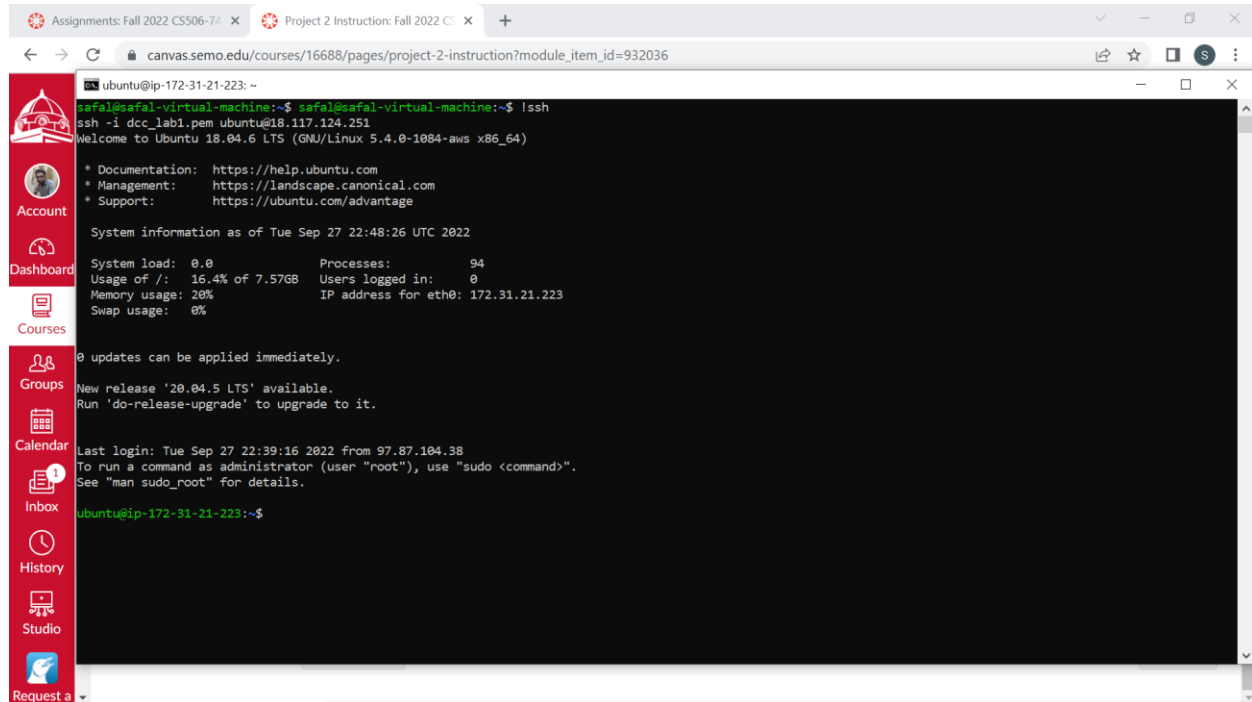


# Install a Web Server on Your EC2 Instance

# This hands-on project is based on the work from, <https://github.com/RyanFitzgerald/devportfolio>. You can find more information from this link.

## 1. Use your local ubuntu VM to ssh **your EC2 instance**.

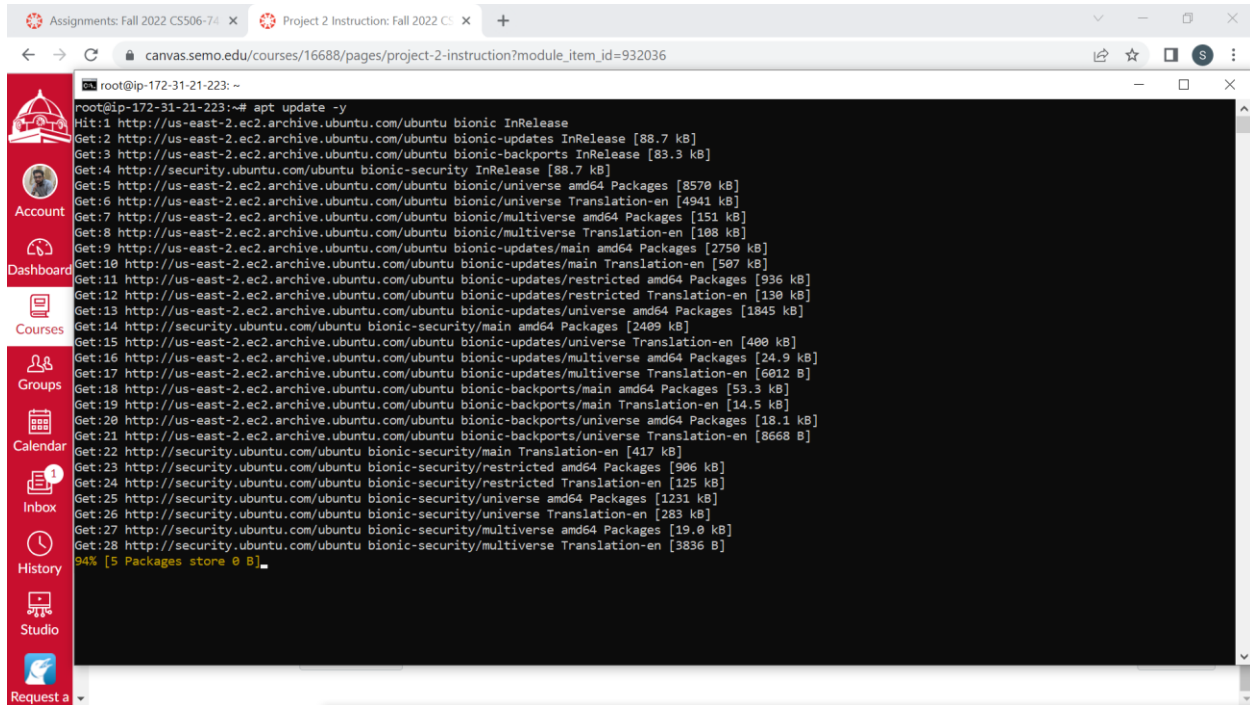


```
ubuntu@ip-172-31-21-223: ~  
safal@safal-virtual-machine:~$ safal@safal-virtual-machine:~$ !ssh  
ssh -i dcc_lab1.pem ubuntu@18.117.124.251  
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1084-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
System information as of Tue Sep 27 22:48:26 UTC 2022  
  
System load:  0.0          Processes:    94  
Usage of /:   16.4% of 7.57GB   Users logged in:  0  
Memory usage: 20%          IP address for eth0: 172.31.21.223  
Swap usage:   0%  
  
0 updates can be applied immediately.  
New release '20.04.5 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Tue Sep 27 22:39:16 2022 from 97.87.104.38  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
ubuntu@ip-172-31-21-223:~$
```

## 2. Install Apache, MySQL & PHP on your EC2 instance.

<https://hostadvice.com/how-to/how-to-install-apache-mysql-php-on-an-ubuntu-18-04-vps/>

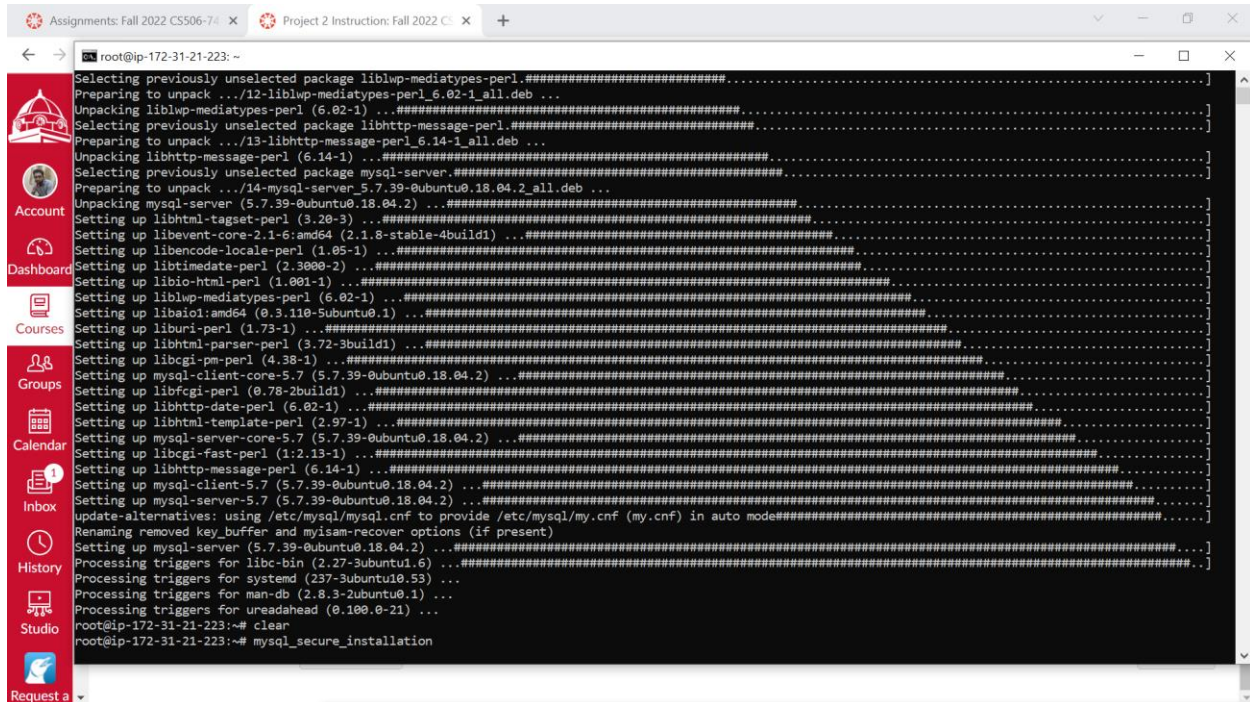
```
$ sudo apt update
```



```
root@ip-172-31-21-223: ~  
root@ip-172-31-21-223:~# apt update -y  
Hit:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic InRelease  
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]  
Get:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease [83.3 kB]  
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]  
Get:5 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 Packages [8570 kB]  
Get:6 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/universe Translation-en [4941 kB]  
Get:7 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/multiverse amd64 Packages [151 kB]  
Get:8 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en [108 kB]  
Get:9 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [2750 kB]  
Get:10 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main Translation-en [507 kB]  
Get:11 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/restricted amd64 Packages [936 kB]  
Get:12 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/restricted Translation-en [130 kB]  
Get:13 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [1845 kB]  
Get:14 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [2409 kB]  
Get:15 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/universe Translation-en [400 kB]  
Get:16 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 Packages [24.9 kB]  
Get:17 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/multiverse Translation-en [6012 B]  
Get:18 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages [53.3 kB]  
Get:19 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports/main Translation-en [14.5 kB]  
Get:20 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages [18.1 kB]  
Get:21 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en [8660 B]  
Get:22 http://security.ubuntu.com/ubuntu bionic-security/main Translation-en [417 kB]  
Get:23 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Packages [906 kB]  
Get:24 http://security.ubuntu.com/ubuntu bionic-security/restricted Translation-en [125 kB]  
Get:25 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [1231 kB]  
Get:26 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [283 kB]  
Get:27 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [19.0 kB]  
Get:28 http://security.ubuntu.com/ubuntu bionic-security/multiverse Translation-en [3836 B]  
94% [5 Packages store 0 B]
```

