$ sudo nano client
```

เปลี่ยน servername weblogin.ser-mutl.net และ port 3004



```
GNU nano 6.2
server {
  listen 80;
  listen [::]:80;
  server_name weblogin.ser-mutl.net;

  location / {
    proxy_pass http://127.0.0.1:3004; # !!! - 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;
  }
}
```

ไปยัง local terminal ของ mac และ แก้ไขไฟล์ hosts

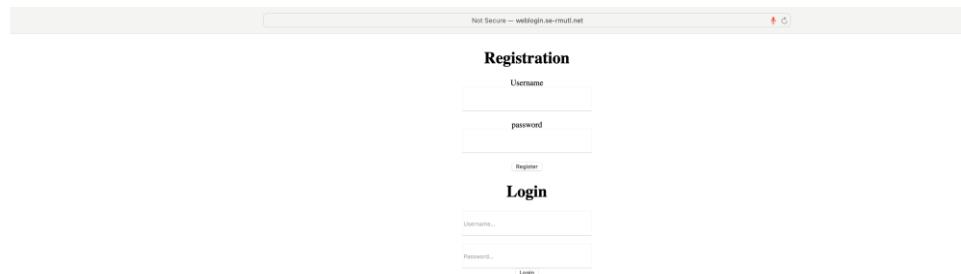
```
admin@admins-iMac ~ % sudo nano /etc/hosts
```

เพิ่มชื่อ weblogin.se-rmutil.net ตรง ip 10.211.55.3

```
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 engse203.lab1
255.255.255.255 broadcasthost
::1           localhost
10.211.55.3    expressjs.se-rmutil.net myapp.se-rmutil.net react.se-rmutil.net weblogin.se-rmutil.net
10.211.55.3    my-react-app.se-rmutil.net ubuntu-next-app.se-rmutil.net nodelogin.se-rmutil.net
```

เข้าไปใน browser โดยพิมพ์ชื่อ weblogin.se-rmutil.net



ทำการสร้าง folder server ใน lab 4

```
lertpisit@webserver001:/var/www/lab4$ mkdir server
```

เข้าไปใน server สร้างไฟล์ package.json ด้วย npm init

```
lertpisit@webserver001:/var/www/lab4$ cd server/
lertpisit@webserver001:/var/www/lab4/server$ npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See `npm help init` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.

Press ^C at any time to quit.
package name: (server)
version: (1.0.0)
description:
entry point: (index.js)
test command:
git repository:
keywords:
author:
license: (ISC)
About to write to /var/www/lab4/server/package.json:

{
  "name": "server",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \\\"Error: no test specified\\\" && exit 1"
  },
  "author": "",
  "license": "ISC"
}

Is this OK? (yes) y
```

ทำการสร้าง index.js

```
JS index.js ×
js index.js > ⚡ app.post('/login') callback > ⚡ db.execute("SELECT * FROM users WHERE username = ? AND password = ?") callback > ⚡ err
1  const express = require("express");
2  const mysql = require("mysql2");
3  const cors = require("cors");
4
5  const app = express();
6
7  const db = mysql.createConnection({
8      host: 'localhost',
9      user: 'example_user',
10     password: 'P@ssw0rd@2023',
11     database: 'Loginsystem',
12   });
13
14 app.use(express.json());
15 app.use(
16   cors({
17     origin: ["http://weblogin.se-rmutil.net"],
18     methods: ["GET", "POST"],
19     credentials: true,
20   })
21 );
22
23 app.get('/', (req, res) => {
24   console.log("Hello from API!");
25 });
26
27 app.post('/login', (req, res) => {
28   let username = req.body.username;
29   let password = req.body.password;
30
31   console.log("body: "+ JSON.stringify(req.body));
32
33   console.log("username: "+username);
34   console.log("password: "+password);
35
36   db.execute(
37     "SELECT * FROM users WHERE username = ? AND password = ?",
38     [username, password],
39     (err, result) => {
40       if (err) {
41         if (err) {
42           res.send({ err: err });
43         }
44         if (result.length > 0) {
45           res.send(result);
46         } else {
47           res.send({ message: "Wrong username/password combination!" });
48         }
49       }
50     });
51   });
52
```

