

linux

sudo -i

```
devuser@server:~$ sudo -i  
[sudo] password for devuser:
```

adduser inax

usermod -aG sudo inax

```
root@server:~# adduser inax  
Adding user `inax' ...  
Adding new group `inax' (1001) ...  
Adding new user `inax' (1001) with group `inax' ...  
Creating home directory `/home/inax' ...  
Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for inax  
Enter the new value, or press ENTER for the default  
  Full Name []: nunthiphat  
  Room Number []: 99  
  Work Phone []: 0991260098  
  Home Phone []: 0991260098  
  Other []: none
```

```
root@server:~# usermod -aG sudo inax
```

ssh inax@10.211.55.7

```
devuser@server:~$ ssh inax@10.211.55.7
inax@10.211.55.7's password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-89-generic aarch64)

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

System information as of Fri Dec  1 07:09:31 AM UTC 2023

System load:          0.001953125
Usage of /:           24.6% of 29.82GB
Memory usage:         18%
Swap usage:           0%
Processes:            124
Users logged in:      1
IPv4 address for enp0s5: 10.211.55.7
IPv6 address for enp0s5: fdb2:2c26:f4e4:0:21c:42ff:fe0e:eb3d

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

2 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

inax@server:~$ █
```

ufw allow OpenSSH

ufw enable

(ufw status)

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

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

inax@server:~$
```

(Check Apache2 : http:// < your ip >)



Ubuntu

Apache2 Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in [/usr/share/doc/apache2/README.Debian.gz](#)**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|   |-- ports.conf
|-- mods-enabled
|   |-- *.load
|   |-- *.conf
|-- conf-enabled
|   |-- *.conf
|-- sites-enabled
|   |-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- `ports.conf` is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the `mods-enabled/`, `conf-enabled/` and `sites-enabled/` directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective `*-available/` counterparts. These should be managed by using our helpers `a2enmod`, `a2dismod`, `a2ensite`, `a2dissite`, and `a2enconf`, `a2disconf`. See their respective man pages for detailed information.
- The binary is called `apache2` and is managed using `systemd`, so to start/stop the service use `systemctl start apache2` and `systemctl stop apache2`, and use `systemctl status apache2` and `journalctl -u apache2` to check status. `system` and `apache2ctl` can also be used for service management if desired. **Calling `/usr/bin/apache2` directly will not work** with the default configuration.

Document Roots

By default, Ubuntu does not allow access through the web browser to *any* file outside of those located in `/var/www`, **public_html** directories (when enabled) and `/usr/share` (for web applications). If your site is using a web document root located elsewhere (such as in `/srv`) you may need to whitelist your document root directory in

sudo apt install mysql-server

```
devuser@server:~$ sudo apt install mysql-server
[sudo] password for devuser:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
mysql-server is already the newest version (8.0.35-0ubuntu0.22.04.1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

sudo mysql -u root -p

```
devuser@server:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 37
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> █
```

sudo mysql_secure_installation

```
devuser@server:~$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Enter password for user root:
The 'validate_password' component is installed on the server.
The subsequent steps will run with the existing configuration
of the component.
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) :

... 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.

All done!
devuser@server:~$
```

```
sudo apt install php libapache2-mod-php php-mysql
```

(php -v)

```
devuser@server:~$ sudo apt install php libapache2-mod-php php-mysql
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
libapache2-mod-php is already the newest version (2:8.1+92ubuntu1).
php is already the newest version (2:8.1+92ubuntu1).
php-mysql is already the newest version (2:8.1+92ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
devuser@server:~$ php -v
PHP 8.1.2-1ubuntu2.14 (cli) (built: Aug 18 2023 11:41:11) (NTS)
Copyright (c) The PHP Group
Zend Engine v4.1.2, Copyright (c) Zend Technologies
    with Zend OPcache v8.1.2-1ubuntu2.14, Copyright (c), by Zend Technologies
devuser@server:~$
```

```
cd /var/www/
```

```
sudo mkdir Lab2
```

```
sudo chown -R $USER:$USER Lab2
```

```
sudo nano info.php
```

