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Spring Semester
Year 2022-23

SAÉ 1.03 | VM

Installation Guide

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INFO

Preface

- The purpose of this guide is to explain how to install LUBUNTU 20.04 version, with the SFML (Simple and Fast Multimedia Library) computer development library and an Apache and PHP server.
- It is in the framework of a task carried out by us at the university institute of technology of Annecy-Le-Vieux that this guide was conceived.
- The authors of the installation guide are three computer science students:
 - LAKOUISS Yanis
 - MIHOUBI Marouane
 - RABEHI Milhane
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Table of Contents

Preface	2
1. Introduction: using this guide	4
1.1. Purpose	4
1.2. Scope	4
1.3. System Organization	4
1.4. Technical support	4
2. Installation procedures	5
2.1. Describing the main steps	5
2.2. Before installing: Prerequisites	5
2.3. Preparing to install	5
3. Configuring VirtualBox	6
4. Installing LUBUNTU 20.04	9
5. Installing a development environment	14
5.1. Installing Visual Studio Code	14
5.2. Installing C# language and .NET	15
5.3. Installing SFML library	17
6. Configuring file sharing	18
7. Installing Apache server	20
8. Installing PHP	21
9. Testing	23
9.1. - SFML program drawing a rectangle	23
9.2. – Verification of the presence of the Apache server	24
9.3. -Verification of the presence of PHP	24
10. Complementary	25

1. Introduction: using this guide

1.1. Purpose

This guide is used to install LUBUNTU 20.04 with VIRTUALBOX, to set up a computer development environment with the C# language and the SFML library. Afterwards we will see the sharing of files between machines and the setting up of Apache and PHP servers.

1.2. Scope

You can use this system when you have a stable connection and a computer environment to work in

By the end of this guide, you will be able to code a game in C# SFML, share files with a machine, and deploy an Apache and PHP server.

1.3. System Organization

First, we will see which configuration to use on VIRTUALBOX. Then we will proceed to the installation of the LUBUNTU 20.04 OS. We will then see how to set up a good development environment with C# as language, and SFML as library. We will then see how to perform a folder sharing on the OS. Finally, we will put an Apache and PHP server on our machine.

1.4. Technical support

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2. Installation procedures

2.1. Describing the main steps

- Step **1**: Configuration of VIRTUALBOX.
- Step **2**: installation of the LUBUNTU 20.04 operating system.
- Step **3**: installation of Visual Studio Code
- Step **4**: installation of C# and SFML.
- Step **5**: setting up folder sharing.
- Step **6**: installation of the Apache server.
- Step **7**: installation of PHP.

2.2. Before installing: Prerequisites

To complete this guide, you will need a computer, monitor, keyboard and mouse, a good Internet connection and the “Oracle VirtualBox” software available free of charge on the Internet.

2.3. Preparing to install

To start this guide, you must be on a Windows environment, if this is the case, then start by going to this site: <https://lubuntu.me/downloads/> and download LUBUNTU version 20.04.5. Keep the downloaded zip file in your downloads.

20.04.5 LTS (Focal Fossa)

Supported until April 2023

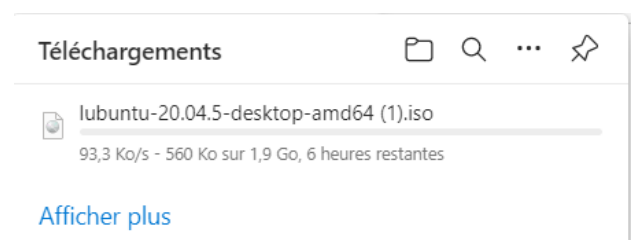
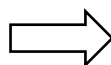
⚠ Please read [the release announcement](#) before downloading. ⚠

LXQt Version: 0.14.1

It's better to use the [u](#) (magnet) link first (auto-verified downloads).

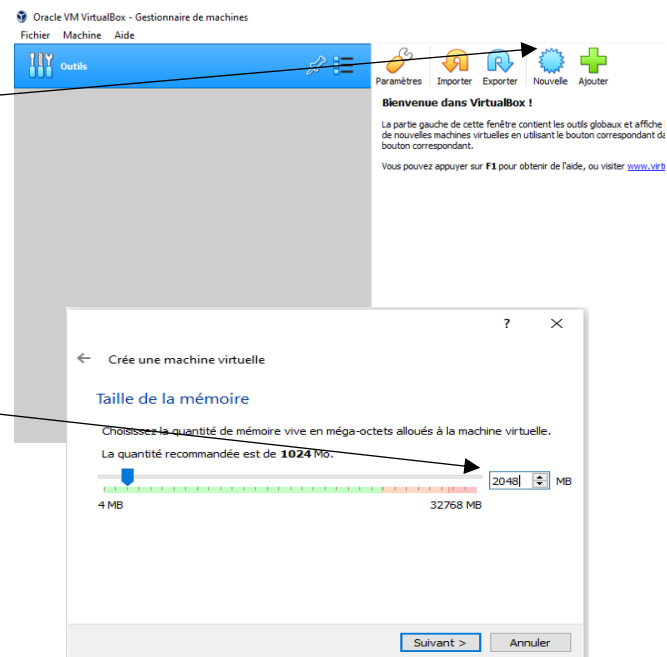
⚠ Note: make sure to verify the integrity ([SHA256sums](#)) of your downloads and that they come from an official source. More info [here](#).