```

51
52 app.post('/register', (req, res) => {
53   let username = req.body.username;
54   let password = req.body.password;
55
56   console.log("body: "+ JSON.stringify(req.body));
57
58   console.log("username: "+username);
59   console.log("password: "+password);
60
61   db.execute(
62     "INSERT INTO users (username, password) VALUES (?,?)",
63     [username, password],
64     (err, result) => {
65       if (err) {
66         res.send({ err: err });
67       }
68       res.send(result);
69     }
70   );
71 });
72
73
74 app.listen(4000, () => {
75   console.log("running server");
76 });

```

ทำการลง express

```

lertpisit@webserver001:/var/www/lab4/server$ npm install express --save
added 62 packages, and audited 63 packages in 12s

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

```

เข้า mysql ด้วย root

```

lertpisit@webserver001:/var/www/Lab4/server$ sudo mysql -u root -p
[sudo] password for lertpisit:
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.35-0ubuntu0.22.04.1 (Ubuntu)

```

ทำการสร้าง database ชื่อ loginsystem

```

mysql> CREATE DATABASE IF NOT EXISTS `loginsystem` DEFAULT CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected, 2 warnings (0.00 sec)

```

ใช้ database loginsystem

```
mysql> USE loginsystem;
Database changed
```

สร้าง table ชื่อ users

```
mysql> CREATE TABLE IF NOT EXISTS `users`(
    ->   `username` varchar(50) NOT NULL,
    ->   `password` varchar(500) NOT NULL,
    ->   PRIMARY KEY (`username`)
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
Query OK, 0 rows affected, 1 warning (0.02 sec)
```

ทำการ insert ข้อมูลลงไปใน users

```
mysql> INSERT INTO `users` (`username`, `password`) VALUES ('test', 'test');
Query OK, 1 row affected (0.00 sec)
```

ทำการ สิทธิ์ทั้งหมดให้กับผู้ใช้ example_user บนตาราง loginsystem

```
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

Database changed
mysql> GRANT ALL ON loginsystem.* TO 'example_user'@'%';
Query OK, 0 rows affected (0.01 sec)
```

ลง cors

```
lertpisit@webserver001:/var/www/lab4/server$ npm i -- save cors
added 14 packages, and audited 77 packages in 3s

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

found 0 vulnerabilities
```

ลง nodemon

```
lertpisit@webserver001:/var/www/lab4/server$ sudo npm install -g nodemon
changed 33 packages in 1s

3 packages are looking for funding
  run `npm fund` for details
npm notice
npm notice New patch version of npm available! 10.2.3 -> 10.2.5
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.2.5
npm notice Run npm install -g npm@10.2.5 to update!
npm notice
```

เปิด port 4000

```
lertpisit@webserver001:~$ sudo ufw allow 4000
[sudo] password for lertpisit:
Rule added
Rule added (v6)
```

ทำการ เปิด server ด้วย nodemon index.js

```
^Clertpisit@webserver001:/var/www/lab4/server$ nodemon index.js
[nodemon] 3.0.2
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): ***!
[nodemon] watching extensions: js,mjs,cjs,json
[nodemon] starting `node index.js`
running server
```

ทำการ เปิด client ด้วย npm start

```
lertpisit@webserver001:/var/www/lab4/client$ npm start
```

```
Compiled successfully!
```

```
You can now view client in the browser.
```

```
Local:          http://localhost:3004
On Your Network: http://10.211.55.3:3004
```

```
Note that the development build is not optimized.
To create a production build, use npm run build.
```

```
webpack compiled successfully
```

ลองเข้าไปทดลองใช้ระบบ

A screenshot of a web browser window titled "React App". The address bar shows "Not Secure" and "weblogin.se-rmut.net". The page contains two forms: a "Registration" form with fields for "Username" and "password", and a "Login" form with fields for "Username..." and "Password...". A "Register" button is located between the two forms.

Registration

Username

password

Register

Login

Username...

Password...

Login

A screenshot of a web browser window titled "React App". The address bar shows "Not Secure" and "weblogin.se-rmut.net". The page contains two forms: a "Registration" form with fields for "Username" and "password", and a "Login" form with fields for "Username..." and "Password...". A "Register" button is located between the two forms. Below the forms, a message reads "'fiew' was inserted."

Registration

Username

password

Register

Login

Username...

Password...

Login

'fiew' was inserted.

A screenshot of a web browser window titled "React App". The address bar shows "Not Secure" and "weblogin.se-rmut.net". The page contains two forms: a "Registration" form with fields for "Username" and "password", and a "Login" form with fields for "Username..." and "Password...". A "Register" button is located between the two forms. Below the forms, a message reads "'fiew' was logged in."

Registration

Username

password

Register

Login

Username...

Password...

Login

'fiew' was logged in.

ทำการสร้าง folder lab 4 และ เข้าไปใน lab 4

```
lertpisit@backend001:~$ cd /var/www/lab4
```

ทำการสร้าง folder server

```
lertpisit@backend001:/var/www/lab4$ mkdir server
```

เข้าไปใน server สร้างไฟล์ package.json ด้วย npm init

```
lertpisit@backend001:/var/www/lab4$ cd server/
lertpisit@backend001:/var/www/lab4/server$ npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See `npm help init` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.