(more info.php)

```
devuser@server:~$ cd /var/www/
devuser@server:/var/www$ sudo mkdir Lab2
devuser@server:/var/www$ sudo chown -R $USER:$USER Lab2
devuser@server:/var/www$ sudo nano info.php
devuser@server:/var/www$ more info.php
<?php
phpinfo();
devuser@server:/var/www$
```

```
sudo nano /etc/apache2/sites-available/your_domain.conf
```

```
devuser@server:/var/www$ sudo nano /etc/apache2/sites-available/Lab2.conf
devuser@server:/var/www$
```



```
<VirtualHost *:80>
    ServerName Lab2
    ServerAlias www.Lab2.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/Lab2
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```



```
GNU nano 6.2 /etc/apache2/sites-
<VirtualHost *:80>
    ServerName Lab2
    ServerAlias www.Lab2.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/Lab2
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

sudo a2ensite lab2


sudo nano /etc/apache2/sites-available/000-default.conf (don't edit)

sudo a2dissite 000-default

sudo apache2ctl configtest

systemctl reload apache2

nano /var/www/lab2/index.html

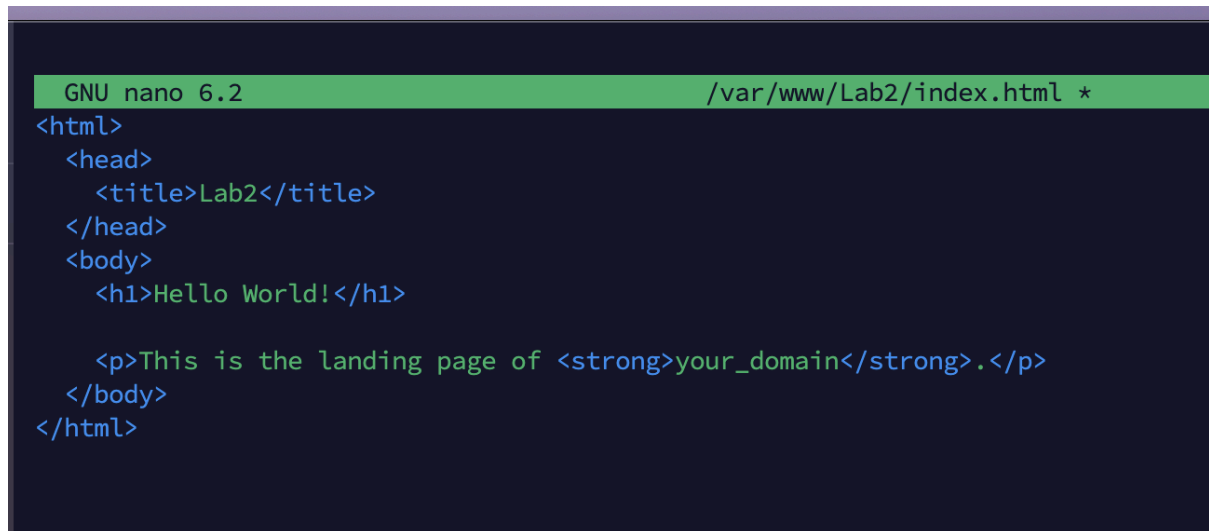


```
devuser@server:~$ nano /var/www/Lab2/index.html
devuser@server:~$
```



```
<html>
<head>
  <title>your_domain website</title>
</head>
<body>
  <h1>Hello World!</h1>

  <p>This is the landing page of <strong>your_domain</strong>.</p>
</body>
</html>
```



```
GNU nano 6.2 /var/www/Lab2/index.html *
<html>
<head>
  <title>Lab2</title>
</head>
<body>
  <h1>Hello World!</h1>

  <p>This is the landing page of <strong>your_domain</strong>.</p>
</body>
</html>
```