Desktop 64-bit



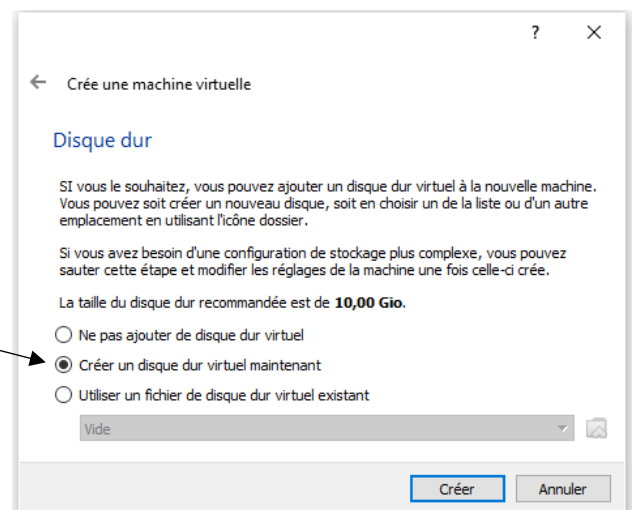
3. Configuring VirtualBox

Launching VirtualBox, click on "Nouvelle".

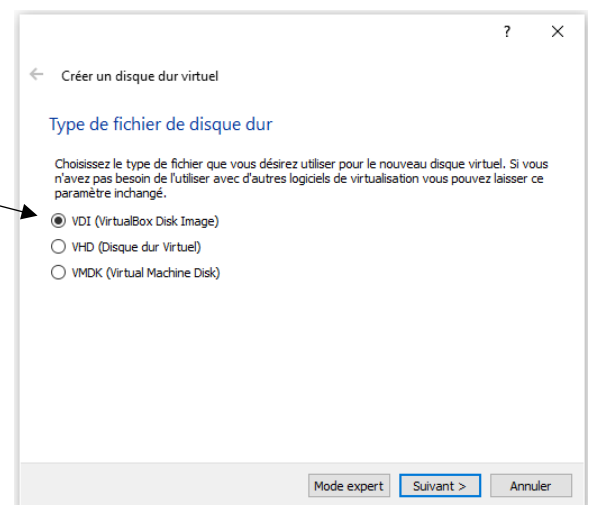


Setting the amount to 2048 MB

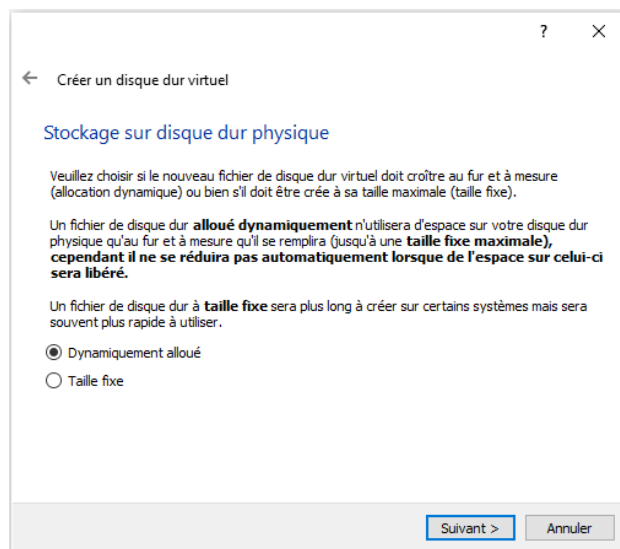
click on



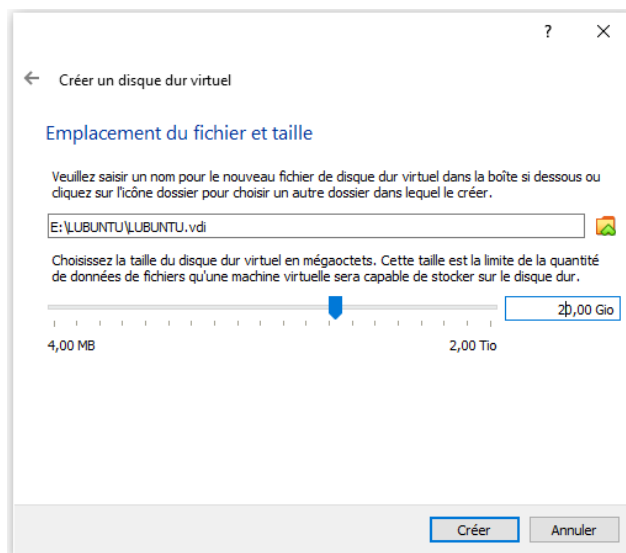
and on



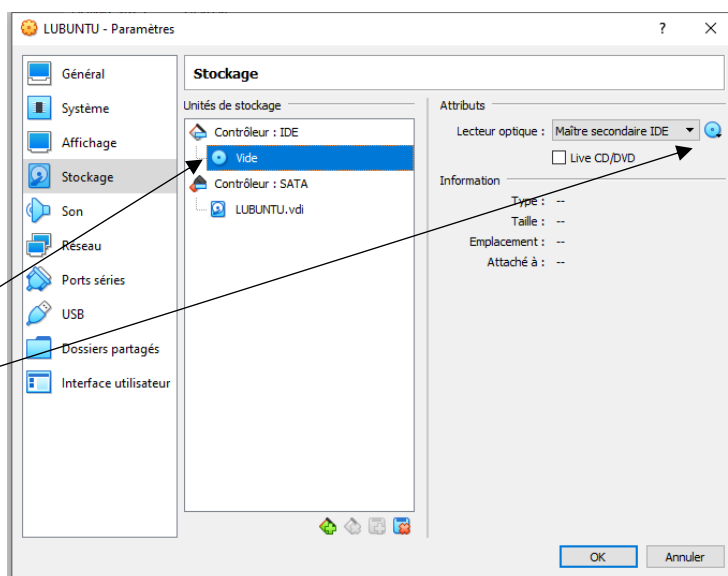
For the disk size: choosing
"Dynamiquement alloué"



