# Installation and Setup of LEMP and LAMP stack in on VM Box .

Objective : Install linux in VM box and setup LAMP and LEMP stack.

# INDEX

## What is Oracle Virtual Box

Oracle VirtualBox is a powerful open source virtualization software developed by Oracle Corporation. It allows users to run multiple operating systems simultaneously on a single physical machine, making it ideal for developers, testers, and IT professionals. Below is a brief description of its main features and uses:

## Key Features :

- **Cross-Platform Compatibility**
- **Guest Operating System Support**
- **Snapshots and Cloning**
- **Seamless Mode and Scaled Mode**
- **Virtual Networking**
- **Extensibility**

## Use Cases :

- **Development and Testing**
- **Training and Education**
- **Legacy Application Support**
- **Sandboxing**

## Download and Installation Of VM Box in Windows

### Step 1 :

- **Search Oracle Virtual Box on Browser.**
- 


### Step 2 :

- **Click on Windows Host , Download(latest version) will automatically start.**

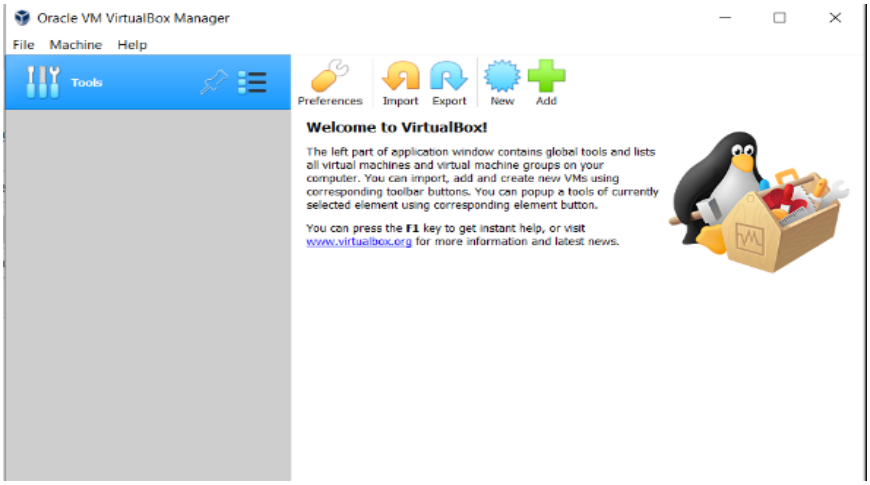
### Step 3 :Now open the Download folder and open the VM Box application.

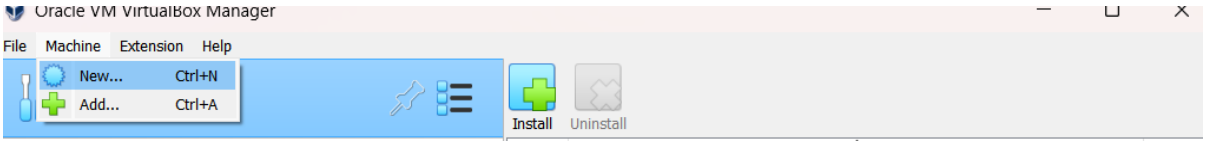

### Step 4 :

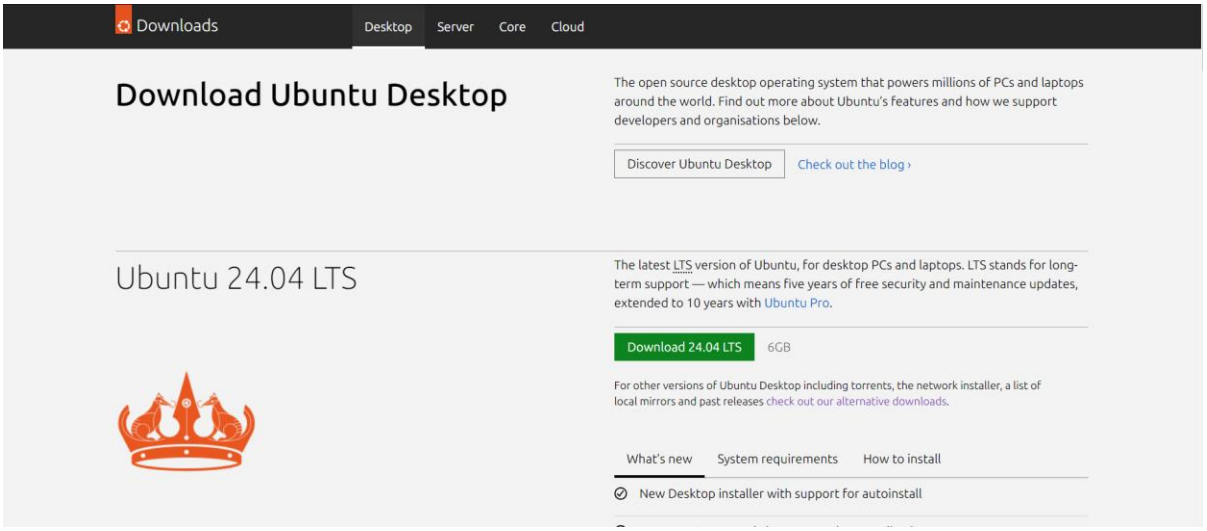
- **Click on next and proceed to allow VM Box to install.**


- This will be the final interface after successful installation.

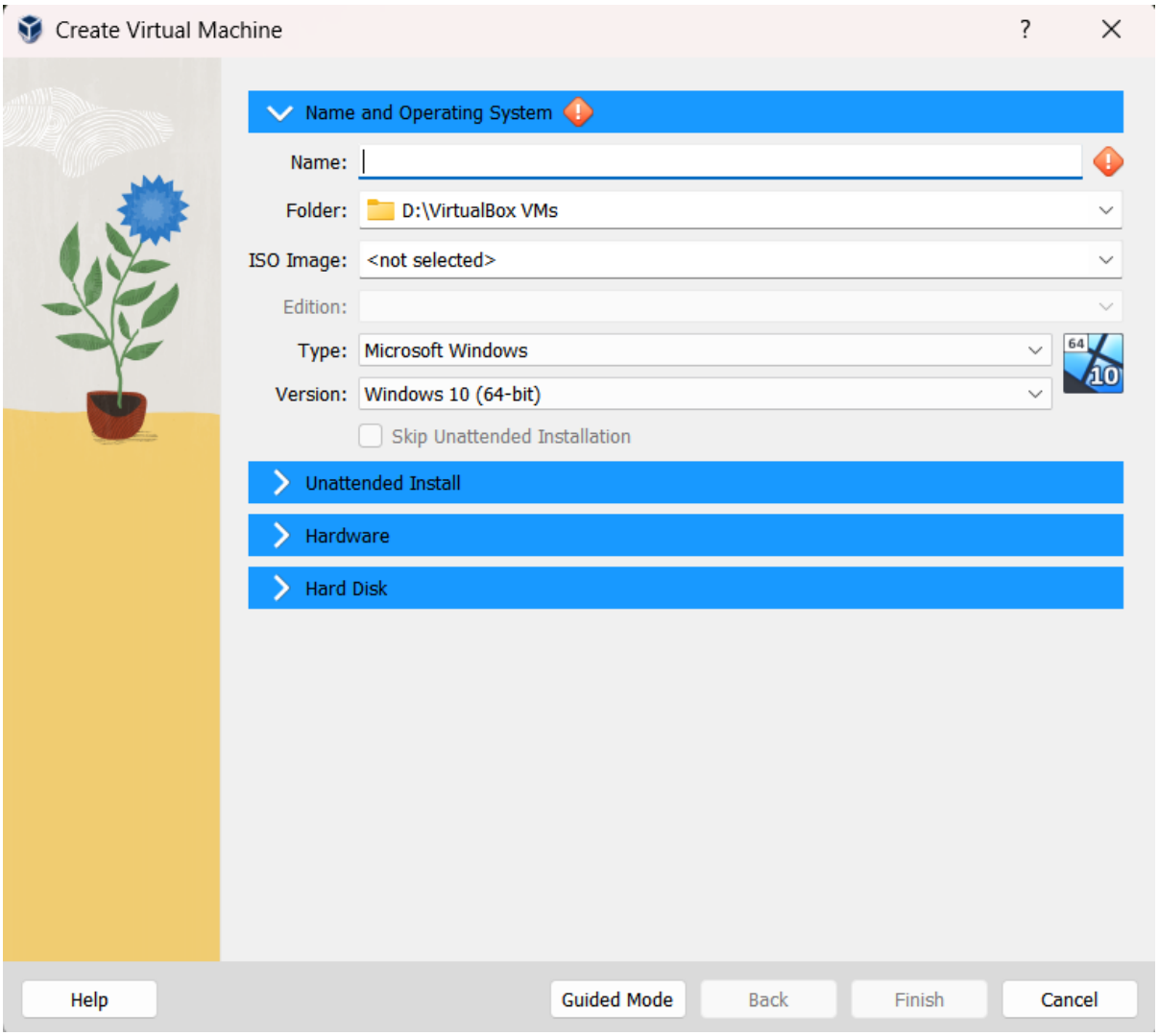
# Creation of first machine.