# install mysql server

\$ sudo apt install mysql-server

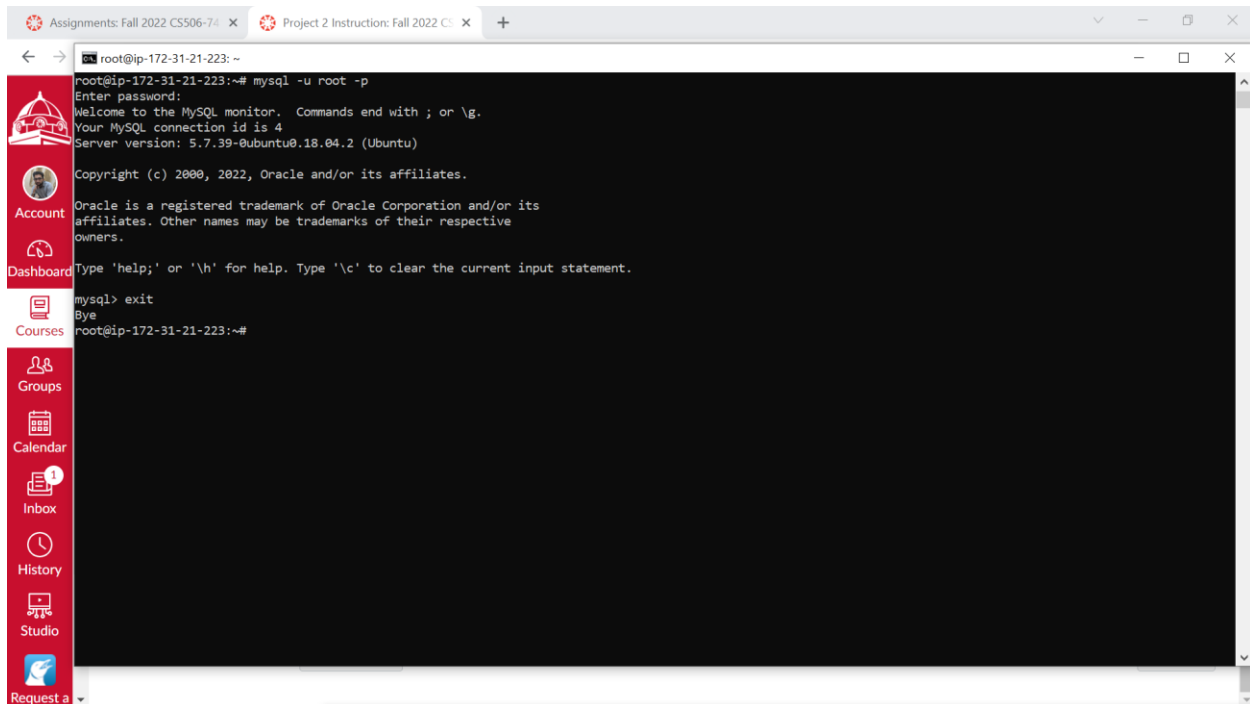


```
root@ip-172-31-21-223: ~  
root@ip-172-31-21-223:~# sudo apt install mysql-server  
Selecting previously unselected package liblwp-mediatypes-perl.#####  
Preparing to unpack .../12-liblwp-mediatypes-perl_6.02-1_all.deb ...  
Unpacking liblwp-mediatypes-perl (6.02-1) ...#####  
Selecting previously unselected package libhttp-message-perl.#####  
Preparing to unpack .../13-libhttp-message-perl_6.14-1_all.deb ...  
Unpacking libhttp-message-perl (6.14-1) ...#####  
Selecting previously unselected package mysql-server.#####  
Preparing to unpack .../14-mysql-server_5.7.39-0ubuntu0.18.04.2_all.deb ...  
Unpacking mysql-server (5.7.39-0ubuntu0.18.04.2) ...#####  
Setting up libhtml-tagset-perl (3.20-3) ...#####  
Setting up libevent-core-2.1-6:amd64 (2.1.8-stable-4build1) ...#####  
Setting up libencode-locale-perl (1.05-1) ...#####  
Setting up libtimedate-perl (2.3000-2) ...#####  
Setting up libio-html-perl (1.001-1) ...#####  
Setting up liblwp-mediatypes-perl (6.02-1) ...#####  
Setting up libaio1:amd64 (0.3.110-Subuntu0.1) ...#####  
Setting up liburi-perl (1.73-1) ...#####  
Setting up libhtml-parser-perl (3.72-3build1) ...#####  
Setting up libcgi-pm-perl (4.38-1) ...#####  
Setting up mysql-client-5.7 (5.7.39-0ubuntu0.18.04.2) ...#####  
Setting up libfcgi-perl (0.78-2build1) ...#####  
Setting up libhttp-date-perl (6.02-1) ...#####  
Setting up libhtml-template-perl (2.97-1) ...#####  
Setting up mysql-server-core-5.7 (5.7.39-0ubuntu0.18.04.2) ...#####  
Setting up libcgi-fast-perl (1.12.13-1) ...#####  
Setting up libhttp-message-perl (6.14-1) ...#####  
Setting up mysql-client-5.7 (5.7.39-0ubuntu0.18.04.2) ...#####  
Setting up mysql-server-5.7 (5.7.39-0ubuntu0.18.04.2) ...#####  
update-alternatives: using /etc/mysql/mysql.cnf to provide /etc/mysql/my.cnf (my.cnf) in auto mode#####  
Renaming removed key_buffer and myisam-recover options (if present)  
Setting up mysql-server (5.7.39-0ubuntu0.18.04.2) ...#####  
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...#####  
Processing triggers for systemd (237-3ubuntu10.53) ...  
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...  
Processing triggers for ureadahead (0.100.0-21) ...  
root@ip-172-31-21-223:~# clear  
root@ip-172-31-21-223:~# mysql_secure_installation
```

# test your mysql server, password is your EC2 instance's password

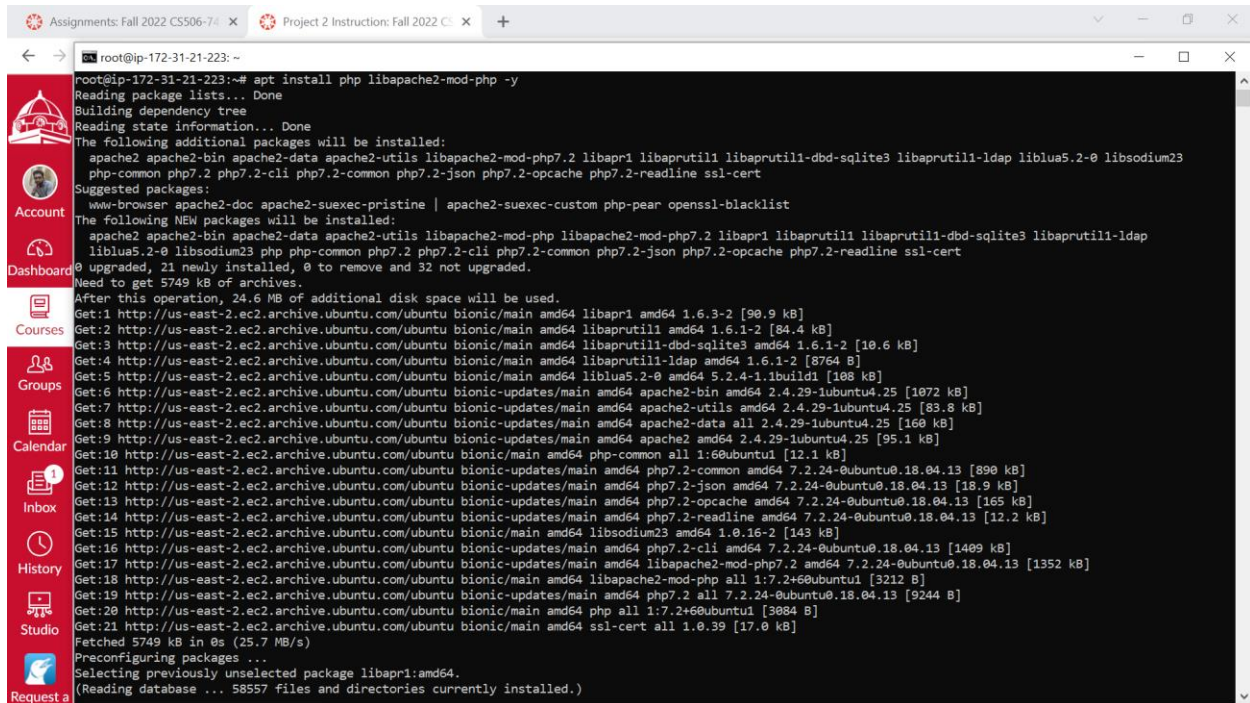
```
$ sudo mysql -u root -p
```

```
mysql> quit
```



```
root@ip-172-31-21-223: ~  
root@ip-172-31-21-223:~# mysql -u root -p  
Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 4  
Server version: 5.7.39-0ubuntu0.18.04.2 (Ubuntu)  
  
Copyright (c) 2000, 2022, Oracle and/or its affiliates.  
  
Oracle is a registered trademark of Oracle Corporation and/or its  
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> exit  
Bye  
root@ip-172-31-21-223:~#
```