sudo nano /etc/apache2/mods-enabled/dir.conf



```
devuser@server:~$ sudo nano /etc/apache2/mods-enabled/dir.conf

GNU nano 6.2 /etc/apache2/mods-enabled/dir.conf
<IfModule mod_dir.c>
    DirectoryIndex index.php index.html index.cgi index.pl index.xhtml index.htm
</IfModule>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
```

```
sudo mysql -u root -p
```

```
devuser@server:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 43
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> 
```

```
(SHOW DATABASES;)
```

```
mysql> SHOW DATABASES;
+-----+
| Database |
+-----+
| information_schema |
| lab2 |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)
```

```
INSERT INTO example_database.todo_list (content) VALUES ("My 1 important item");
```

```
INSERT INTO example_database.todo_list (content) VALUES ("My 2 important item");
```

```
INSERT INTO example_database.todo_list (content) VALUES ("My 3 important item");
```

```
SELECT * FROM lab2.todo_list;
```

```
mysql> INSERT INTO lab2.todo_list (content) VALUES ("My 1 important item");  
Query OK, 1 row affected (0.01 sec)
```

```
mysql> INSERT INTO lab2.todo_list (content) VALUES ("My 2 important item");  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO lab2.todo_list (content) VALUES ("My 3 important item");  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> SELECT * FROM lab2.todo_list;
```

```
+-----+-----+  
| item_id | content                |  
+-----+-----+  
|      1 | My 1 important item |  
|      2 | My 2 important item |  
|      3 | My 3 important item |  
+-----+-----+
```

```
3 rows in set (0.00 sec)
```

```
mysql> 
```

```
nano /var/www/Lab2/todo_list.php
```

```
devuser@server:~$ nano /var/www/lab2/todo_list.php  
devuser@server:~$ 
```

```

<?php
$user = "user";
$password = "P@ssw0rd";
$database = "Lab2";
$table = "todo_list";

try {
    $db = new PDO("mysql:host=localhost;dbname=$database", $user, $password);
    echo "<h2>TODO</h2><ol>";
    foreach($db->query("SELECT content FROM $table") as $row) {
        echo "<li>" . $row['content'] . "</li>";
    }
    echo "</ol>";
} catch (PDOException $e) {
    print "Error!: " . $e->getMessage() . "<br/>";
    die();
}

```

```

GNU nano 6.2 /var/www/lab2/todo_list.php *
<?php
$user = "user";
$password = "P@ssw0rd";
$database = "lab2";
$table = "todo_list";

try {
    $db = new PDO("mysql:host=localhost;dbname=$database", $user, $password);
    echo "<h2>TODO</h2><ol>";
    foreach($db->query("SELECT content FROM $table") as $row) {
        echo "<li>" . $row['content'] . "</li>";
    }
    echo "</ol>";
} catch (PDOException $e) {
    print "Error!: " . $e->getMessage() . "<br/>";
    die();
}