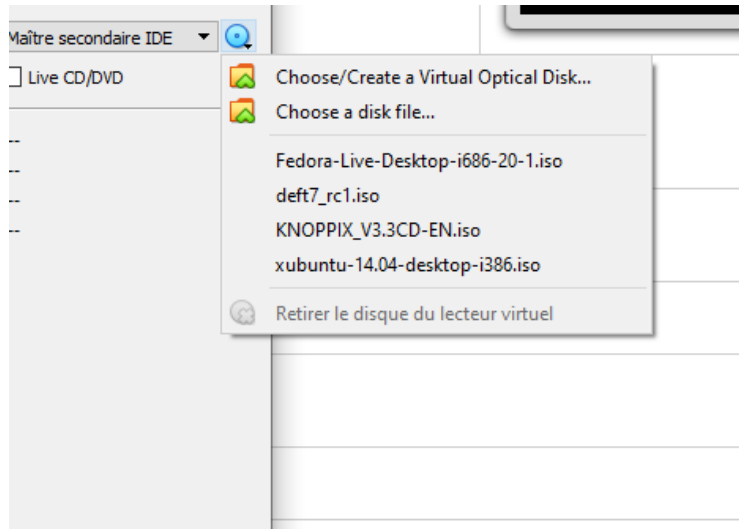
For LUBUNTU 20.04 choosing a
storage size of 20Gio and
choosing the backup location of
your machine.



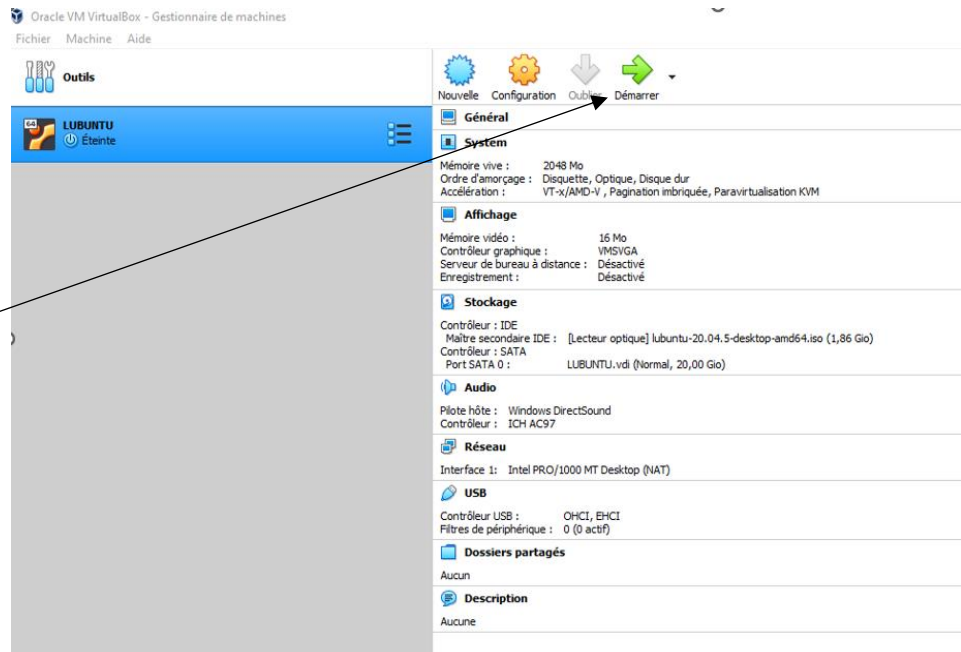
Clicking on configuration,
And going to the
storage tab and click on
"contrôleur : IDE".



Adding the
previously downloaded zip
file by clicking on
"Choose/create a virtual
optical Disk ...".