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



```
root@ip-172-31-21-223: ~  
root@ip-172-31-21-223:~# apt install php libapache2-mod-php -y  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  apache2 apache2-bin apache2-data apache2-utils libapache2-mod-php7.2 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0 libsodium23  
  php-common php7.2 php7.2-cli php7.2-common php7.2-json php7.2-opcache php7.2-readline ssl-cert  
Suggested packages:  
  www-browser apache2-doc apache2-suexec-pristine | apache2-suexec-custom php-pear openssl-blacklist  
The following NEW packages will be installed:  
  apache2 apache2-bin apache2-data apache2-utils libapache2-mod-php libapache2-mod-php7.2 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap  
  liblua5.2-0 libsodium23 php php-common php7.2 php7.2-cli php7.2-common php7.2-json php7.2-opcache php7.2-readline ssl-cert  
0 upgraded, 21 newly installed, 0 to remove and 32 not upgraded.  
Need to get 5749 kB of archives.  
After this operation, 24.6 MB of additional disk space will be used.  
Get:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 libapr1 amd64 1.6.3-2 [90.9 kB]  
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 libaprutil1 amd64 1.6.1-2 [84.4 kB]  
Get:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-2 [10.6 kB]  
Get:4 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 libaprutil1-ldap amd64 1.6.1-2 [8764 B]  
Get:5 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 liblua5.2-0 amd64 5.2.4-1.1build1 [108 kB]  
Get:6 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2-bin amd64 2.4.29-1ubuntu4.25 [1072 kB]  
Get:7 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2-utils amd64 2.4.29-1ubuntu4.25 [83.8 kB]  
Get:8 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2-data all 2.4.29-1ubuntu4.25 [160 kB]  
Get:9 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2 amd64 2.4.29-1ubuntu4.25 [95.1 kB]  
Get:10 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 php-common all 1:60ubuntu1 [12.1 kB]  
Get:11 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 php7.2-common amd64 7.2.24-0ubuntu0.18.04.13 [890 kB]  
Get:12 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 php7.2-json amd64 7.2.24-0ubuntu0.18.04.13 [18.9 kB]  
Get:13 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 php7.2-opcache amd64 7.2.24-0ubuntu0.18.04.13 [165 kB]  
Get:14 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 php7.2-readline amd64 7.2.24-0ubuntu0.18.04.13 [12.2 kB]  
Get:15 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 libsodium23 amd64 1.0.16-2 [143 kB]  
Get:16 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 php7.2-cli amd64 7.2.24-0ubuntu0.18.04.13 [1409 kB]  
Get:17 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libapache2-mod-php7.2 amd64 7.2.24-0ubuntu0.18.04.13 [1352 kB]  
Get:18 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 libapache2-mod-php all 1:7.2+60ubuntu1 [3212 B]  
Get:19 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 php7.2 all 7.2.24-0ubuntu0.18.04.13 [9244 B]  
Get:20 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 php all 1:7.2+60ubuntu1 [3084 B]  
Get:21 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 ssl-cert all 1.0.39 [17.0 kB]  
Fetched 5749 kB in 0s (25.7 MB/s)  
Preconfiguring packages ...  
Selecting previously unselected package libapr1:amd64.  
(Reading database ... 58557 files and directories currently installed.)
```

```
root@ip-172-31-21-223:~# systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Drop-In: /lib/systemd/system/apache2.service.d
            └─apache2-systemd.conf
   Active: active (running) since Tue 2022-09-27 22:55:21 UTC; 52s ago
     Main PID: 21790 (apache2)
        Tasks: 6 (limit: 1134)
      CGroup: /system.slice/apache2.service
              └─21790 /usr/sbin/apache2 -k start
                 21796 /usr/sbin/apache2 -k start
                 21797 /usr/sbin/apache2 -k start
                 21798 /usr/sbin/apache2 -k start
                 21799 /usr/sbin/apache2 -k start
                 21800 /usr/sbin/apache2 -k start

Sep 27 22:55:21 ip-172-31-21-223 systemd[1]: Stopped The Apache HTTP Server.
Sep 27 22:55:21 ip-172-31-21-223 systemd[1]: Starting The Apache HTTP Server...
Sep 27 22:55:21 ip-172-31-21-223 systemd[1]: Started The Apache HTTP Server.

root@ip-172-31-21-223:~# netstat -anlpt | grep LIST
tcp        0      0 0.0.0.0:3306        0.0.0.0:*           LISTEN      3408/mysql
tcp        0      0 0.0.0.0:53:53      0.0.0.0:*           LISTEN      679/systemd-resolve
tcp        0      0 0.0.0.0:22        0.0.0.0:*           LISTEN      949/sshd
tcp6       0      0 :::80             :::*                LISTEN      21790/apache2
tcp6       0      0 :::22             :::*                LISTEN      949/sshd
```

```
$ sudo nano /var/www/html/info.php
```

```
<?php
```

```
phpinfo();
```

```
?>
```

```
# Save file
```

```
CTRL+o
```

```
# Exit nano
```

```
CTRL+x
```

The screenshot shows a terminal window with a red sidebar on the left containing icons for Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, and Request a. The terminal output is as follows:

```
root@ip-172-31-21-223: ~  
root@ip-172-31-21-223:~# vi /var/www/html/info.php  
root@ip-172-31-21-223:~# cat /var/www/html/info.php  
<?php  
phpinfo();  
?>  
root@ip-172-31-21-223:~#
```

\$ sudo systemctl restart apache2

The screenshot shows the same terminal window after running the command to restart the apache2 service. The output is as follows:

```
root@ip-172-31-21-223:~# systemctl restart apache2  
root@ip-172-31-21-223:~# systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)  
   Drop-In: /lib/systemd/system/apache2.service.d  
            └─apache2-systemd.conf  
   Active: active (running) since Tue 2022-09-27 22:58:42 UTC; 5s ago  
     Process: 22462 ExecStop=/usr/sbin/apachectl stop (code=exited, status=0/SUCCESS)  
     Process: 22468 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)  
    Main PID: 22484 (apache2)  
       Tasks: 6 (limit: 1134)  
     CGroup: /system.slice/apache2.service  
             └─22484 /usr/sbin/apache2 -k start  
               └─22489 /usr/sbin/apache2 -k start  
                 └─22490 /usr/sbin/apache2 -k start  
                   └─22491 /usr/sbin/apache2 -k start  
                     └─22492 /usr/sbin/apache2 -k start  
                       └─22493 /usr/sbin/apache2 -k start  
Sep 27 22:58:42 ip-172-31-21-223 systemd[1]: Starting The Apache HTTP Server...  
Sep 27 22:58:42 ip-172-31-21-223 systemd[1]: Started The Apache HTTP Server.  
root@ip-172-31-21-223:~#
```

### 3. Set file permissions for the Apache web server

[https://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/CHAP\\_Tutorials.WebServerDB.CreateWebServer.html](https://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/CHAP_Tutorials.WebServerDB.CreateWebServer.html) (Links to an external site.)