```

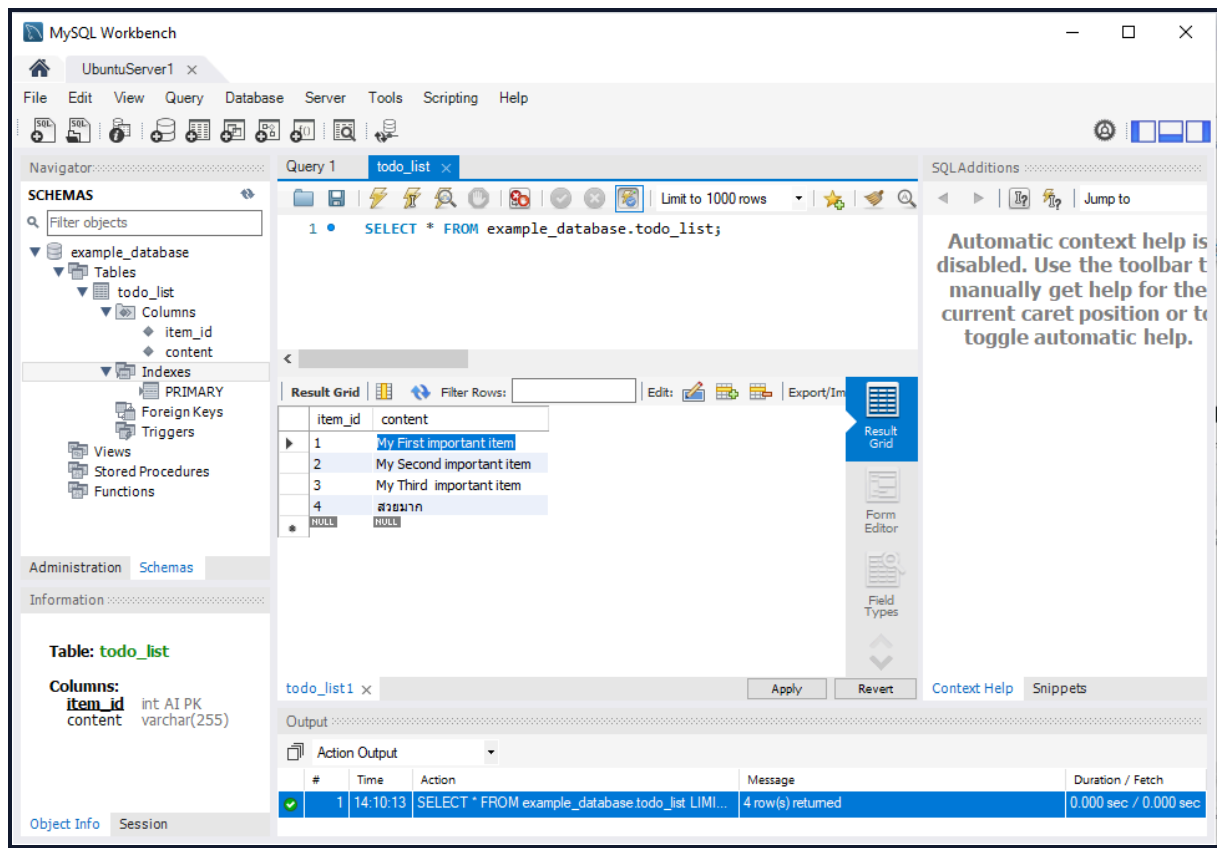
http://10.211.55.7/todo_list.php

TODO

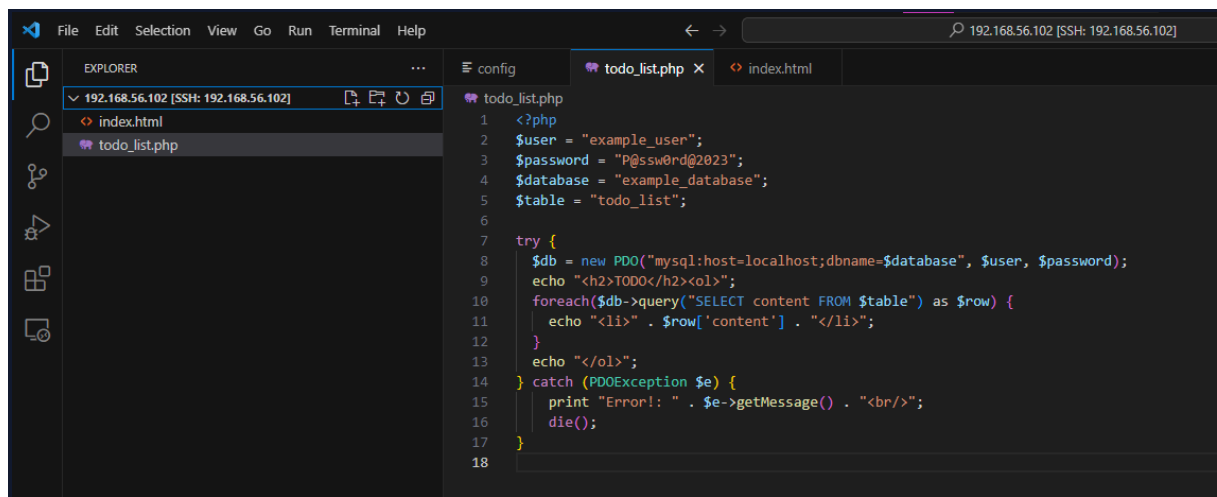
1. My 1 important item
2. My 2 important item
3. My 3 important item