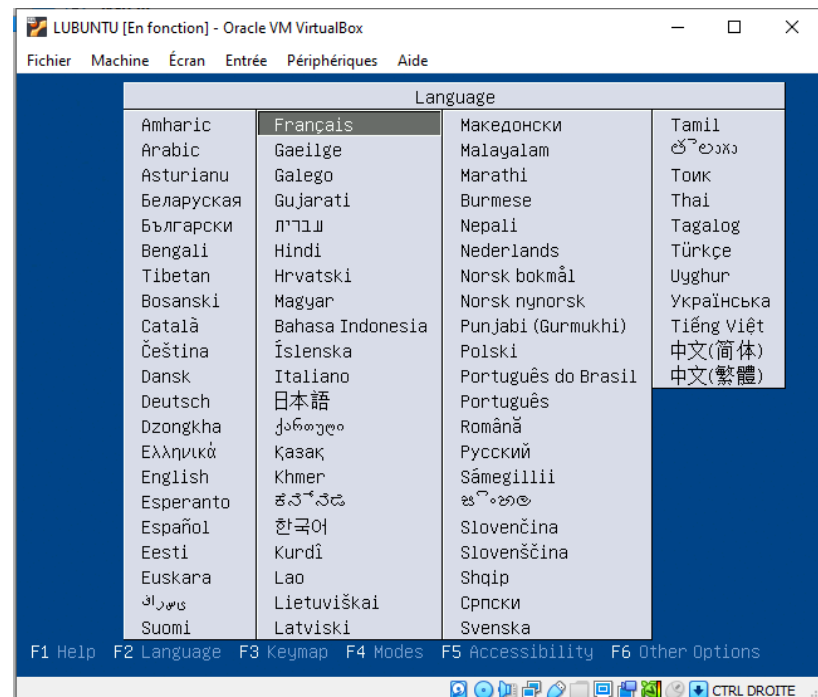


Starting the OS

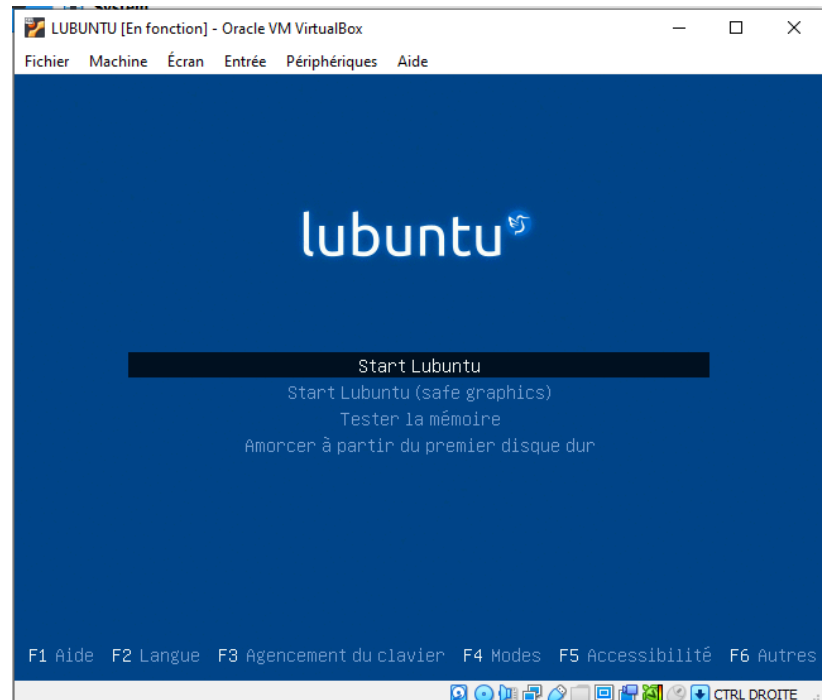


4. Installing LUBUNTU 20.04

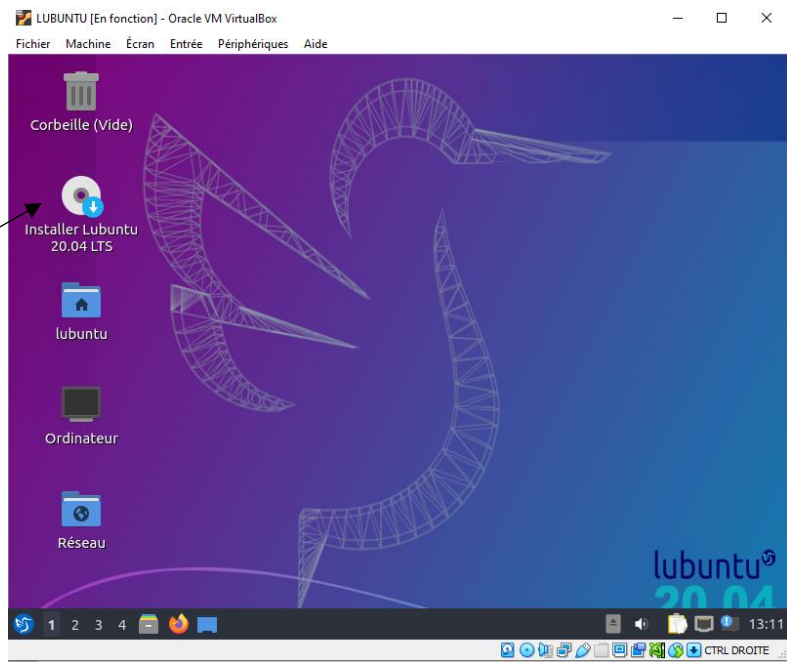
Choosing the language