Press ^C at any time to quit.
package name: (server)
version: (1.0.0)
description:
entry point: (index.js)
test command:
git repository:
keywords:
author:
license: (ISC)
About to write to /var/www/lab4/server/package.json:

{
  "name": "server",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \\\"Error: no test specified\\\" && exit 1"
  },
  "author": "",
  "license": "ISC"
}

Is this OK? (yes) y
```

ลง express

```
lertpisit@backend001:/var/www/lab4/server$ npm install express --save
added 62 packages, and audited 63 packages in 2s

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

found 0 vulnerabilities
```

ลง mysql2

```
lertpisit@backend001:/var/www/lab4/server$ npm install --save mysql2
added 11 packages, and audited 74 packages in 984ms

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

found 0 vulnerabilities
```

ลง cors

```
lertpisit@backend001:/var/www/lab4/server$ npm i --save cors
added 2 packages, and audited 76 packages in 734ms

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

found 0 vulnerabilities
```

ลง nodemon

```
lertpisit@backend001:/var/www/lab4/server$ sudo npm install -g nodemon
[sudo] password for lertpisit:

added 33 packages in 2s

3 packages are looking for funding
  run `npm fund` for details
npm notice
npm notice New patch version of npm available! 10.2.3 -> 10.2.5
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.2.5
npm notice Run npm install -g npm@10.2.5 to update!
npm notice
```

เข้า mysql ด้วย root

```
lertpisit@backend001:/var/www/lab4/server$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.35-Ubuntu0.22.04.1 (Ubuntu)

Copyright (c) 2000-2022 Oracle and/or its affiliates
```

สร้าง user ชื่อ example_user รหัส P@ssw0rd@2023

```
mysql> CREATE USER 'example_user'@'%' IDENTIFIED BY 'P@ssw0rd@2023';
Query OK, 0 rows affected (0.03 sec)
```

ทำການ native password

```
mysql> ALTER USER 'example_user'@'%' IDENTIFIED WITH mysql_native_password BY 'P@ssw0rd@2023';
Query OK, 0 rows affected (0.01 sec)
```

สร้าง database ชื่อ loginsystem

```
mysql> CREATE DATABASE IF NOT EXISTS `loginsystem` DEFAULT CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected, 2 warnings (0.01 sec)
```

ใช้ database loginsystem

```
mysql> USE loginsystem;
Database changed
```

ทำการ สิทธิ์ทั้งหมดให้กับผู้ใช้ example_user บนตาราง loginsystem

```
mysql> GRANT ALL ON loginsystem.* TO 'example_user'@'%';
Query OK, 0 rows affected (0.01 sec)
```

สร้าง table ชื่อ users

```
mysql> CREATE TABLE IF NOT EXISTS `users`(
    ->   `username` varchar(50) NOT NULL,
    ->   `password` varchar(500) NOT NULL,
    ->   PRIMARY KEY (`username`)
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
Query OK, 0 rows affected, 1 warning (0.02 sec)
```

ทำการ insert ข้อมูลไปใน users

```
mysql> INSERT INTO `users`(`username`, `password`) VALUES ('test', 'test');
Query OK, 1 row affected (0.01 sec)
```

ดูข้อมูลที่ insert ลงไว้

```
mysql> select * from users;
+-----+-----+
| username | password |
+-----+-----+
| test     | test      |
+-----+-----+
1 row in set (0.00 sec)
```

ทำการ สิทธิ์ทั้งหมดให้กับผู้ใช้ example_user บนตาราง loginsystem