STEP 8

MySQL Workbench



VSCode link SSH



Virtual Hosts

สร้าง directories lab2-1_018 และ lab2-2_018
เปลี่ยนสิทธิ์ของ directories

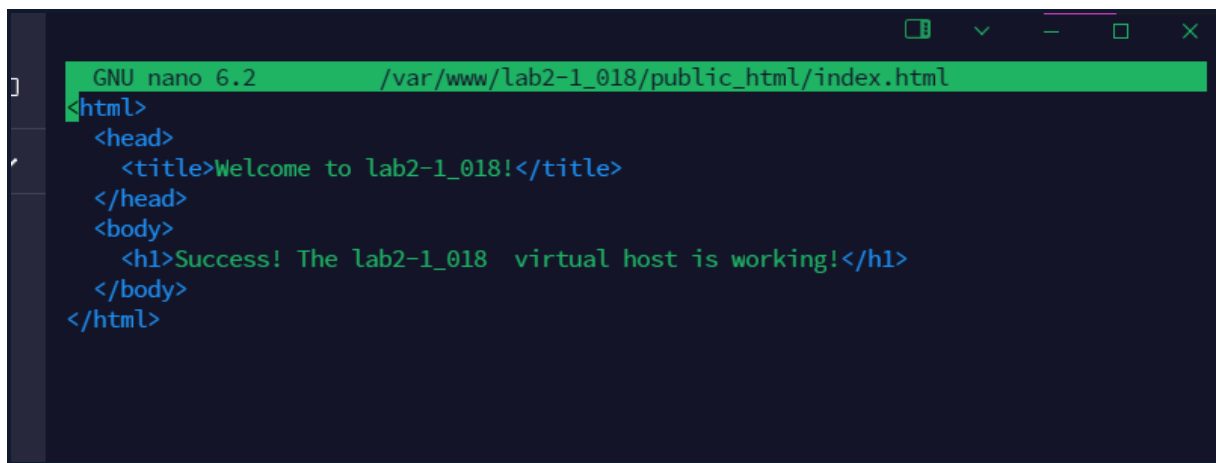
```
devuser@ubuntuserver1:~/var/www/lab2$ sudo mkdir -p /var/www/lab2-1_018/public_html
devuser@ubuntuserver1:~/var/www/lab2$ sudo mkdir -p /var/www/lab2-2_018/public_html
devuser@ubuntuserver1:~/var/www/lab2$ sudo chown -R $USER:$USER /var/www/lab2-1_018/public_html
devuser@ubuntuserver1:~/var/www/lab2$ sudo chown -R $USER:$USER /var/www/lab2-2_018/public_html
```

ให้ สิทธิ์ ของ directories

```
devuser@ubuntuserver1:~/var/www/lab2$ sudo chmod -R 755 /var/www
```

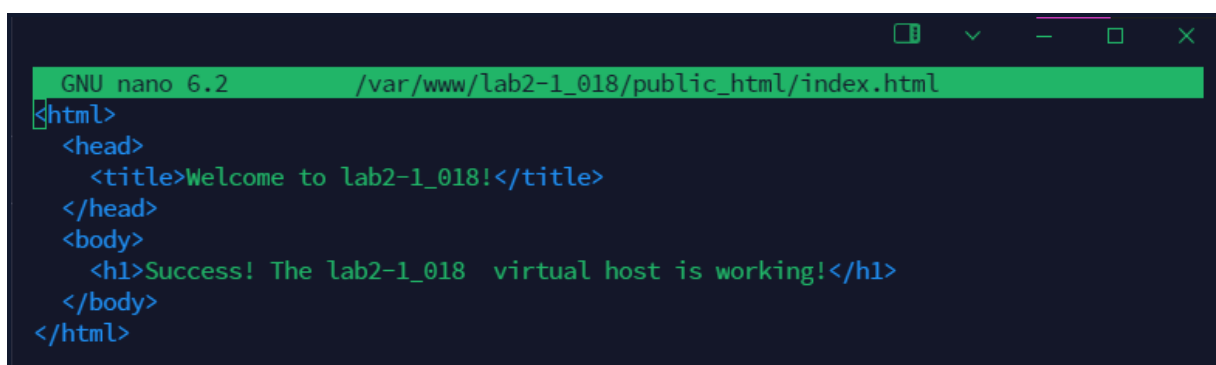
สร้าง index.html ทั้งสอง folder

```
devuser@ubuntuserver1:~/var/www/lab2$ sudo chmod -R 755 /var/www
devuser@ubuntuserver1:~/var/www/lab2$ nano /var/www/lab2-1_018/public_html/index.html
devuser@ubuntuserver1:~/var/www/lab2$ nano /var/www/lab2-2_018/public_html/index.html
```