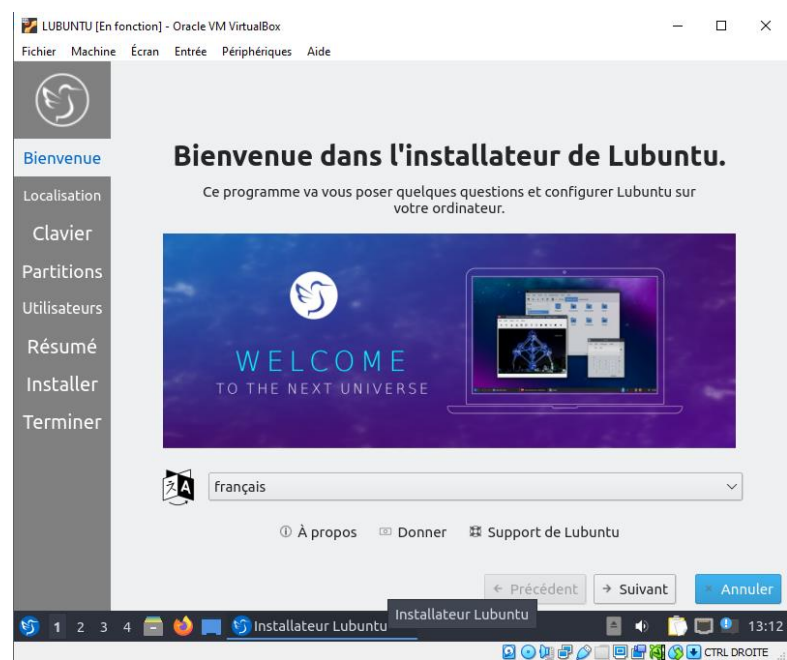
Launching of OS



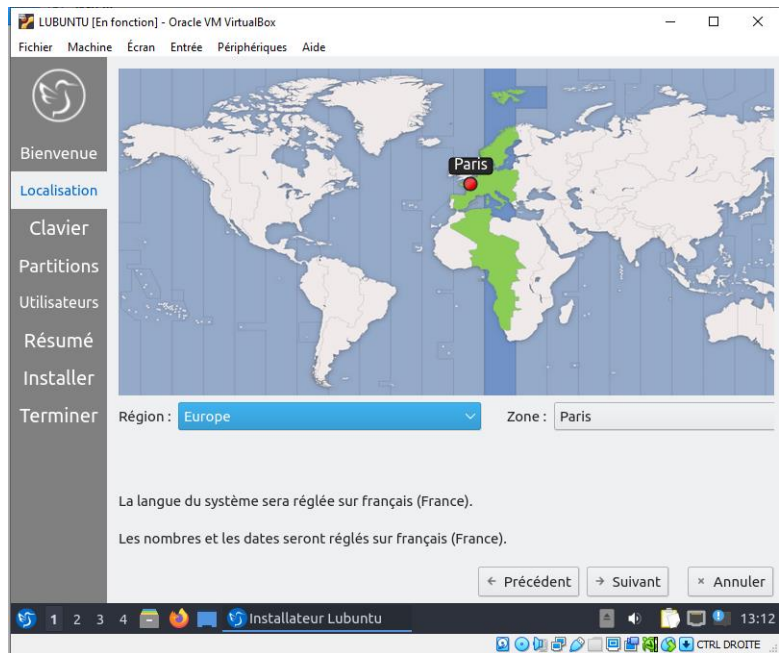
Installing LUBUNTU 20.04



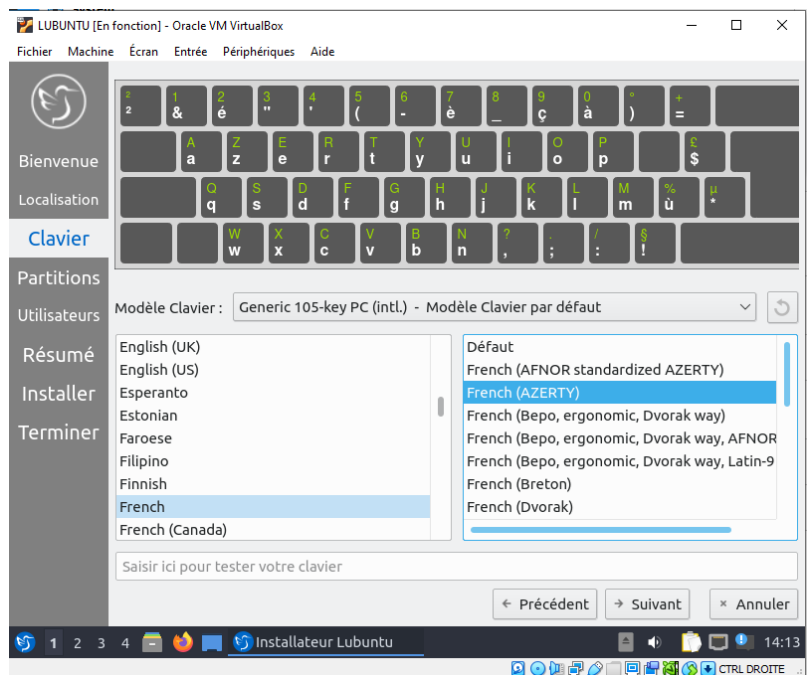
Choosing the language