- **As I have shown VM box will automatically start after installation , so above shown picture will be interface of application.**
- **Now click on Machine in the menu bar**
- 

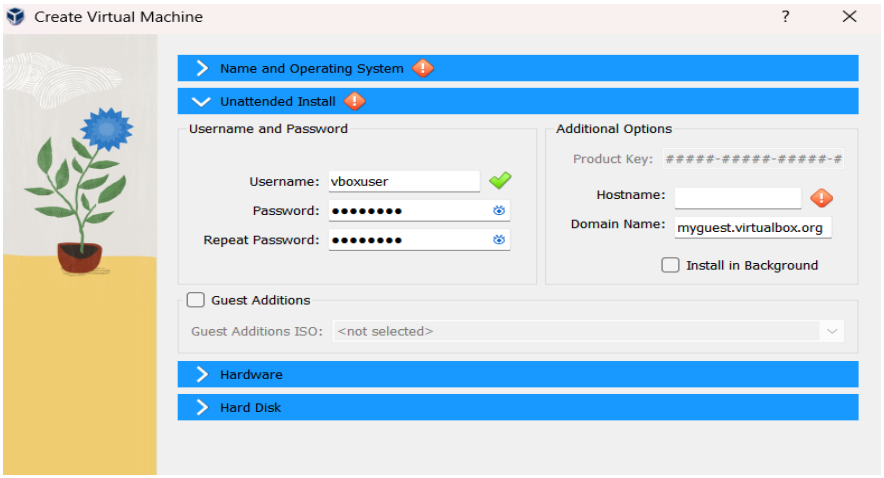
- **Click on "New" to create your first machine.**
- **Now download ISO image file of ubuntu from [https://ubuntu.com](https://ubuntu.com).**
- 

- **Click on Download 24.04 LTS and an ISO image file will be downloaded.**

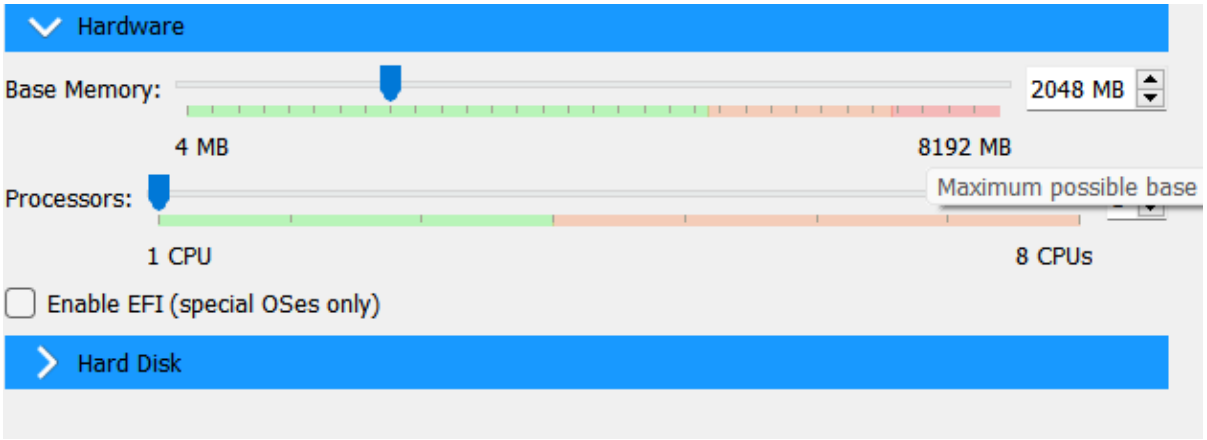



- **Click on Drop Down button of ISO Image tab and add the downloaded file.**
- **Give the name of the machine you want to give , let it be something meaningful.**

- **After that go to Unattended Install button and give the username and password for accessing Ubuntu on the machine.**

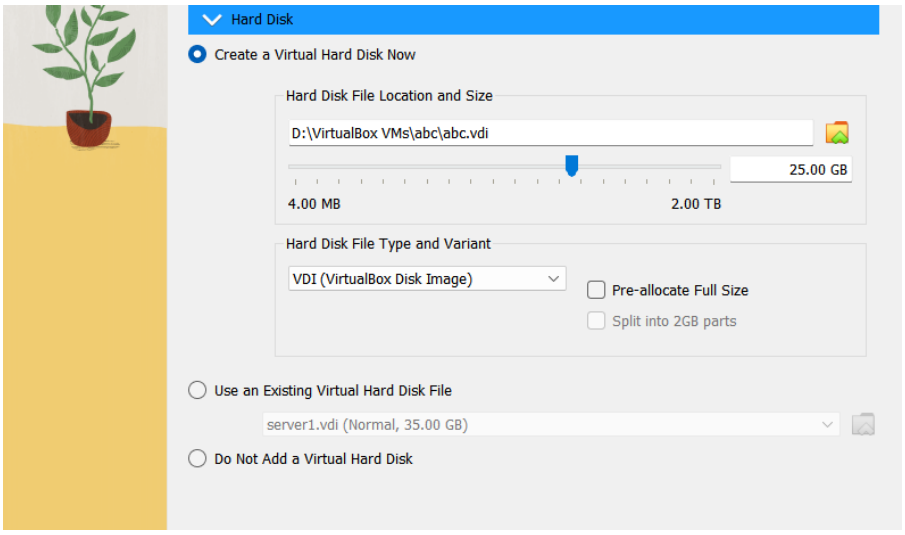



- 
- **You can change the default username password here.**
- **Now open the Hardware Button clicking on it :**




- 
- **Now, it is up to you to give the memory and processor to the Machine , but for installing LAMP and LEMP stack and after that wordpress , so ideal configuration would be 1 GB of base memory and 2 Processors.**