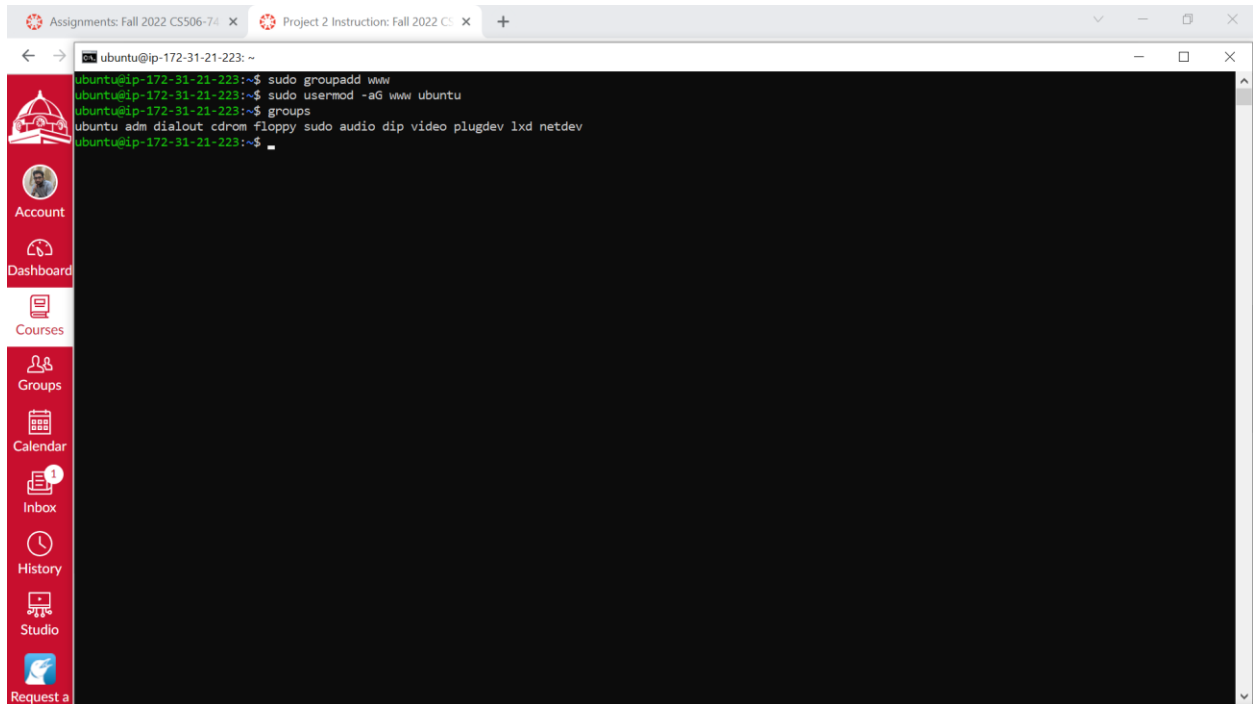


# Add a new group www

\$ sudo groupadd www

# Add the ec2-user "ubuntu" to the "www" group.

\$ sudo usermod -a -G www Ubuntu

A screenshot of a terminal window with a red sidebar on the left containing icons for Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, and Request a. The terminal shows the following commands and output:

```
ubuntu@ip-172-31-21-223: ~  
ubuntu@ip-172-31-21-223:~$ sudo groupadd www  
ubuntu@ip-172-31-21-223:~$ sudo usermod -aG www ubuntu  
ubuntu@ip-172-31-21-223:~$ groups  
ubuntu adm dialout cdrom floppy sudo audio dip video plugdev lxd netdev  
ubuntu@ip-172-31-21-223:~$
```

# Log out to refresh your permissions and include the new `apache` group.

\$ exit

# ssh your EC2 instance again.

# Log back in again and verify that the `apache` group exists with the `groups` command.

\$ groups

# Change the group ownership of the `/var/www` directory and its contents to the `apache` group.

\$ sudo chgrp -R www /var/www

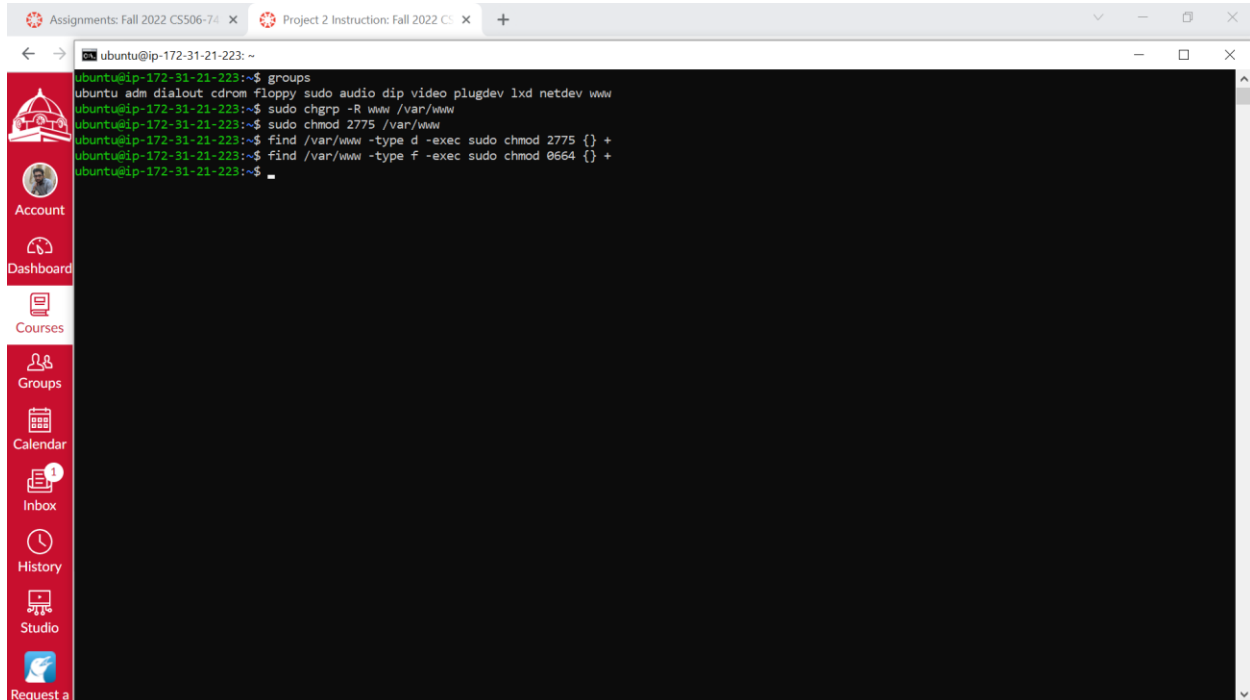
# Change the directory permissions of `/var/www` and its subdirectories to add group write permissions and set the group ID on subdirectories created in the future.

\$ sudo chmod 2775 /var/www

\$ find /var/www -type d -exec sudo chmod 2775 {} +

# Recursively change the permissions for files in the `/var/www` directory and its subdirectories to add group write permissions

\$ `find /var/www -type f -exec sudo chmod 0664 {} +`



The screenshot shows a terminal window with a red sidebar on the left containing icons for Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, and Request a. The terminal output is as follows:

```
ubuntu@ip-172-31-21-223:~$ groups
ubuntu adm dialout cdrom floppy sudo audio dip video plugdev lxd netdev www
ubuntu@ip-172-31-21-223:~$ sudo chgrp -R www /var/www
ubuntu@ip-172-31-21-223:~$ sudo chmod 2775 /var/www
ubuntu@ip-172-31-21-223:~$ find /var/www -type d -exec sudo chmod 2775 {} +
ubuntu@ip-172-31-21-223:~$ find /var/www -type f -exec sudo chmod 0664 {} +
ubuntu@ip-172-31-21-223:~$
```

# Now, `ec2-user` "ubuntu" (and any future members of the `apache` group) can add, delete, and edit files in the Apache document root, enabling you to add content, such as a static website or a PHP application.

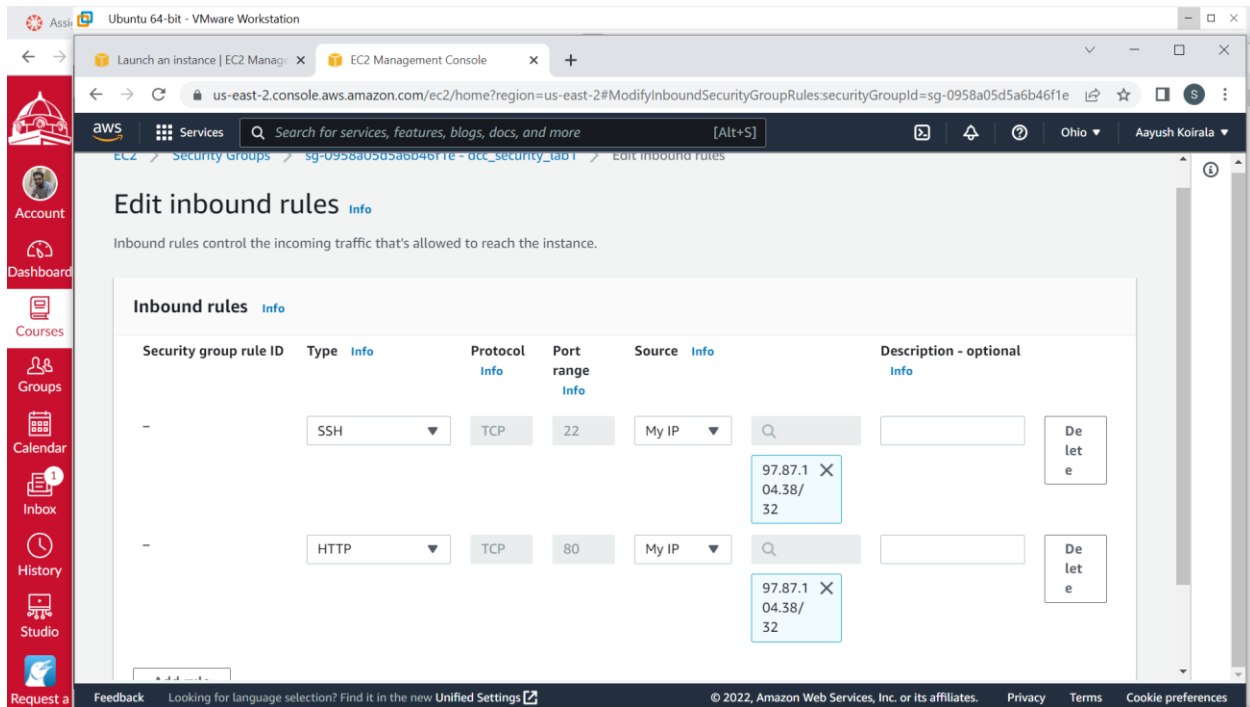
#### 4. Edit inbound rules of your EC2 instance.