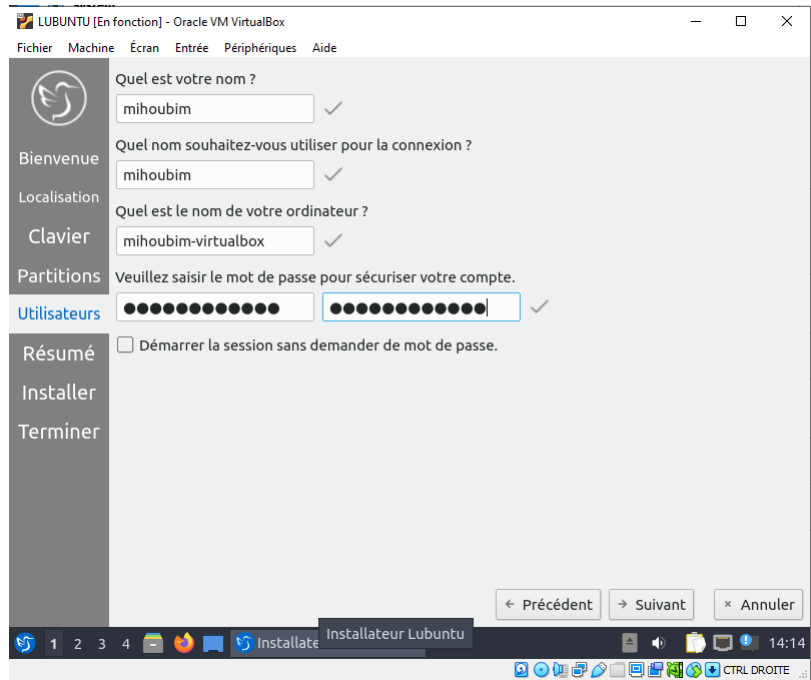
Choosing the location



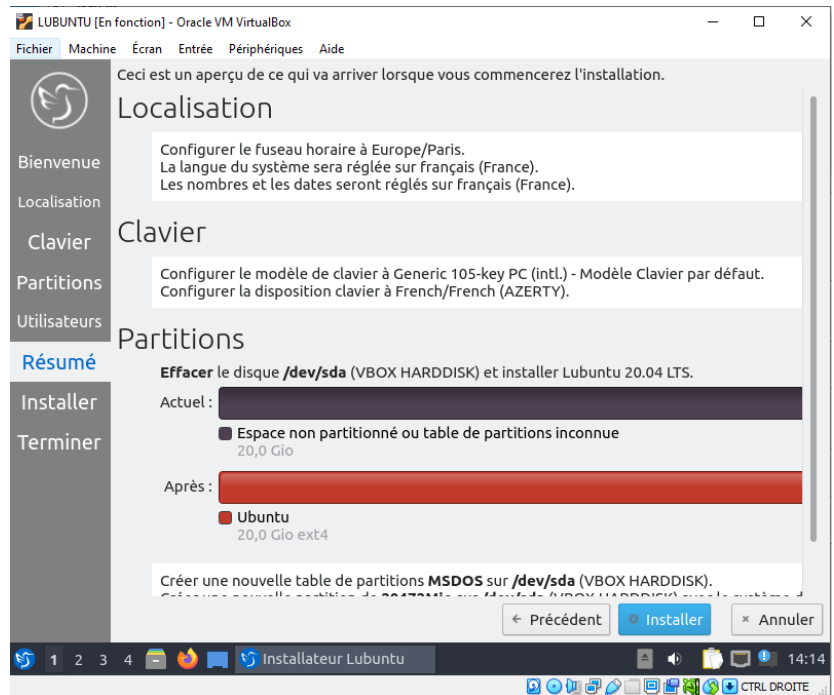
Selecting the keyboard



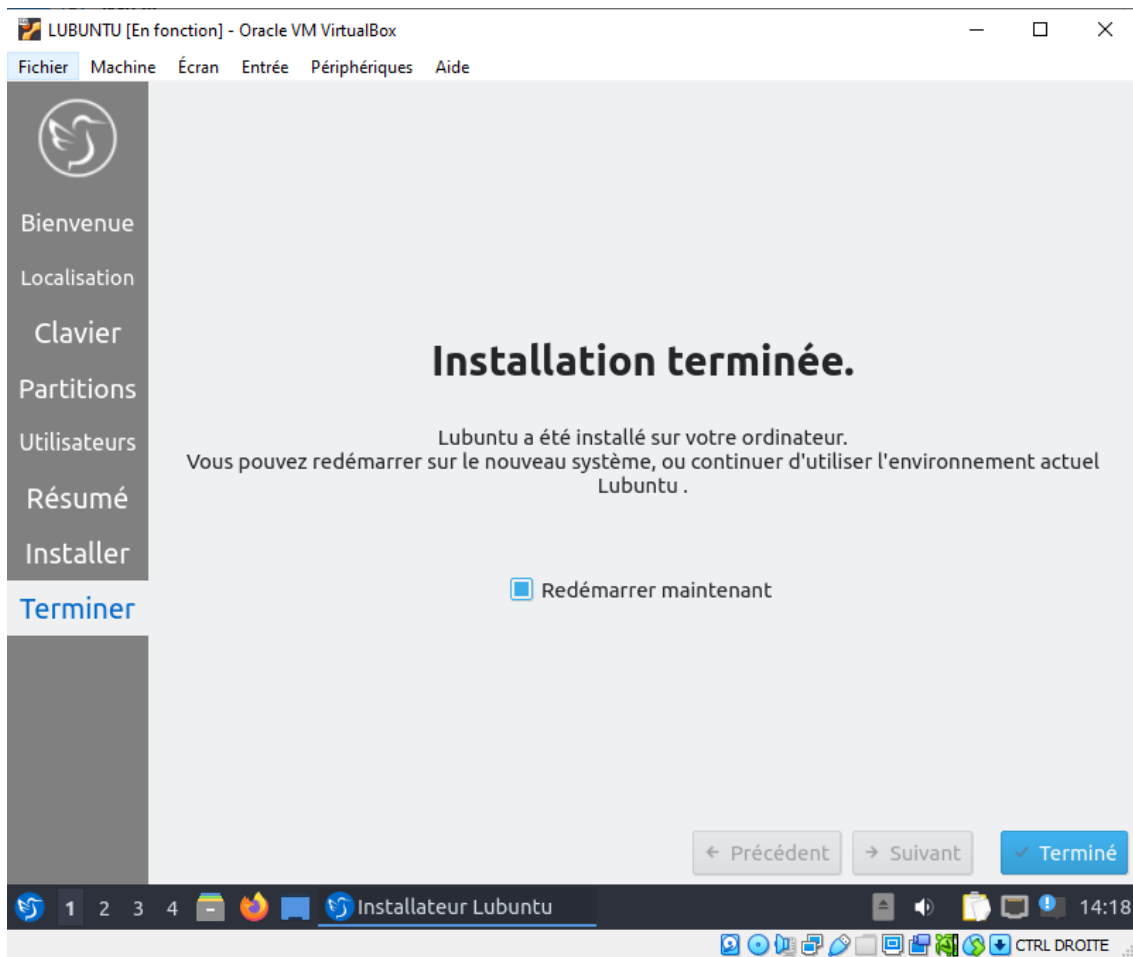
create a login, a server name and a password.