```
mysql> FLUSH PRIVILEGES;  
Query OK, 0 rows affected (0.00 sec)
```

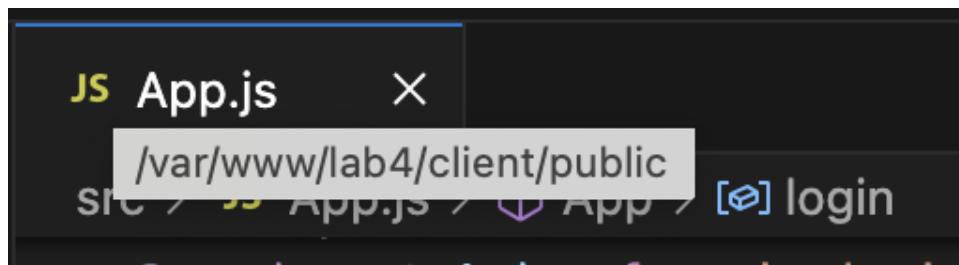
ออก mysql

```
mysql> exit  
Bye  
lertpisit@backend001:/var/www/lab4/server$
```

เปิด port 4000

```
lertpisit@backend001:/var/www/lab4/server$ sudo ufw allow 4000  
Rule added  
Rule added (v6)
```

ไปที่ vscode app.js ที่เครื่อง client

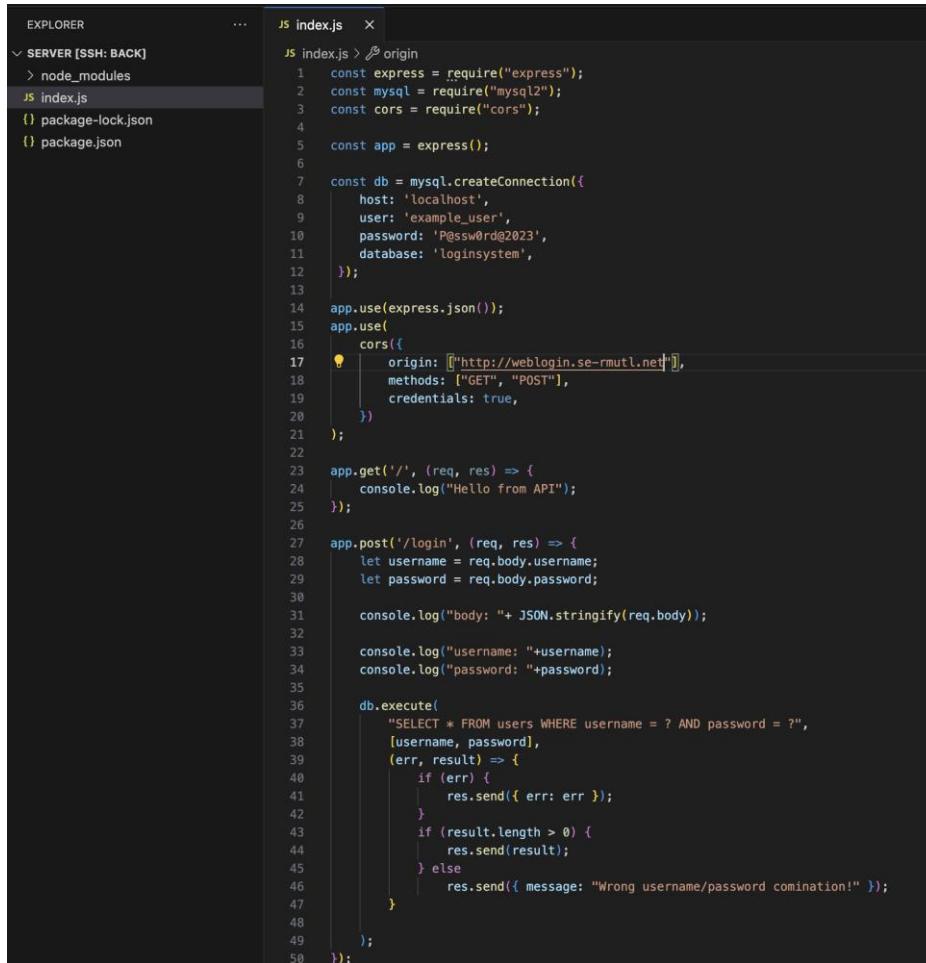


ทำการเปลี่ยน port และ ip เป็น 10.211.55.4:4000 ทั้ง 2 ที่