# Add a new rule to enabling Port 80 for the HTTP traffic on your EC2 instance.

Your AWS console -> Network & Security -> Security Groups -> -> Inbound rules -> Edit inbound rules -> Add rule -> Type -> HTTP -> Source type -> My IP -> Save rules

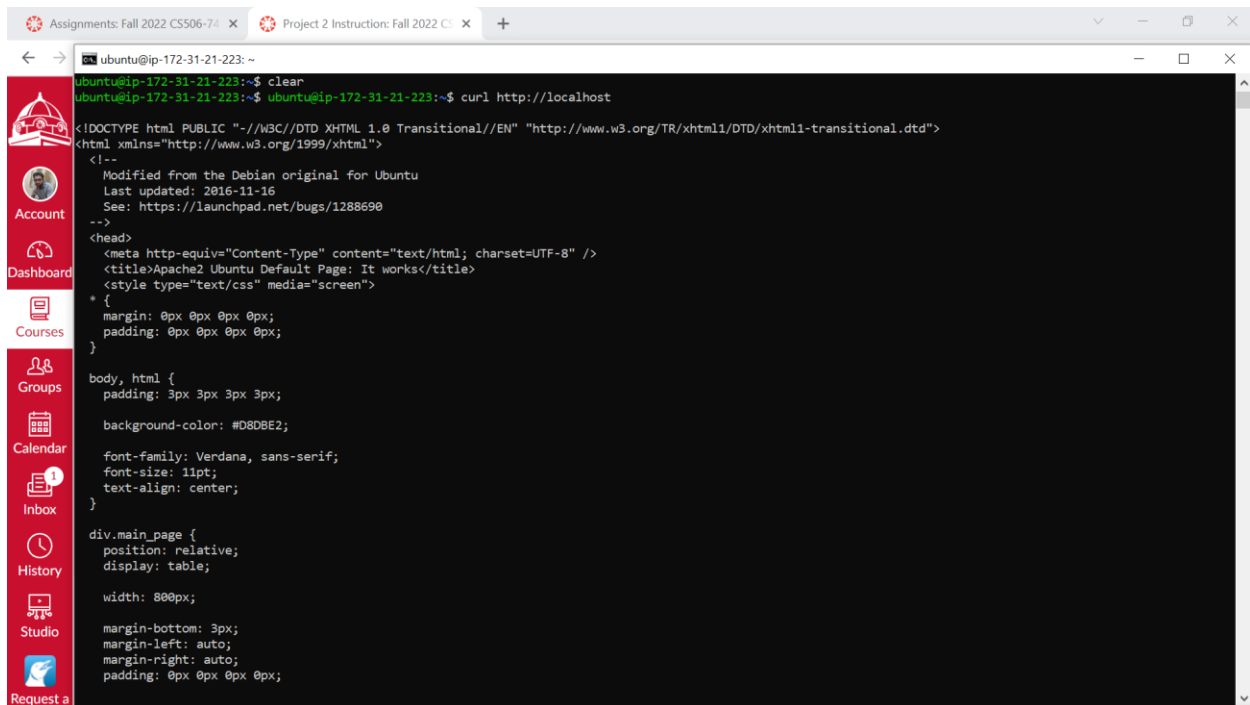
\* If you can not ssh to your EC2 instance, you may need to create a new rule for your ssh traffic

Your AWS console -> Network & Security -> Security Groups -> -> Inbound rules -> Edit inbound rules -> Add rule -> Type -> SSH -> Source type -> My IP -> Save rules



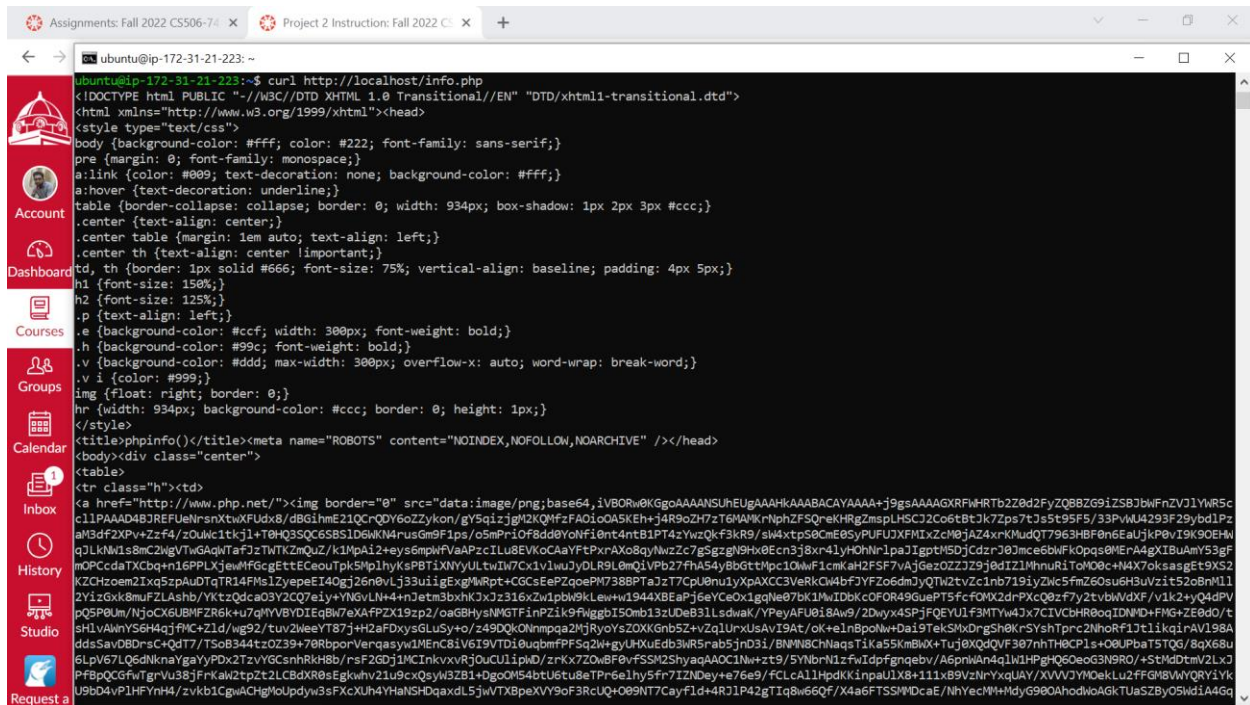
## 5. Test your Apache Web server and PHP Server on **your EC2 Instance**.

curl <http://localhost>



curl <http://localhost/info.php>





The screenshot shows a web browser window with a sidebar on the left containing navigation links: Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, and Request a. The main content area displays a terminal window with the following code:

```
ubuntu@ip-172-31-21-223:~$ curl http://localhost/info.php
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"><head>
<style type="text/css">
body {background-color: #fff; color: #222; font-family: sans-serif;}
pre {margin: 0; font-family: monospace;}
a:link {color: #009; text-decoration: none; background-color: #fff;}
a:hover {text-decoration: underline;}
table {border-collapse: collapse; border: 0; width: 934px; box-shadow: 1px 2px 3px #ccc;}
.center {text-align: center;}
.center table {margin: 1em auto; text-align: left;}
.center th {text-align: center !important;}
td, th {border: 1px solid #666; font-size: 75%; vertical-align: baseline; padding: 4px 5px;}
h1 {font-size: 150%;}
h2 {font-size: 125%;}
.p {text-align: left;}
.e {background-color: #ccf; width: 300px; font-weight: bold;}
.h {background-color: #99c; font-weight: bold;}
.v {background-color: #ddd; max-width: 300px; overflow-x: auto; word-wrap: break-word;}
.v i {color: #999;}
img {float: right; border: 0;}
hr {width: 934px; background-color: #ccc; border: 0; height: 1px;}
</style>
<title>phpinfo()</title><meta name="ROBOTS" content="NOINDEX,NOFOLLOW,NOARCHIVE" /></head>
<body><div class="center">
<table>
<tr class="h"><td>
<a href="http://www.php.net/">
<html xmlns="http://www.w3.org/1999/xhtml">
<!--
  Modified from the Debian original for Ubuntu
  Last updated: 2016-11-16
  See: https://launchpad.net/bugs/1288690
-->
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
  <title>Apache2 Ubuntu Default Page: It works</title>
  <style type="text/css" media="screen">
    * {
      margin: 0px 0px 0px 0px;
      padding: 0px 0px 0px 0px;
    }

    body, html {
      padding: 3px 3px 3px 3px;

      background-color: #D8DBE2;

      font-family: Verdana, sans-serif;
      font-size: 11pt;
      text-align: center;
    }

    div.main_page {
      position: relative;
      display: table;

      width: 800px;

      margin-bottom: 3px;
      margin-left: auto;
      margin-right: auto;
      padding: 0px 0px 0px 0px;

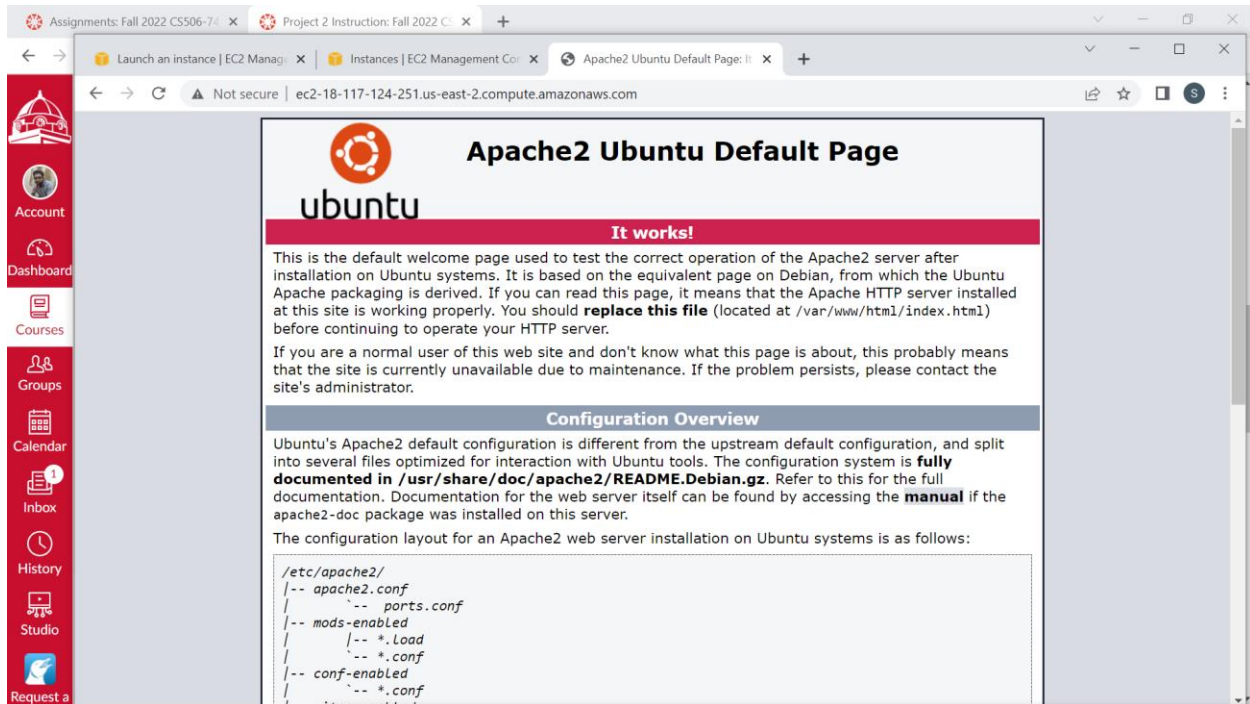
      border-width: 2px;
```