Finally install the OS



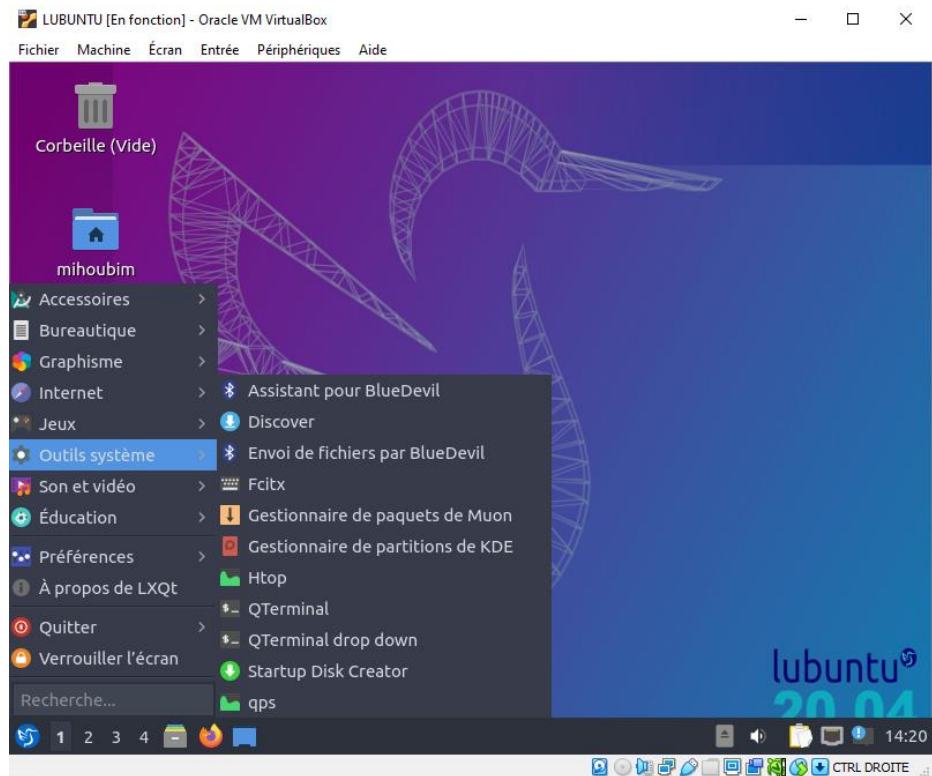
Installation completed !