- **After that come to hard disk button at the last :**

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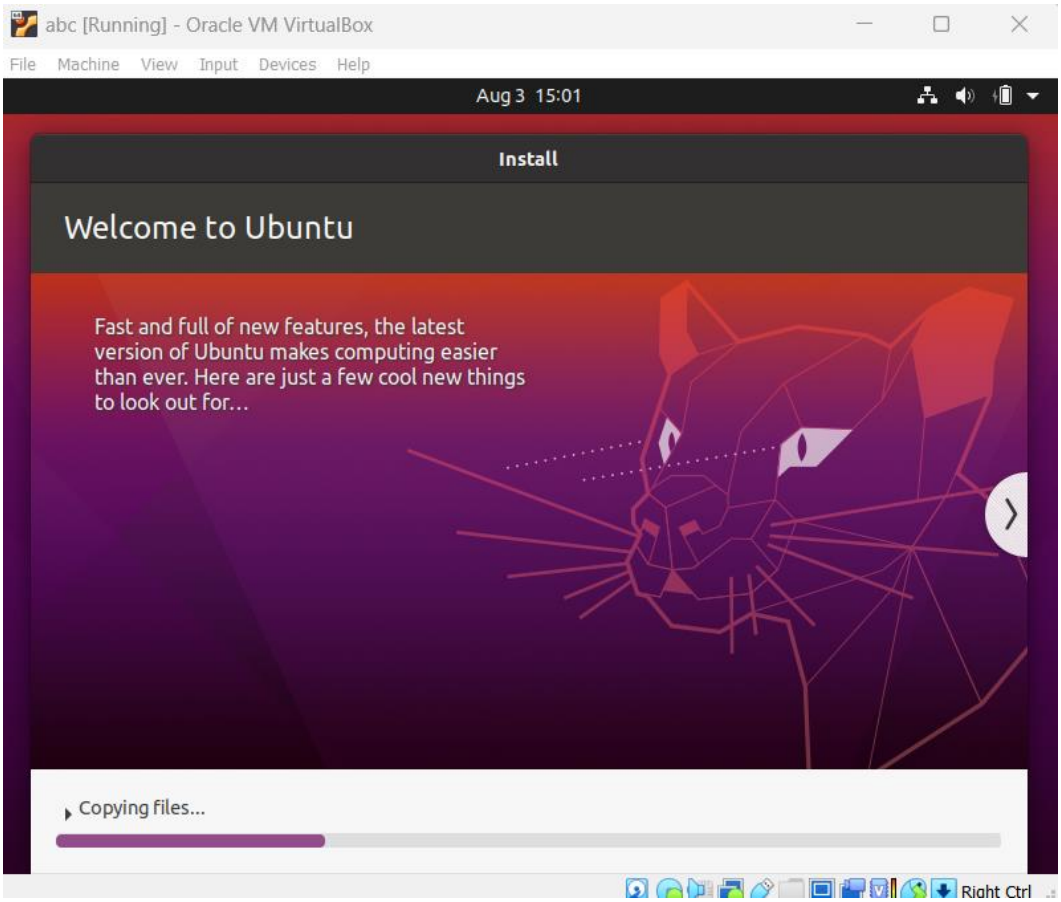
- **20 - 25 GB of storage would be more than sufficient for the Machine**
- **Now click on finish button at the bottom and your first machine will be made after some processing time.**




- **This will be the interface of installation of ubuntu on VM .**

# Installation of LAMP stack (Linux, Apache, Mysql &Php)

- **Brief Introduction of LAMP stack :**

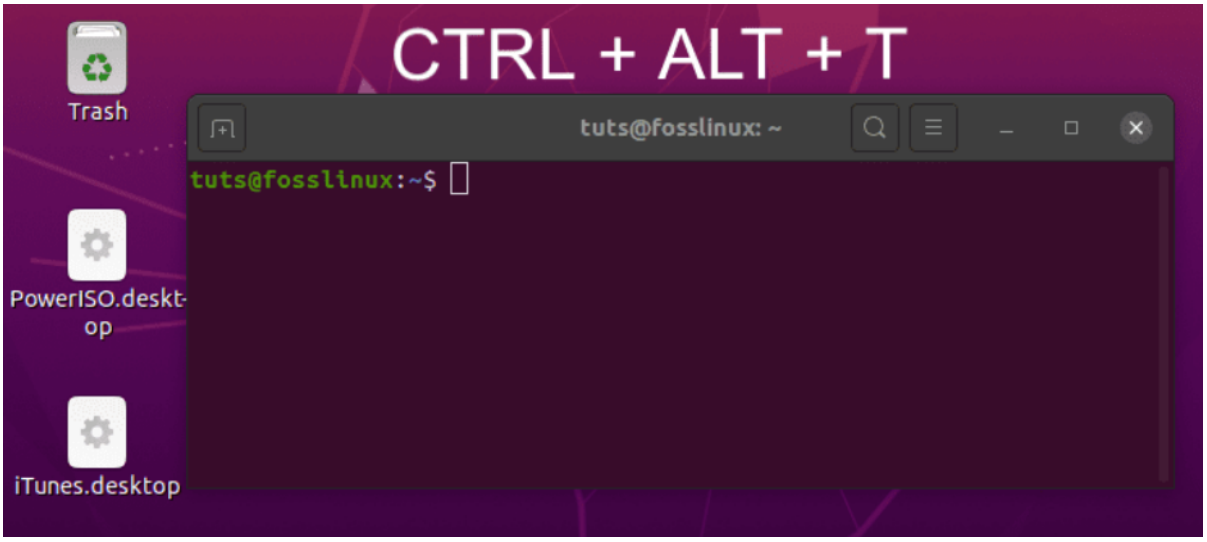
**The LAMP stack is a widely used collection of open-source software for web development. It consists of:**

1. **Linux: The operating system.**
2. **Apache: The web server.**
3. **MySQL: The database system.**
4. **PHP: The programming language (alternatively, Perl or Python).**

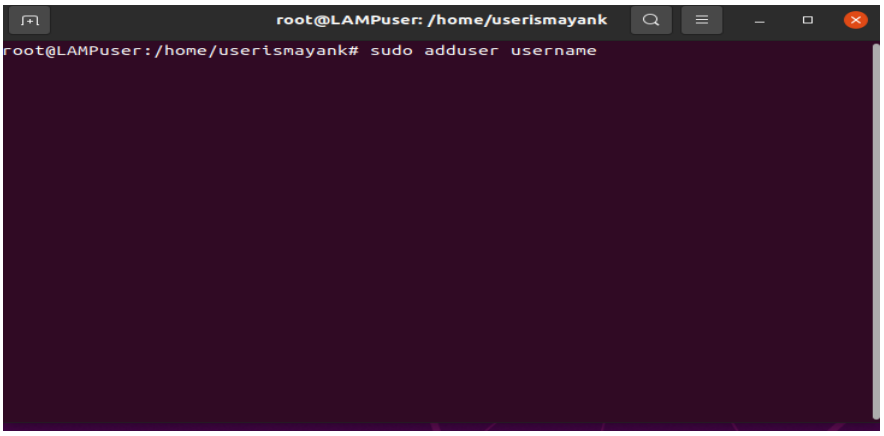
**This combination creates a powerful environment for creating and deploying dynamic websites and applications.**