curl <http://ec2-18-216-155-172.us-east-2.compute.amazonaws.com/info.php> (Links to an external site.)

```
Assignments: Fall 2022 CS506-74 x Project 2 Instruction: Fall 2022 C: x +
safal@safal-virtual-machine: ~$ curl http://ec2-18-117-124-251.us-east-2.compute.amazonaws.com/info.php
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"><head>
<style type="text/css">
body {background-color: #fff; color: #222; font-family: sans-serif;}
pre {margin: 0; font-family: monospace;}
a:link {color: #009; text-decoration: none; background-color: #fff;}
a:hover {text-decoration: underline;}
table {border-collapse: collapse; border: 0; width: 934px; box-shadow: 1px 2px 3px #ccc;}
.center {text-align: center;}
.center table {margin: 1em auto; text-align: left;}
.center th {text-align: center !important;}
td, th {border: 1px solid #666; font-size: 75%; vertical-align: baseline; padding: 4px 5px;}
h1 {font-size: 150%;}
h2 {font-size: 125%;}
.p {text-align: left;}
.e {background-color: #ccf; width: 300px; font-weight: bold;}
.h {background-color: #99c; font-weight: bold;}
.v {background-color: #ddd; max-width: 300px; overflow-x: auto; word-wrap: break-word;}
.v i {color: #999;}
img {float: right; border: 0;}
hr {width: 934px; background-color: #ccc; border: 0; height: 1px;}
</style>
<title>phpinfo()</title><meta name="ROBOTS" content="NOINDEX,NOFOLLOW,NOARCHIVE" /></head>
<body><div class="center">
<table>
<tr class="h"><td>
<a href="http://www.php.net/"><img border="0" src="data:image/png;base64,iVBORw0KGgoAAAANSUHuEgAAAHKAAABACAYAAAAA+j9gsAAAAGRFbWRTb2Z0d2FyZQB8ZG91ZSBjbWFnZVJ1YWR5c2lPAAD4B3REFUeNrsNxtwFUDx8/dBGihmE21QCRQDY6oZykon/gY5qizjgM2KQfzFA0i0A5Eh+j4R9oZHzT6MAWkrNphZF5QneKHrgZmsplHSCJ2Co6tBtJk7Zps7t35t95F5/33PvWMU4293F29ybd1Pz
aH3dF2XPv+ZzF4/z0Wc1tkj1+T0HQ3SQ6SBS1D6WKN4rusGm9F1ps/o5mPriOF8dd8YoNf10nt4ntB1PT4zYwZkf3kR9/sW4xtpS0CmE0SyPUFUJXFMIxZcM0jAZ4xrKudQT7963HBF0n6EaUjkP0vI9K90EHw
q3LKmN1s8mC2HwTGAQWtafJzTWTkMzQuZ/k1MpaI2+eys6mpwFvaAPzcILu8EVkoCAayFtPPrXo8qyNwzC7c5gZgN9Hw8Ec3j8xr4lyH0hNr1paJlgtM5DjCdZrJ0Jmce6BwFkOpqs0MERa4gXIBuAmY53gF
m0PCcdaTXCqgn16PPLXjEwMfGcgEttECeouTpkSMplhyKsPBTIXNYyULTwD7Cx1v1wJyDLR9L0mQ1VPb27fha54yBbGttMpc10WwF1cmkAH2FSF7A7JGez0Z2Z9J0edIZ1MhnuR1ToM09c+N4X7okasgEt9XS2
KZCHzoem21X5zspAuDT1R4FMS12yepE140gJ26n0vLj33uiigEgXWmRpt+CGCsEepZqoePM738BPtaJz17CPu0nuuyXpaxCC3VeRkCv4bfJYFZ06dmJyQTM2tvZc1nb719iyZmc5fmZ60su6H3uVvit520BnM11
2YizGx8mufZLASHb/YktZdca03Y2CQ7eiy+YNGvLN4+nJtm3bxbKJx32316xZw1pbw9KLeWw1944XBEaP3J6eYCe0X1gqNe07bK1WIDbkC0FOR49GuePT5fcf0MX2drPxc00zF7y2tVbwDXF/v1k2+yQ4dPV
pQ5P0uM/nj0CX6UBMFZ86+u7gMYVBYIEqBw7eXAFpZX19zp2/oa6BHySNGTFinP21k9fWggB15omb13zUdeB1Lsdwak/YPeYAFU018Aw9/2Dwyx4SPjFQEYULf3MTYw4Jx7CIVC6H8QoIDNMD+FMG+ZE0d0/t
SH1VAmY56H4qJfMC+Z1d/wg92/tuv2WeeY787j+H2aFDxysGLuSy+o/249DQK0Nmpqa2HjRyoYsZ0XKgnbS2+vZqlurXUsAv19At/ok+e1nBpoNw+Dai9TeksMxDngSh0KrsYshTprc2NhoRf1J11kqirAV198A
ddsSav0B0rscQd77/T50B344tz0Z39+70RbporVerqasyw1Menc81V619VTD1BuqbmfPFsq2W+gyUHuEdo3WR5rabs5jnD31/BNN8ChNaqsT1Ka55kmBwKx+TuJ8XQdQVf307nhTH0CP1s+00UPbaT5TQ6/8qX68u
6LpV67LQsdnknaYgaYrPDx2ZvYGCsnhRKHb/rsf2GDj1MCIkxvRj0uCU1lpwD/zrKx7Z0wBf0vFSSM2ShyaqAOC1Nw+zt9/5YNbN1zfwIdpfngqebv/A6pnWan4q1W1HPgH6Q6oG3N9R0/+StMddtmv2LXJ
PFBpQCGfTgrVU38JfKAw2tpZt1CBdXR0sEgkuhv21u9cxQsYw3ZB1+DgoCM54btU6tUeTPR6e1hy5Fr7IZNDey+e76e9/FCLcA11HpdKKInpaU1X8+111xB9vzNryxQUAY/XVVVJYMDekLU2f2G8BwVQRY1YK
U9bD4V1PHYfHw/zvkR1CgWACHgMoUpdyw3sF3cXU4YHaNSHQdaxdL5jvVXbPeXV90f3RcU0+089NT7Cayf1d+4R1P42gT1q8w66Qf/X4a6FTSMNdcaE/INhYecMMHdyG90A0hodv0aKTu5ZBvO5wd1A4Gq
```

Test your Apache Web server and PHP Server on your EC2 Instance from your **Local ubuntu VM**.

Browser -> <http://ec2-18-216-155-172.us-east-2.compute.amazonaws.com> (Links to an external site.)