GNU nano 6.2 /var/www/lab2-1_018/public_html/index.html

```
<html>
<head>
  <title>Welcome to lab2-1_018!</title>
</head>
<body>
  <h1>Success! The lab2-1_018 virtual host is working!</h1>
</body>
</html>
```



GNU nano 6.2 /var/www/lab2-1_018/public_html/index.html

```
<html>
<head>
  <title>Welcome to lab2-1_018!</title>
</head>
<body>
  <h1>Success! The lab2-1_018 virtual host is working!</h1>
</body>
</html>
```

Copy 000-default.conf ไป /etc/apache2/sites-available
และ เปลี่ยนชื่อเป็น lab2-1_018 และ lab2-2_018

```
devuser@ubuntuserver1:~/var/www/lab2$ sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/lab2-1_018.conf
devuser@ubuntuserver1:~/var/www/lab2$ sudo nano /etc/apache2/sites-available/lab2-1_018.conf
devuser@ubuntuserver1:~/var/www/lab2$ sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/lab2-2_018.conf
devuser@ubuntuserver1:~/var/www/lab2$ sudo nano /etc/apache2/sites-available/lab2-2_018.conf
```

```
GNU nano 6.2 /etc/apache2/sites-available/lab2-1_018.conf
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.
    #ServerName www.example.com

    ServerAdmin admin@lab2-1_018
    ServerName lab2-1_018
    ServerAlias www.lab2-1_018
    DocumentRoot /var/www/lab2-1_018/public_html

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
```



```

GNU nano 6.2 /etc/apache2/sites-available/lab2-2_018.conf
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.
    #ServerName www.example.com

    ServerAdmin admin@lab2-2_018
    ServerName lab2-2_018
    ServerAlias www.lab2-2_018
    DocumentRoot /var/www/lab2-2_018/public_html

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet

```

Enable ไฟล์ทั้งสอง

```

devuser@ubuntuserver1:~/var/www/lab2$ sudo a2ensite lab2-1_018.conf
Enabling site lab2-1_018.
To activate the new configuration, you need to run:
    systemctl reload apache2
devuser@ubuntuserver1:~/var/www/lab2$ sudo a2ensite lab2-2_018.conf
Enabling site lab2-2_018.
To activate the new configuration, you need to run:
    systemctl reload apache2

```

Test Apache

```
devuser@ubuntuserver1:~/var/www/lab2$ 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
```