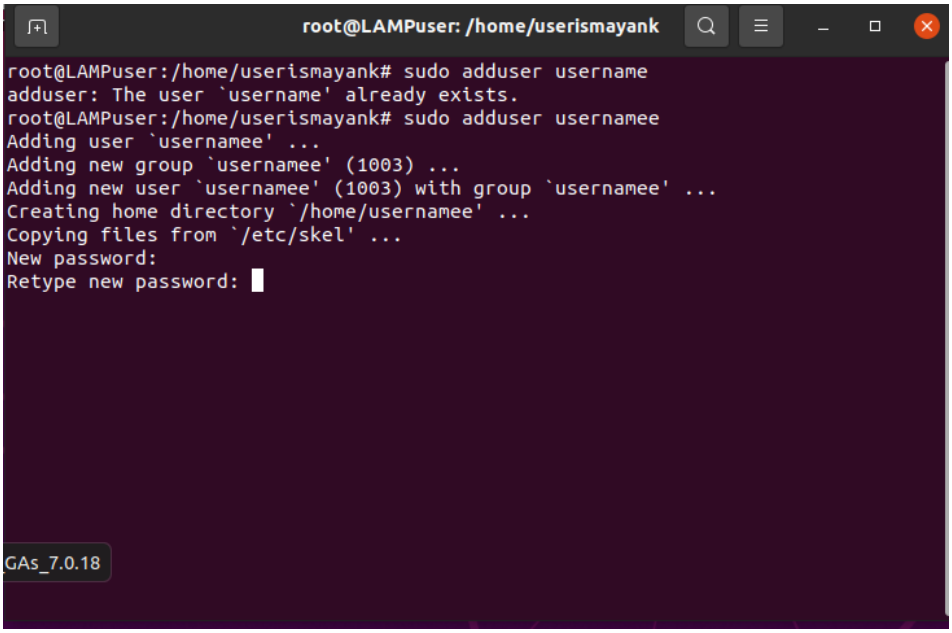
**Step 1 :**

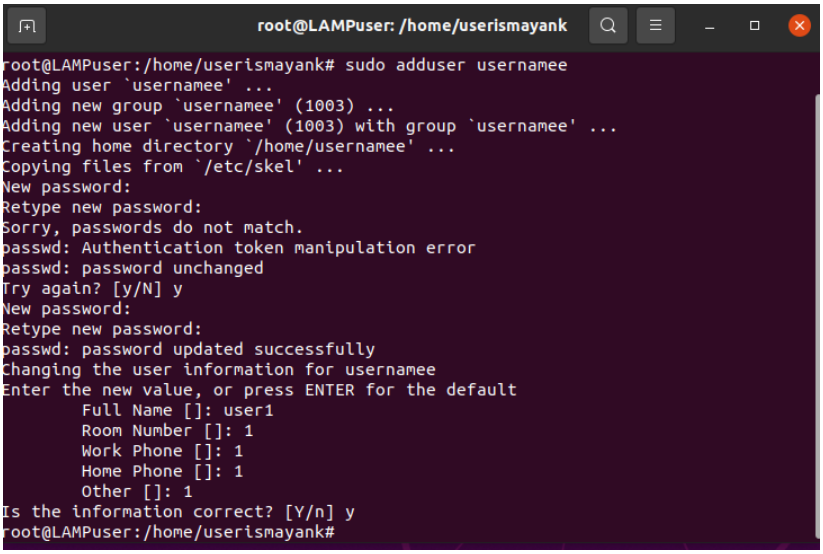
- **As we have installed ubuntu linux already so first part is done of Linux.**
- **Now open the terminal in Ubuntu by pressing Ctrl+Alt+T.**



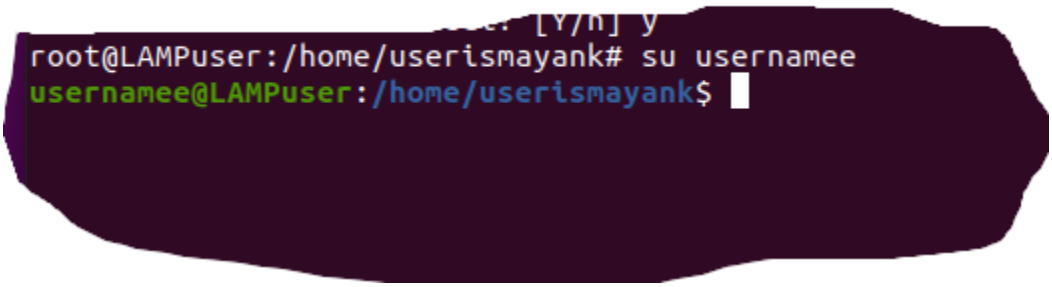

- **Make a sudo user (A sudo user can execute commands with superuser privileges using the sudo command.) , ref to the below image :**

- 

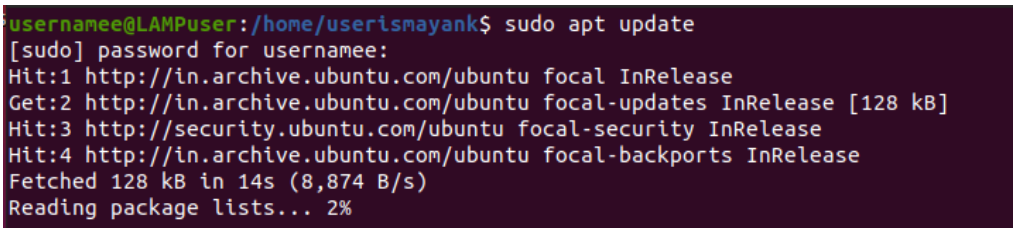
- **Create and Confirm the password for the user and all other basic details.**
- 

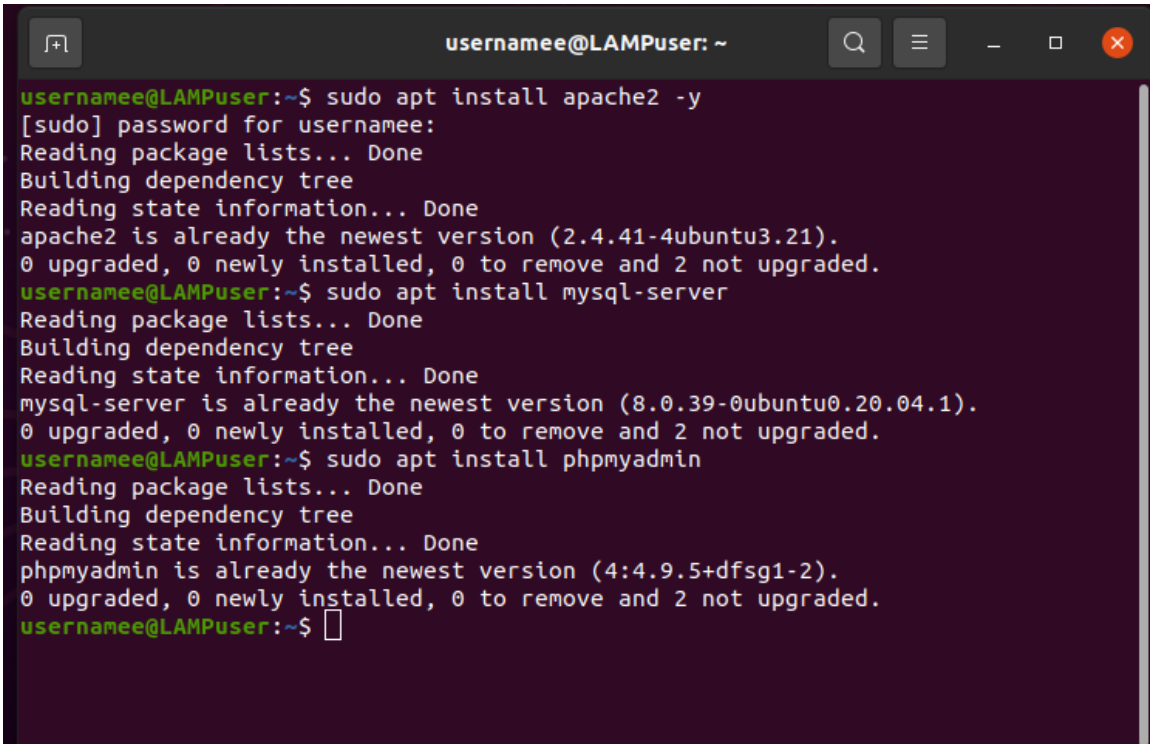
- **After filling all the details you will see something like this :**
- 