Account  
Dashboard  
Courses  
Groups  
Calendar  
Inbox  
History  
Studio  
Request a

## Apache2 Ubuntu 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.

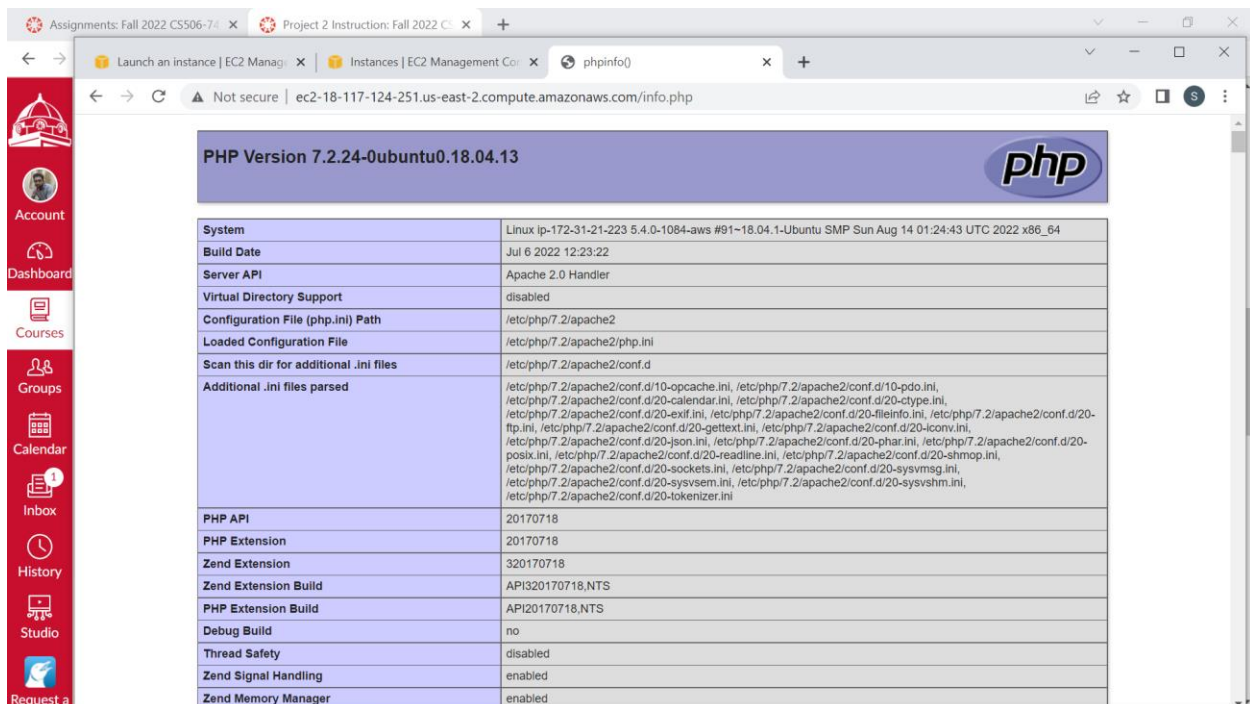
### Configuration Overview

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
```

Browser -> <http://ec2-18-216-155-172.us-east-2.compute.amazonaws.com/info.php>



Account  
Dashboard  
Courses  
Groups  
Calendar  
Inbox  
History  
Studio  
Request a

## PHP Version 7.2.24-0ubuntu0.18.04.13

System	Linux ip-172-31-21-223 5.4.0-1064-aws #91~18.04.1-Ubuntu SMP Sun Aug 14 01:24:43 UTC 2022 x86_64
Build Date	Jul 6 2022 12:23:22
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.2/apache2
Loaded Configuration File	/etc/php/7.2/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.2/apache2/conf.d
Additional .ini files parsed	/etc/php/7.2/apache2/conf.d/10-opcache.ini, /etc/php/7.2/apache2/conf.d/10-pdo.ini, /etc/php/7.2/apache2/conf.d/20-calendar.ini, /etc/php/7.2/apache2/conf.d/20-ctype.ini, /etc/php/7.2/apache2/conf.d/20-exif.ini, /etc/php/7.2/apache2/conf.d/20-fileinfo.ini, /etc/php/7.2/apache2/conf.d/20-ftp.ini, /etc/php/7.2/apache2/conf.d/20-gettext.ini, /etc/php/7.2/apache2/conf.d/20-iconv.ini, /etc/php/7.2/apache2/conf.d/20-json.ini, /etc/php/7.2/apache2/conf.d/20-phar.ini, /etc/php/7.2/apache2/conf.d/20-posix.ini, /etc/php/7.2/apache2/conf.d/20-readline.ini, /etc/php/7.2/apache2/conf.d/20-shmop.ini, /etc/php/7.2/apache2/conf.d/20-sockets.ini, /etc/php/7.2/apache2/conf.d/20-sysmsg.ini, /etc/php/7.2/apache2/conf.d/20-syssem.ini, /etc/php/7.2/apache2/conf.d/20-sysvshm.ini, /etc/php/7.2/apache2/conf.d/20-tokenizer.ini
PHP API	20170718
PHP Extension	20170718
Zend Extension	320170718
Zend Extension Build	API320170718.NTS
PHP Extension Build	API20170718.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled

# Please replace with your host name.

# You should have some feedback from your web server.

## 7. Copy a web server example to your EC2 instance.

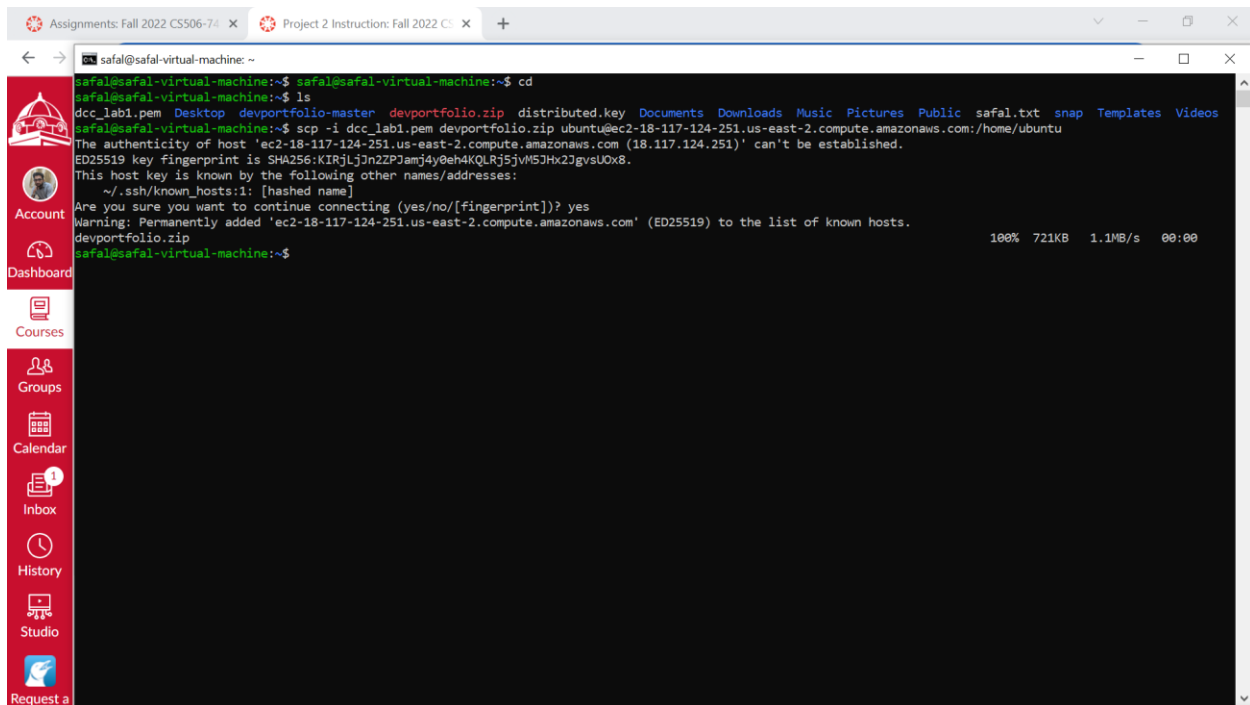
7.1 Download the file "devportfolio.zip" from Canvas to your local ubuntu VM.

7.2 scp the file to your EC2 instance.

In my case:

```
sudo scp -i ~/Downloads/cloud/aws_andy.pem ~/Downloads/cloud/devportfolio.zip  
ubuntu@ec2-18-216-155-172.us-east-2.compute.amazonaws.com:/var/www/html/
```

Please replace the pem file, the path of the zip file, and host name with yours.



The screenshot shows a terminal window with a red sidebar on the left containing icons for Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, and Request a. The terminal output is as follows:

```
safal@safal-virtual-machine: ~  
safal@safal-virtual-machine:~$ safal@safal-virtual-machine:~$ cd  
safal@safal-virtual-machine:~$ ls  
dcc_lab1.pem Desktop devportfolio-master devportfolio.zip distributed.key Documents Downloads Music Pictures Public safal.txt snap Templates Videos  
safal@safal-virtual-machine:~$ scp -i dcc_lab1.pem devportfolio.zip ubuntu@ec2-18-117-124-251.us-east-2.compute.amazonaws.com:/home/ubuntu  
The authenticity of host 'ec2-18-117-124-251.us-east-2.compute.amazonaws.com (18.117.124.251)' can't be established.  
ED25519 key fingerprint is SHA256:KIRjLj7n2ZPamj4y0eh4KQLRj5jvM5JHx2JgvsU0x8.  
This host key is known by the following other names/addresses:  
~/.ssh/known_hosts:1: [hashed name]  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'ec2-18-117-124-251.us-east-2.compute.amazonaws.com' (ED25519) to the list of known hosts.  
devportfolio.zip  
safal@safal-virtual-machine:~$
```

At the bottom right of the terminal window, the transfer progress is shown: 100% 721KB 1.1MB/s 00:00.

7.3 Unzip the zip file on your EC2 instance.