```
15  const register = () => {  
16    Axios.post("http://10.211.55.4:4000/register", {  
17      username: usernameReg,  
18      password: passwordReg,  
19    }).then((response) => {  
20      console.log(response);  
21  
22      if (!response.data.err) {  
23        setLoginStatus("'" +usernameReg + "' was inserted.");  
24      } else {  
25        setLoginStatus(response.data.err.sqlMessage);  
26      }  
27    });  
28  };  
29  
30  
31  
32  const login = () => {  
33    Axios.post("http://10.211.55.4:4000/login", {  
34      username: username,  
35      password: password,  
36    }).then((response) => {  
37      console.log(response);  
38    });  
39  };
```

เปิดvscode และไปที่เครื่อง backend สร้างไฟล์ index.js ที่ /var/www/lab4/server

เปลี่ยนบรรทัดที่ 17 เป็นชื่อโดเมนของเรา



```
EXPLORER ... JS index.js X
 SERVER [SSH: BACK]
 > node_modules
 js index.js
 () package-lock.json
 () package.json

JS index.js > origin
1 const express = require("express");
2 const mysql = require("mysql2");
3 const cors = require("cors");
4
5 const app = express();
6
7 const db = mysql.createConnection({
8   host: 'localhost',
9   user: 'example_user',
10  password: '@ssw0rd@2023',
11  database: 'loginsystem',
12 });
13
14 app.use(express.json());
15 app.use(
16   cors({
17     origin: ["http://weblogin.se-rmutl.net"], // Line 17
18     methods: ["GET", "POST"],
19     credentials: true,
20   })
21 );
22
23 app.get('/', (req, res) => {
24   console.log("Hello from API");
25 });
26
27 app.post('/login', (req, res) => {
28   let username = req.body.username;
29   let password = req.body.password;
30
31   console.log("body: "+ JSON.stringify(req.body));
32
33   console.log("username: "+username);
34   console.log("password: "+password);
35
36   db.execute(
37     "SELECT * FROM users WHERE username = ? AND password = ?",
38     [username, password],
39     (err, result) => {
40       if (err) {
41         res.send({ err: err });
42       }
43       if (result.length > 0) {
44         res.send(result);
45       } else {
46         res.send({ message: "Wrong username/password combination!" });
47       }
48     }
49   );
50 });


```

```

52 app.post('/register', (req, res) => {
53   let username = req.body.username;
54   let password = req.body.password;
55
56   console.log("body: "+ JSON.stringify(req.body));
57
58   console.log("username: "+username);
59   console.log("password: "+password);
60
61   db.execute(
62     "INSERT INTO users (username, password) VALUES (?,?)",
63     [username, password],
64     (err, result) => {
65       if (err) {
66         res.send({ err: err });
67       }
68       res.send(result);
69     }
70   );
71 });
72
73
74 app.listen(4000, () => {
75   console.log("running server");
76 });

```

ทำการ เปิด client ด้วย npm start

```

Compiled successfully!

You can now view client in the browser.

Local:          http://localhost:3004
On Your Network: http://10.211.55.3:3004

Note that the development build is not optimized.
To create a production build, use npm run build.

webpack compiled successfully

```

ทำการ เปิด server ด้วย nodemon index.js

```

lertpisit@backend001:/var/www/lab4/server$ nodemon index.js
[nodemon] 3.0.2
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): ***!
[nodemon] watching extensions: js,mjs,cjs,json
[nodemon] starting `node index.js`
running server

```

ลองเข้าไปทดลองใช้ระบบ

A screenshot of a web browser window titled "React App". The address bar shows "Not Secure weblogin.se-rrmutil.net". The page contains two forms: a "Registration" form and a "Login" form. The "Registration" form has fields for "Username" and "password", and a "Register" button. The "Login" form has fields for "Username..." and "Password...", and a "Login" button.

A screenshot of a web browser window titled "React App". The address bar shows "Not Secure weblogin.se-rrmutil.net". The page contains two forms: a "Registration" form and a "Login" form. The "Registration" form has fields for "Username" (lertpisit) and "password" (1234), and a "Register" button. The "Login" form has fields for "Username..." and "Password...", and a "Login" button. Below the forms, a message reads "'lertpisit' was inserted."

A screenshot of a web browser window titled "React App". The address bar shows "Not Secure weblogin.se-rrmutil.net". The page contains two forms: a "Registration" form and a "Login" form. The "Registration" form has fields for "Username" (lertpisit) and "password" (1234), and a "Register" button. The "Login" form has fields for "Username..." and "Password...", and a "Login" button. Below the forms, a message reads "'lertpisit' was logged in."