- **Now switch to sudo user by referring following image :**




- **Now apply multiple commands in terminal to install apache, mysql-server and phpmyadmin:**

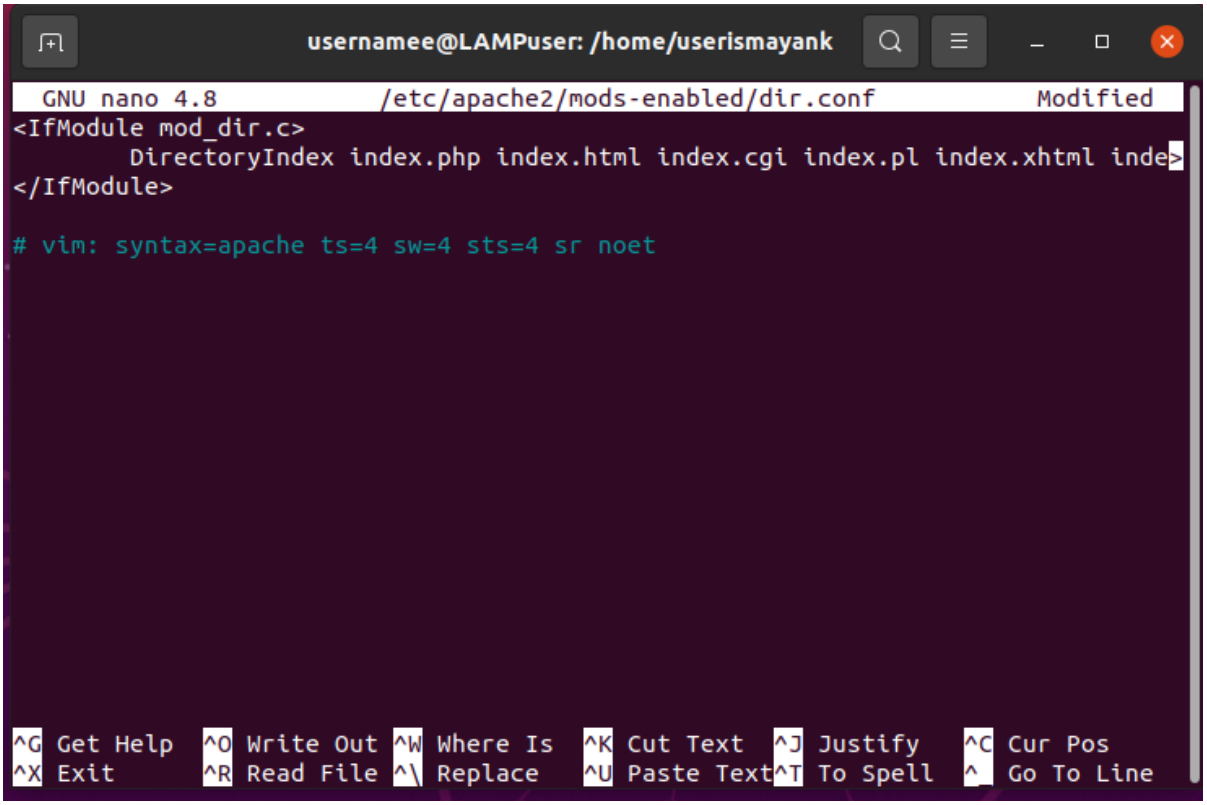


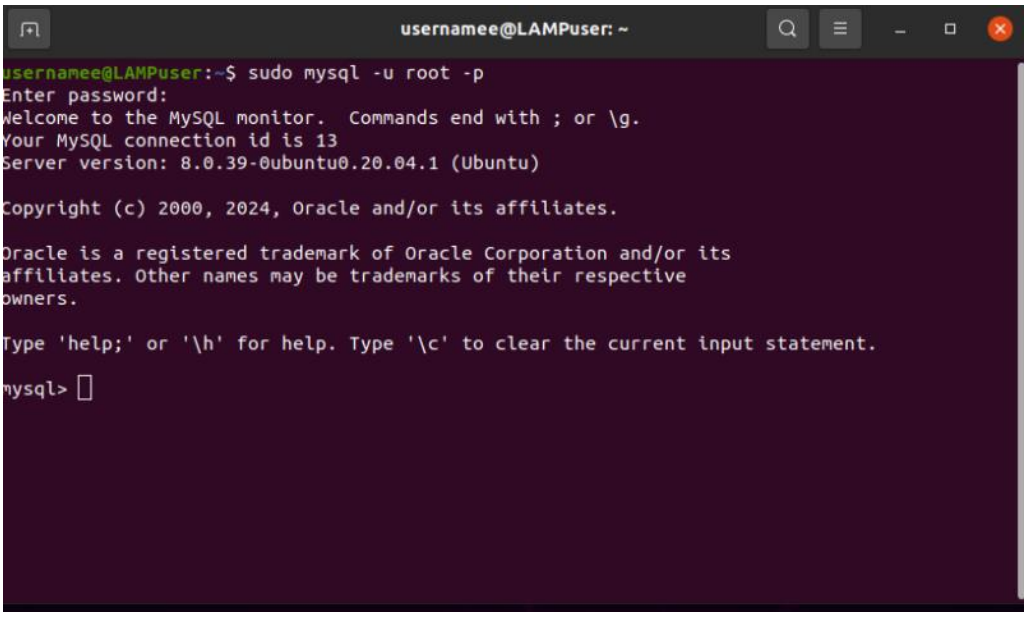




**Command to install :**

- **Apache : sudo apt install apache2**
- **Mysql : sudo apt install mysql-server**
- **PhpMyAdmin : sudo apt install phpmyadmin**

**Make the index.php file first in the queue in the dir.conf file which can be access through nano /etc/apache2/mods-enabled/dir.conf**