```
$ sudo apt install zip unzip
```



```
Assignments: Fall 2022 CS506-74 x Project 2 Instruction: Fall 2022 C: x +
ubuntu@ip-172-31-21-223: ~
ubuntu@ip-172-31-21-223:~$ ls /home/ubuntu/
devportfolio.zip  safal.txt
ubuntu@ip-172-31-21-223:~$ sudo apt install unzip
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  zip
The following NEW packages will be installed:
  unzip
0 upgraded, 1 newly installed, 0 to remove and 28 not upgraded.
Need to get 168 kB of archives.
After this operation, 567 kB of additional disk space will be used.
Get:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 unzip amd64 6.0-21ubuntu1.1 [168 kB]
Fetched 168 kB in 0s (14.1 MB/s)
Selecting previously unselected package unzip.
(Reading database ... 59422 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-21ubuntu1.1_amd64.deb ...
Unpacking unzip (6.0-21ubuntu1.1) ...
Setting up unzip (6.0-21ubuntu1.1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
ubuntu@ip-172-31-21-223:~$
```

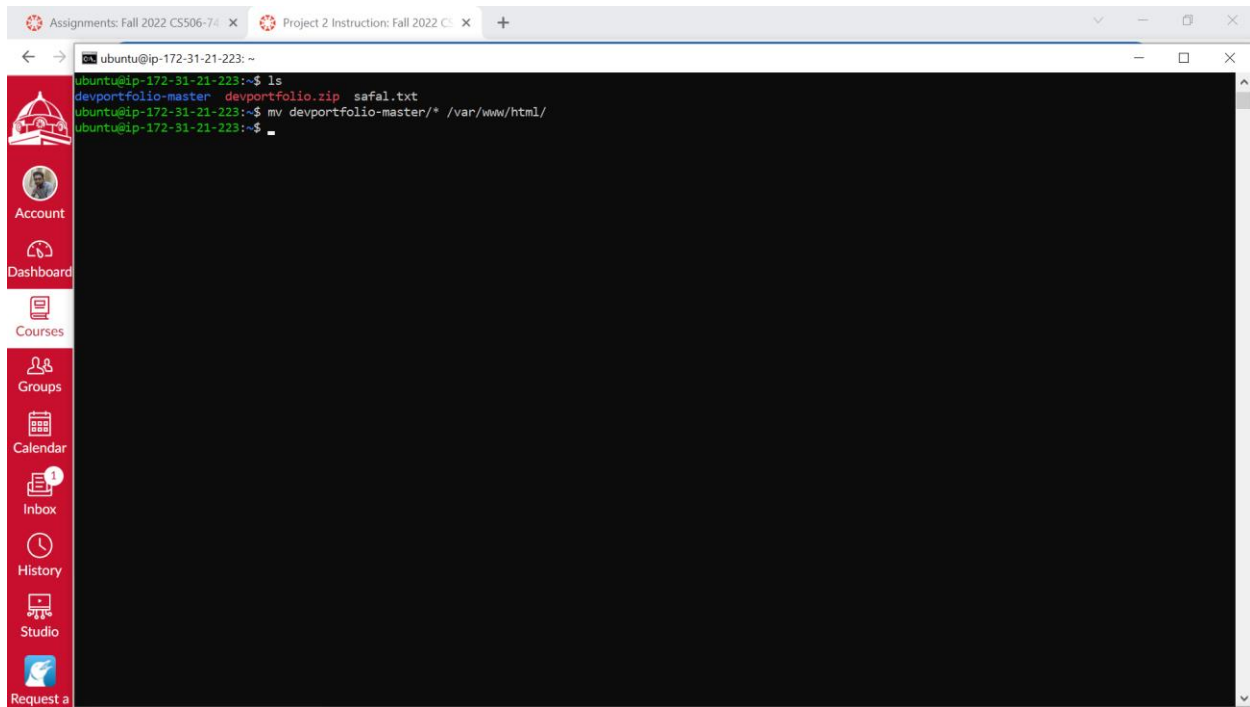
```
$ cd /var/www/html/
```

```
$ ls
```

```
# make sure you can find the file devportfolio.zip
```

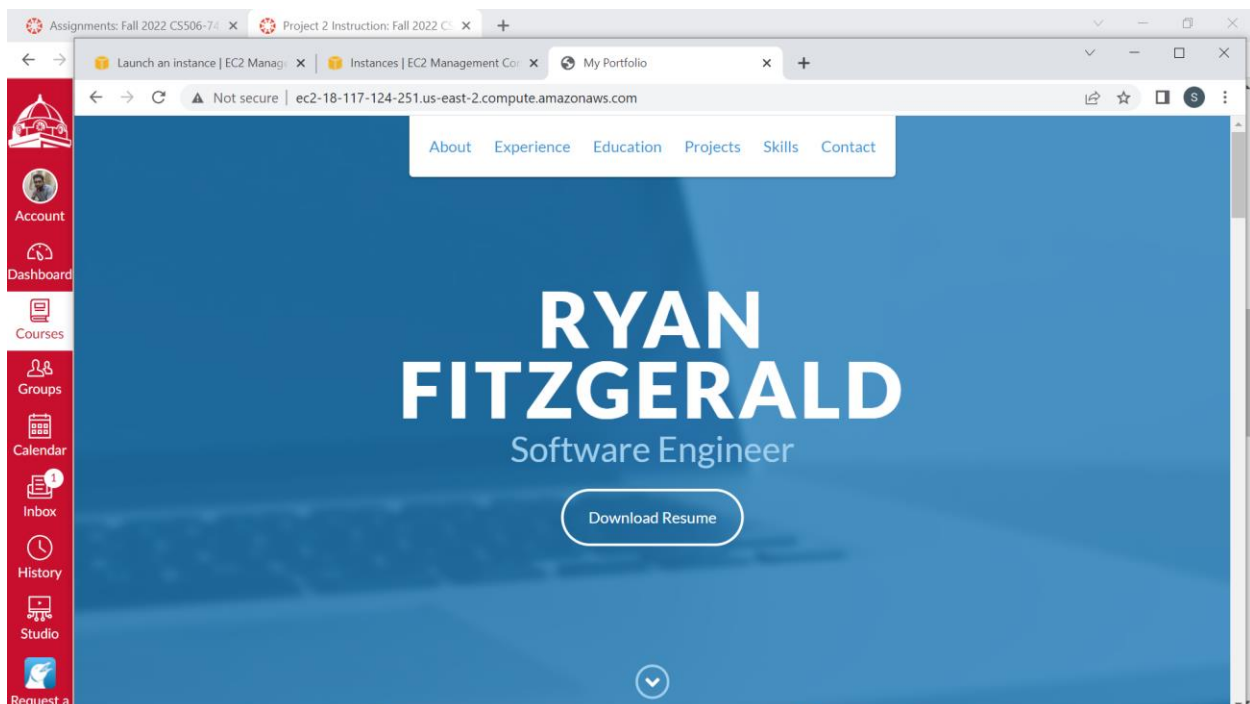
```
$ unzip devportfolio.zip
```

```
Assignments: Fall 2022 CS506-74 x Project 2 Instruction: Fall 2022 C: x +
ubuntu@ip-172-31-21-223: ~
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
ubuntu@ip-172-31-21-223:~$ clear
ubuntu@ip-172-31-21-223:~$ unzip devportfolio.zip
Archive:  devportfolio.zip
34912e567a154133be5bf7d58b7cf75ba36af5d0
  creating: devportfolio-master/
  extracting: devportfolio-master/.gitignore
  inflating: devportfolio-master/LICENSE.md
  inflating: devportfolio-master/README.md
    creating: devportfolio-master/css/
  inflating: devportfolio-master/css/bootstrap.min.css
  inflating: devportfolio-master/css/styles.css
  inflating: devportfolio-master/favicon.ico
  inflating: devportfolio-master/gulpfile.js
    creating: devportfolio-master/images/
  inflating: devportfolio-master/images/lead-bg.jpg
  inflating: devportfolio-master/images/project.jpg
  inflating: devportfolio-master/index.html
    creating: devportfolio-master/js/
  inflating: devportfolio-master/js/scripts.js
  inflating: devportfolio-master/js/scripts.min.js
    creating: devportfolio-master/libs/
    creating: devportfolio-master/libs/font-awesome/
    creating: devportfolio-master/libs/font-awesome/css/
  inflating: devportfolio-master/libs/font-awesome/css/font-awesome.css
  inflating: devportfolio-master/libs/font-awesome/css/font-awesome.min.css
    creating: devportfolio-master/libs/font-awesome/fonts/
  inflating: devportfolio-master/libs/font-awesome/fonts/FontAwesome.otf
  inflating: devportfolio-master/libs/font-awesome/fonts/FontAwesome-webfont.eot
  inflating: devportfolio-master/libs/font-awesome/fonts/FontAwesome-webfont.svg
  inflating: devportfolio-master/libs/font-awesome/fonts/FontAwesome-webfont.ttf
  inflating: devportfolio-master/libs/font-awesome/fonts/FontAwesome-webfont.woff
  inflating: devportfolio-master/libs/font-awesome/fonts/FontAwesome-webfont.woff2
    creating: devportfolio-master/libs/font-awesome/less/
  inflating: devportfolio-master/libs/font-awesome/less/animated.less
  inflating: devportfolio-master/libs/font-awesome/less/bordered-pulled.less
  inflating: devportfolio-master/libs/font-awesome/less/core.less
  inflating: devportfolio-master/libs/font-awesome/less/fixed-width.less
  inflating: devportfolio-master/libs/font-awesome/less/font-awesome.less
  inflating: devportfolio-master/libs/font-awesome/less/icons.less
```



8. Access your web server on your EC instance from your **local windows machine**.

Browser -> <http://ec2-18-216-155-172.us-east-2.compute.amazonaws.com/devportfolio-master/index.html>



# Please replace with your host name.