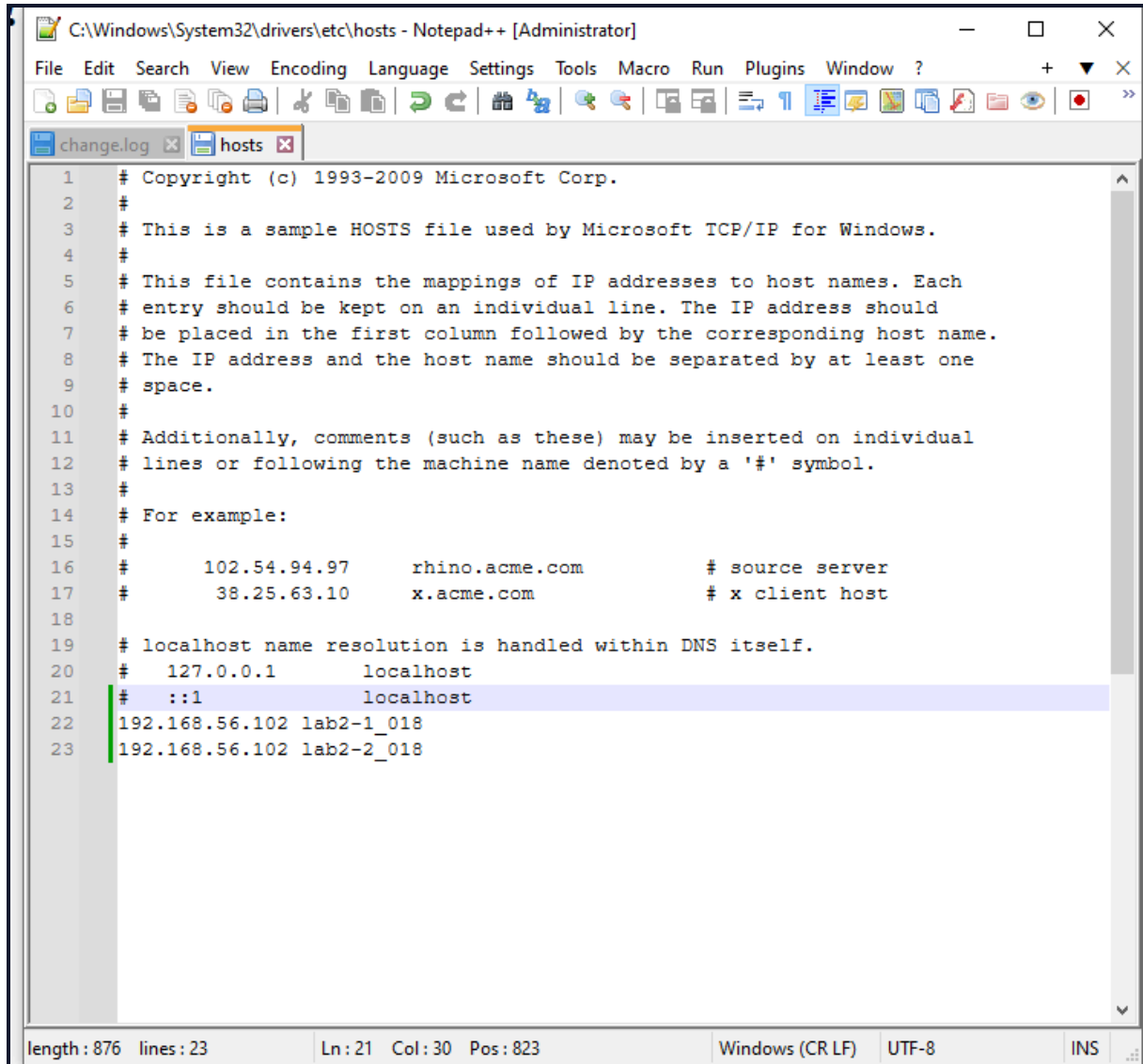
Disable ไฟล์ default

```
devuser@ubuntuserver1:~/var/www/lab2$ sudo a2dissite 000-default.conf
Site 000-default already disabled
```

Restart Apache

```
devuser@ubuntuserver1:~/var/www/lab2$ sudo systemctl restart apache2
devuser@ubuntuserver1:~/var/www/lab2$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-12-07 08:41:16 UTC; 6s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 9102 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
 Main PID: 9107 (apache2)
    Tasks: 6 (limit: 4558)
   Memory: 10.2M
      CPU: 27ms
```

แก้ไข ไฟล์ hosts ใน etc เพิ่ม

A screenshot of a Notepad++ window titled "C:\Windows\System32\drivers\etc\hosts - Notepad++ [Administrator]". The window shows the contents of the hosts file. The text is as follows:

```
1  # Copyright (c) 1993-2009 Microsoft Corp.
2  #
3  # This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
4  #
5  # This file contains the mappings of IP addresses to host names. Each
6  # entry should be kept on an individual line. The IP address should
7  # be placed in the first column followed by the corresponding host name.
8  # The IP address and the host name should be separated by at least one
9  # space.
10 #
11 # Additionally, comments (such as these) may be inserted on individual
12 # lines or following the machine name denoted by a '#' symbol.
13 #
14 # For example:
15 #
16 #      102.54.94.97      rhino.acme.com      # source server
17 #      38.25.63.10      x.acme.com          # x client host
18
19 # localhost name resolution is handled within DNS itself.
20 # 127.0.0.1      localhost
21 # ::1            localhost
22 192.168.56.102 lab2-1_018
23 192.168.56.102 lab2-2_018
```

The status bar at the bottom indicates "length : 876 lines : 23", "Ln : 21 Col : 30 Pos : 823", "Windows (CR LF)", "UTF-8", and "INS". The line containing "# ::1 localhost" is highlighted in blue.

ทดสอบ