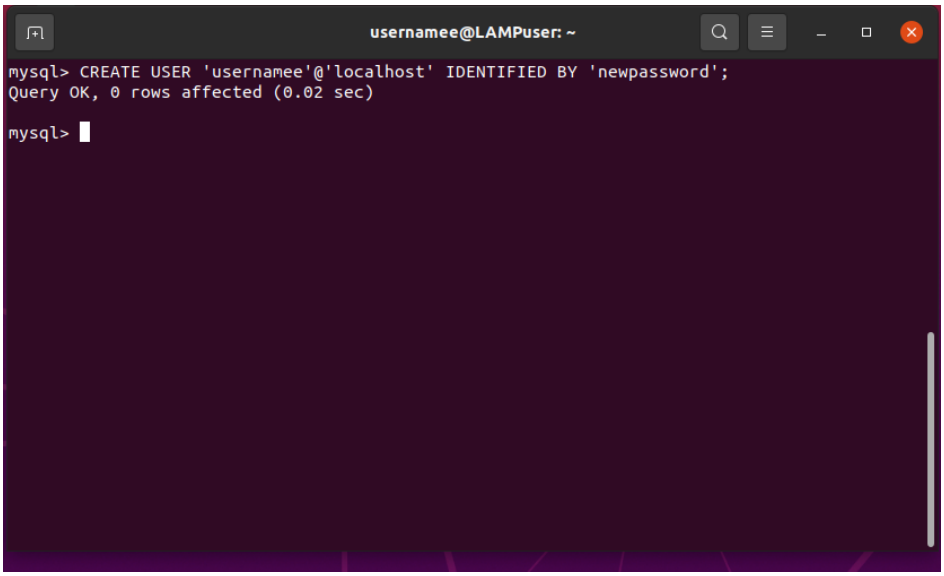
- 

- **Now setup mysql to create a database :**
- 

- **Access mysql by giving command : sudo mysql -u root**
-

**Create database : CREATE DATABASE dbname ;**

- **Now create user :**

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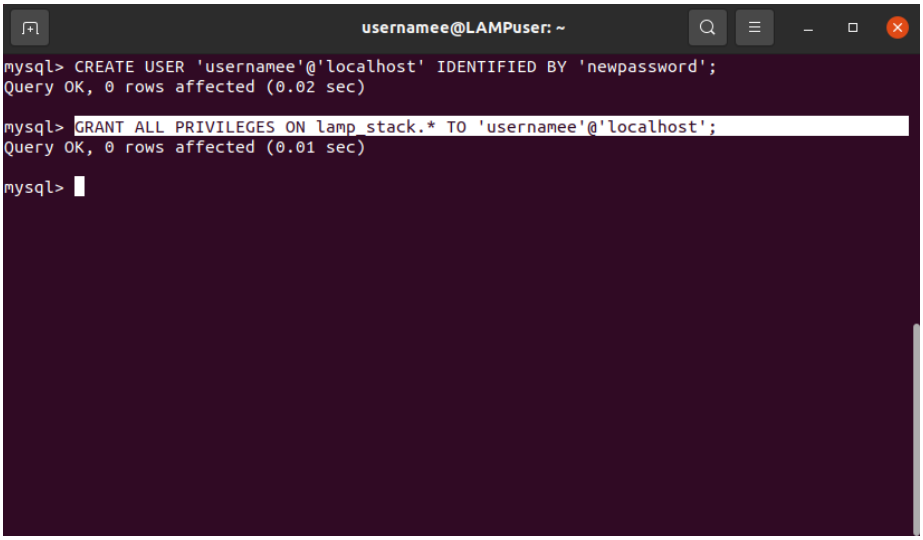
- **Grant all privileges of the database to created user.**

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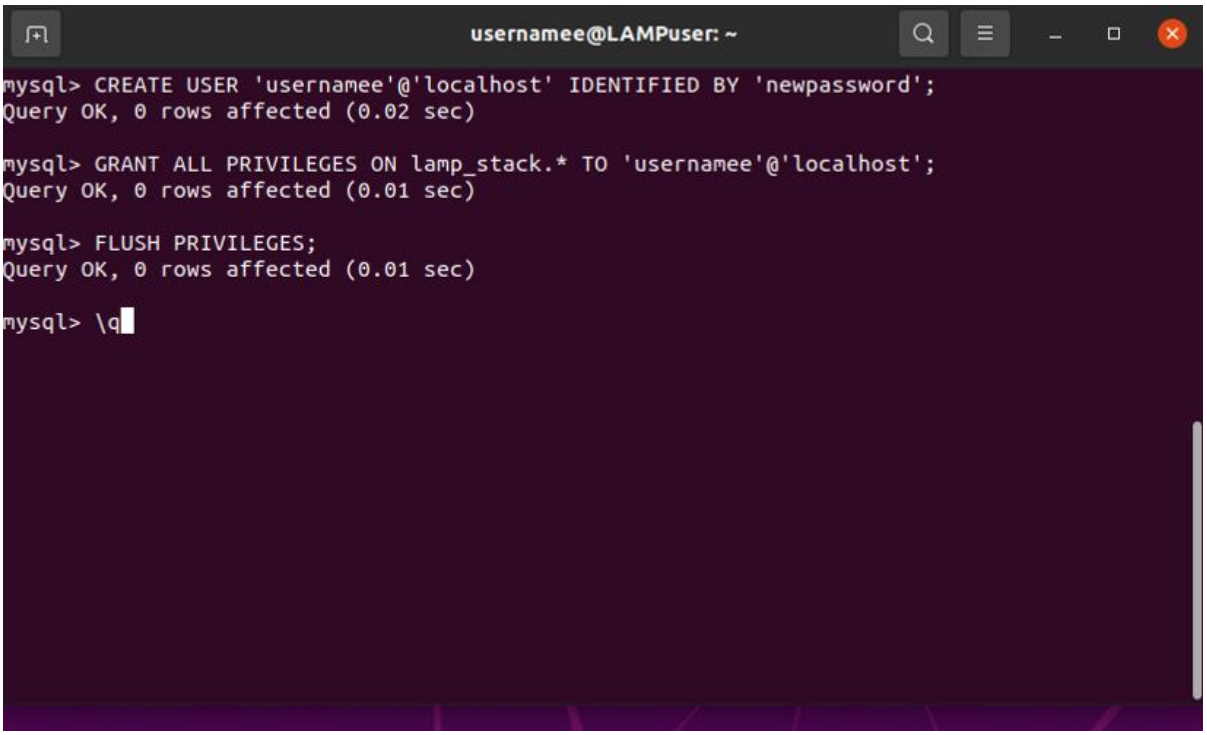
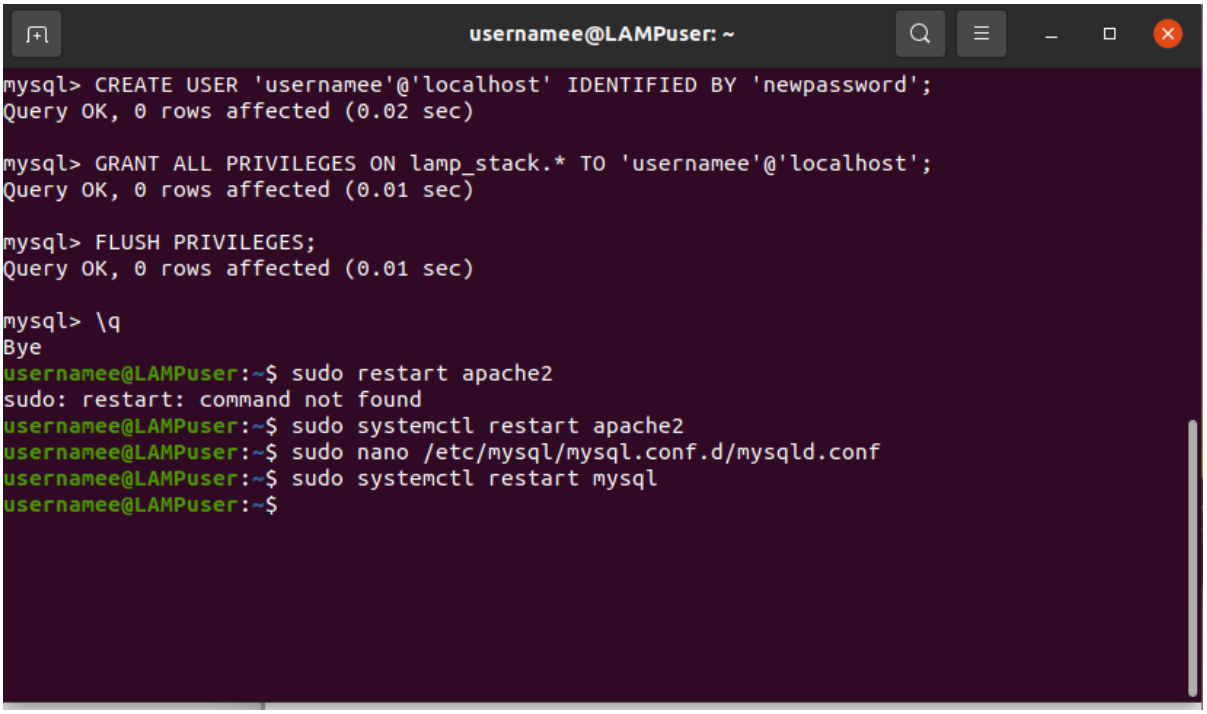
- **Now reload the grant tables from the disk and clear the cache for faster access by FLUSH PRIVILEGES command.**

- 

- **Restart apache server by sudo systemctl restart apache2 command.**
- 

- **Now open phpmyadmin on localhost by : localhost/phpmyadmin/ on browser.**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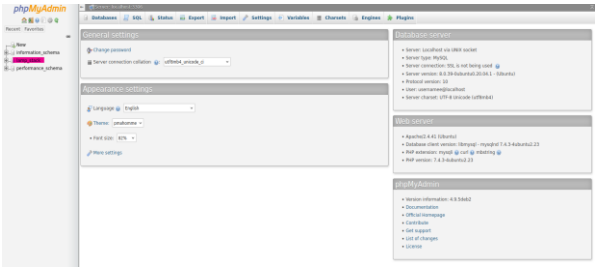
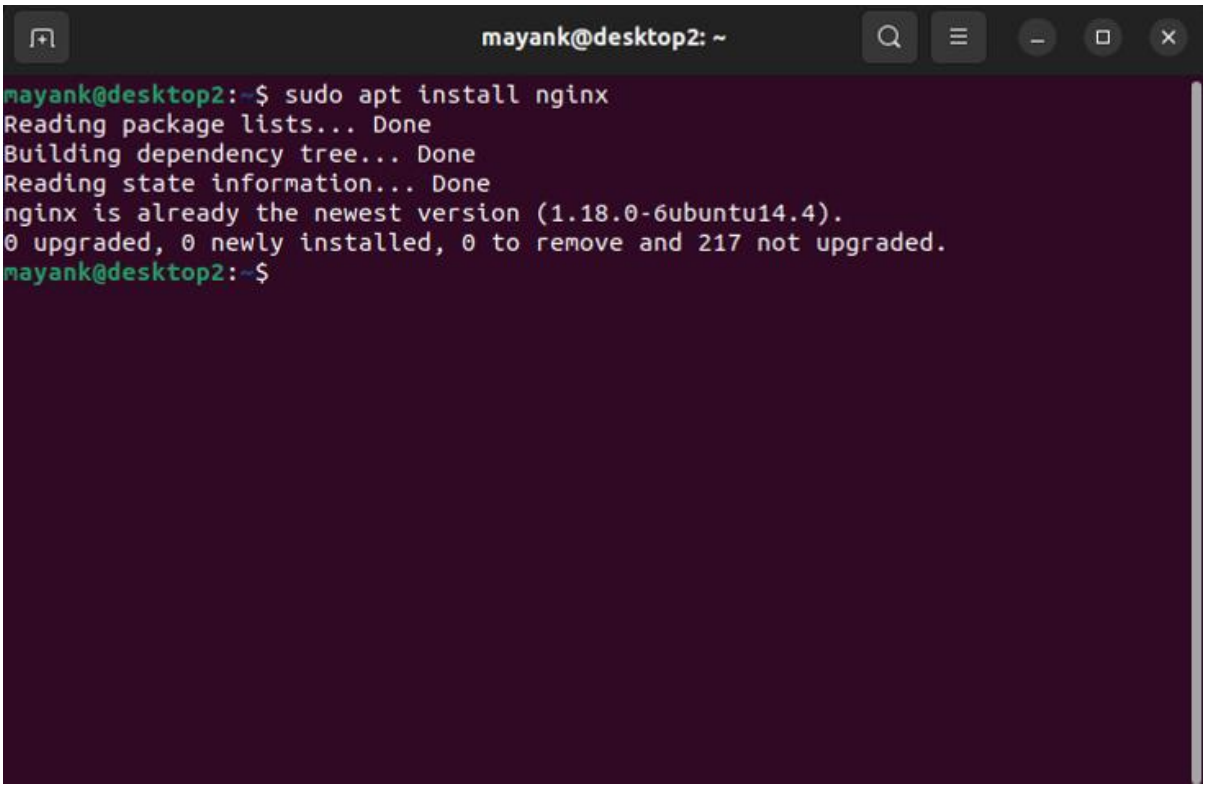
- **Access phpmyadmin by entering username and password entered while we were creating user in mysql.**
- 
- **Now we can see in databases dashboard our database named lamp_stack is created.**

## Installation of LEMP stack (Linux nginx mysql & Php )

- **We will create new machine with same process of existing machine to build LEMP on it in which Linux is already installed.**
- **Now first we have to install nginx server .**




- **To install nginx , give command : sudo apt install nginx.**
- **Now download mysql like we have downloaded in LAMP stack.**

```
mayank@desktop2: ~
Building dependency tree... Done
Reading state information... Done
nginx is already the newest version (1.18.0-6ubuntu14.4).
0 upgraded, 0 newly installed, 0 to remove and 217 not upgraded.
mayank@desktop2:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be upgraded:
  mysql-server
1 upgraded, 0 newly installed, 0 to remove and 216 not upgraded.
Need to get 9,468 B of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 mysql-server
all 8.0.39-0ubuntu0.22.04.1 [9,468 B]
Fetched 9,468 B in 1s (7,437 B/s)
(Reading database ... 212779 files and directories currently installed.)
Preparing to unpack .../mysql-server_8.0.39-0ubuntu0.22.04.1_all.deb ...
Unpacking mysql-server (8.0.39-0ubuntu0.22.04.1) over (8.0.36-0ubuntu0.22.04.1)
...
Setting up mysql-server (8.0.39-0ubuntu0.22.04.1) ...
mayank@desktop2:~$
```

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- **Setup the mysql similarly like we did in LAMP stack.**
- **Now we need to download php :**

```
mayank@desktop2:~$ sudo apt install php-fpm php-mysql
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  php8.3-bz2 php8.3-cli php8.3-common php8.3-curl php8.3-fpm php8.3-gd
  php8.3-mbstring php8.3-mysql php8.3-opcache php8.3-phpdbg php8.3-readline
  php8.3-xml php8.3-zip
Suggested packages:
  php-pear
The following NEW packages will be installed:
  php8.3-fpm php8.3-mysql
The following packages will be upgraded:
  php-fpm php-mysql php8.3-bz2 php8.3-cli php8.3-common php8.3-curl php8.3-gd
  php8.3-mbstring php8.3-opcache php8.3-phpdbg php8.3-readline php8.3-xml
  php8.3-zip
13 upgraded, 2 newly installed, 0 to remove and 203 not upgraded.
Need to get 7,858 kB/7,873 kB of archives.
```

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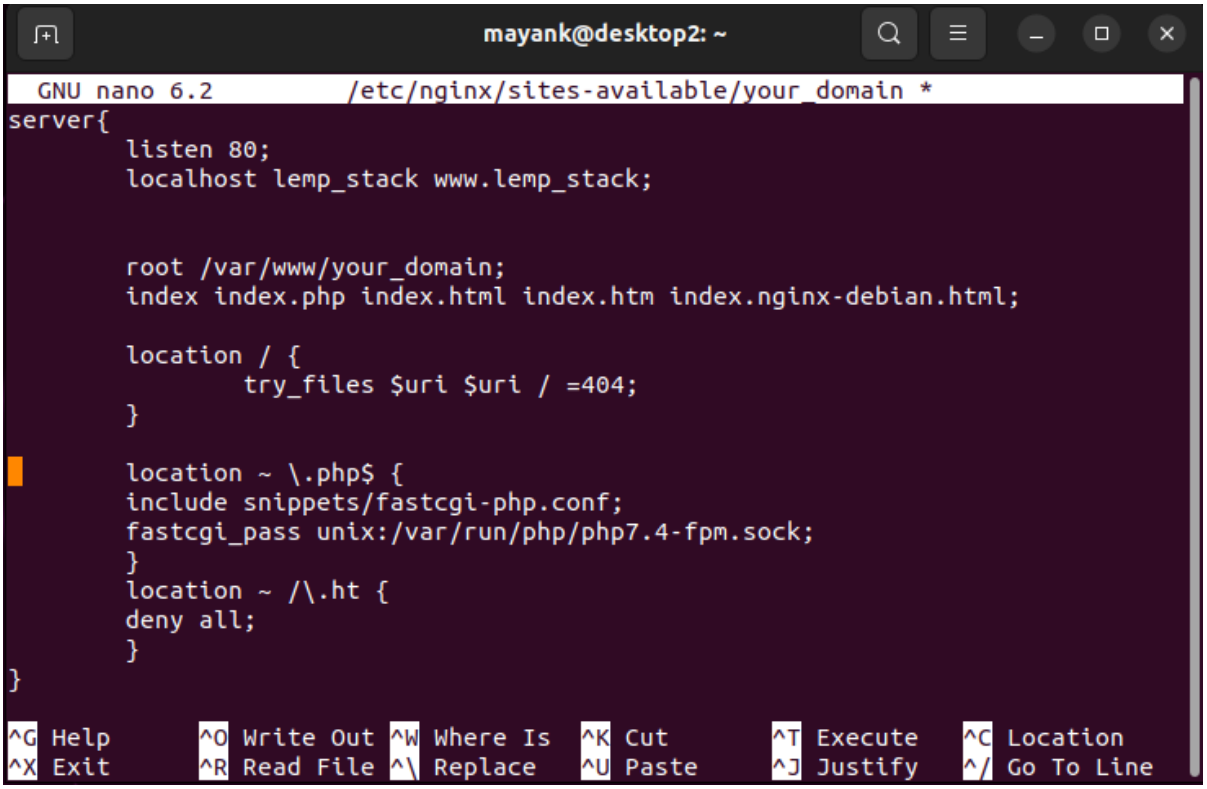
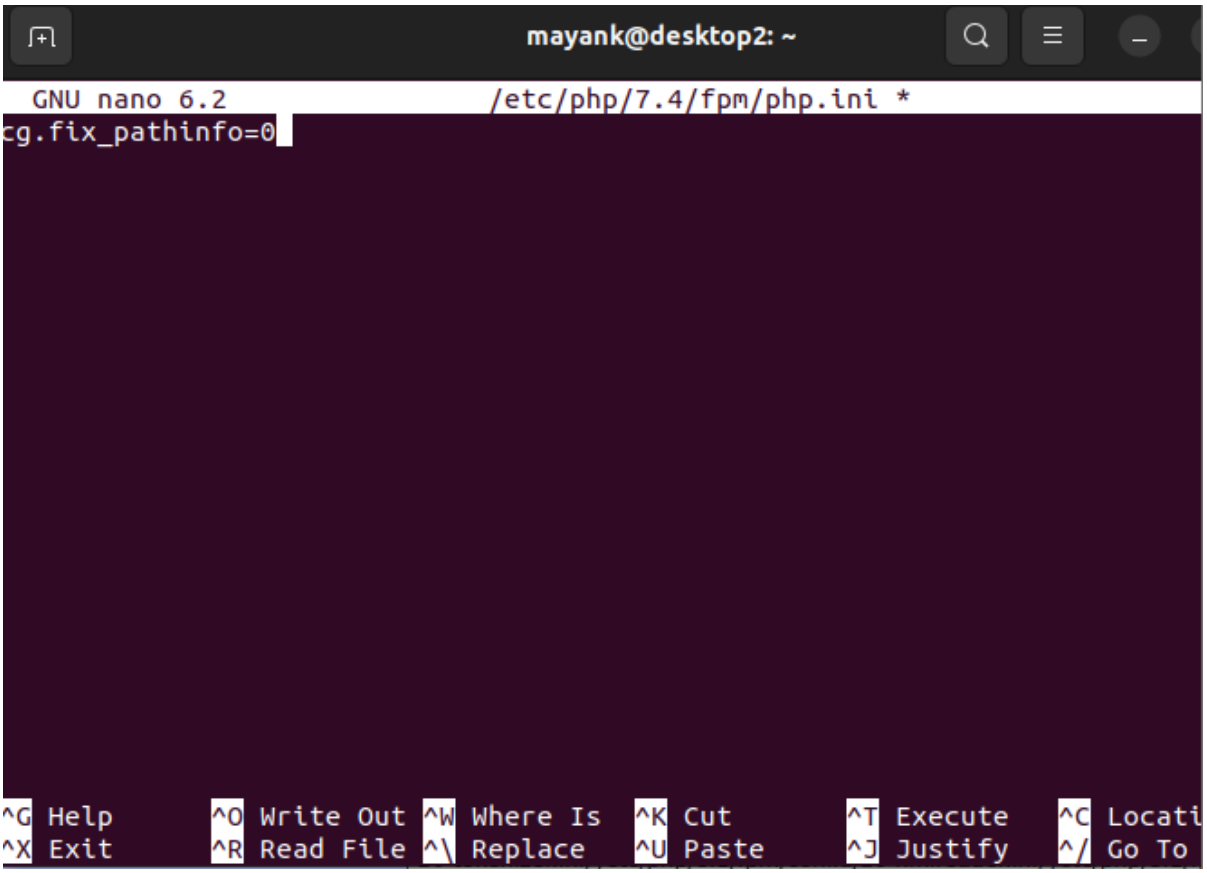
- **Allow to take space while installing anything , by pressing “y”**
- **Configure Nginx to Use PHP Processor :**

- **Create a new server block for your website. Open a new configuration file in Nginx's sites-available directory:**




- **LEMP stack is now successfully installed.**
- **Add this code to the server block.**
- **Adjust PHP Processor Configuration**
- **Open the PHP configuration file for Nginx :sudo nano /etc/php/7.4/fpm/php.ini**




- **Make sure that cg.fix_path=0**
- **Exit and save the file.**

**LEMP stack is now successfully installed.**

**Check by typing localhost on the browser you will get the following interface.**