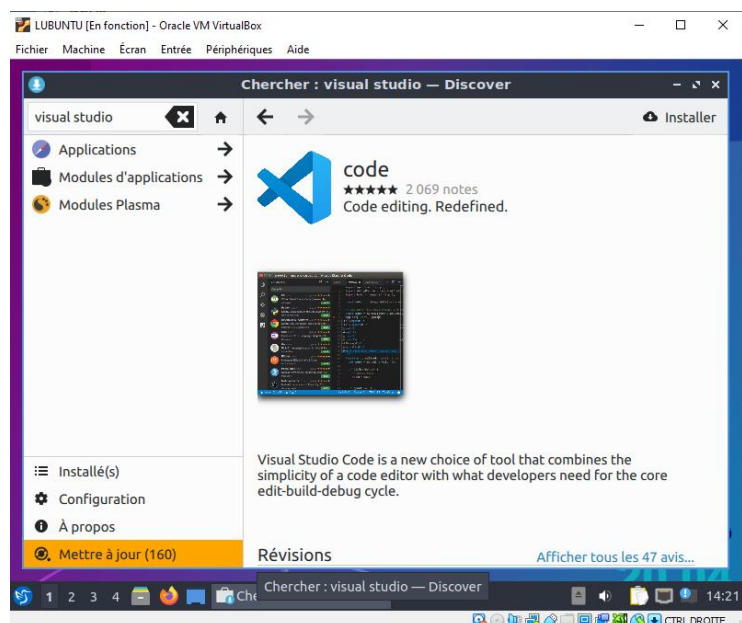
5. Installing a development environment

5.1. Installing Visual Studio Code

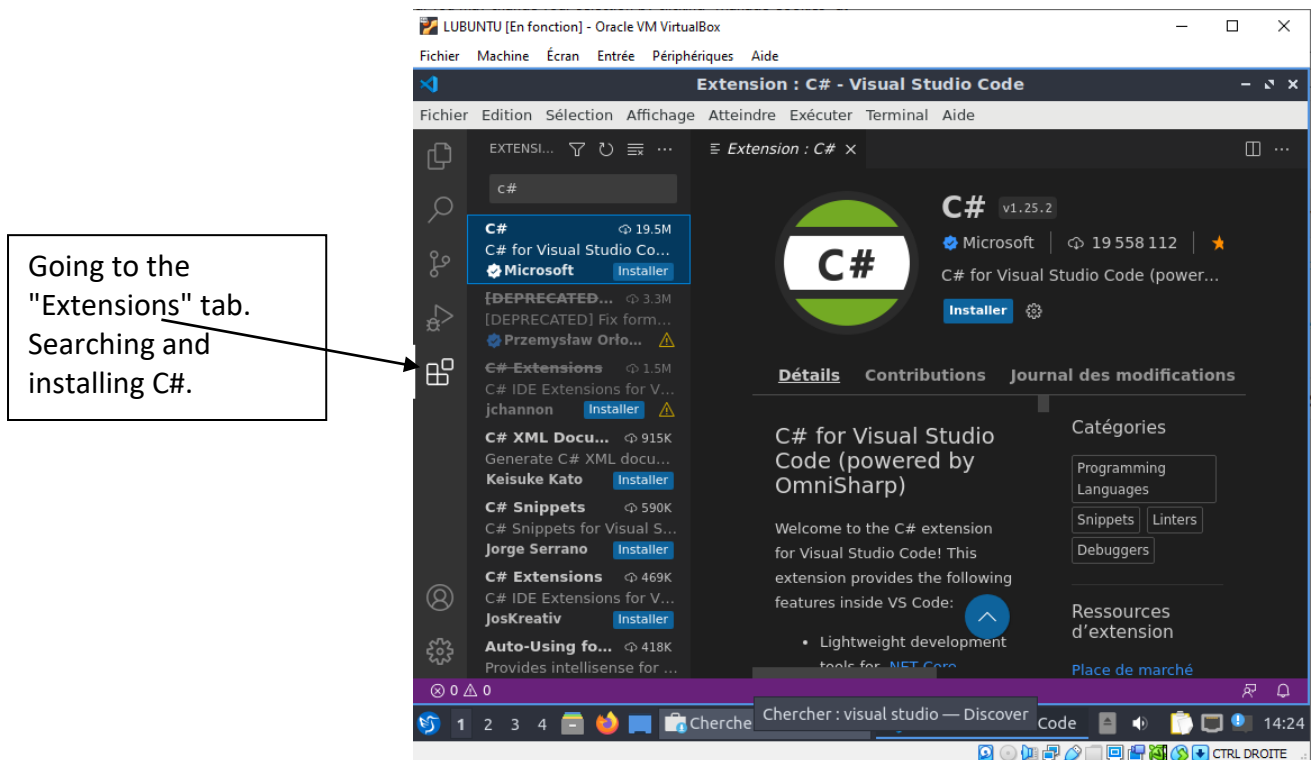
Opening Discover



Searching Visual Studio Code in the search bar and install the application. Enter your previously defined password if prompted.



5.2. Installing C# language and .NET



To continue, it is essential to install the .Net SDK and the .Net RUNTIME to have a functional programming environment.

Open a terminal and run the commands in the following order :

```
mihoubim@mihoubim-virtualbox:~$ wget https://packages.microsoft.com/config/ubuntu/20.04/packages-microsoft-prod.deb -O packages-microsoft-prod.deb
--2023-01-18 14:25:31-- https://packages.microsoft.com/config/ubuntu/20.04/packages-microsoft-prod.deb
Résolution de packages.microsoft.com (packages.microsoft.com)... 13.81.215.193
Connexion à packages.microsoft.com (packages.microsoft.com)|13.81.215.193|:443... connecté.
requête HTTP transmise, en attente de la réponse... 200 OK
Taille : 3690 (3,6K) [application/octet-stream]
Enregistre : «packages-microsoft-prod.deb»

packages-microsoft- 100%[=====>] 3,60K --.-KB/s ds 0s

2023-01-18 14:25:31 (1,55 GB/s) - «packages-microsoft-prod.deb» enregistré [3690/3690]
```

```
mihoubim@mihoubim-virtualbox:~$ sudo dpkg -i packages-microsoft-prod.deb
[sudo] Mot de passe de mihoubim : █
```

```
mihoubim@mihoubim-virtualbox:~$ sudo apt-get update && \
> sudo apt-get install -y aspnetcore-runtime-6.0
```

```
mihoubim@mihoubim-virtualbox:~$ sudo apt-get install -y dotnet-runtime-6.0
```


5.3 Installing SFML library

Opening a command terminal and doing this command. It will open VS Code.

code .

Running this command will create a solution file named "shmup".

```
mihoubim@mihoubim-virtualbox:~$ dotnet new console -n "shmup"
Le modèle « Application console » a bien été créé.

Traitement des actions postérieures à la création en cours..
. Merci de patienter.
```

adding a file named "shmup.csproj" to the solution.

```
mihoubim@mihoubim-virtualbox:~$ dotnet new sln -n "shmup"

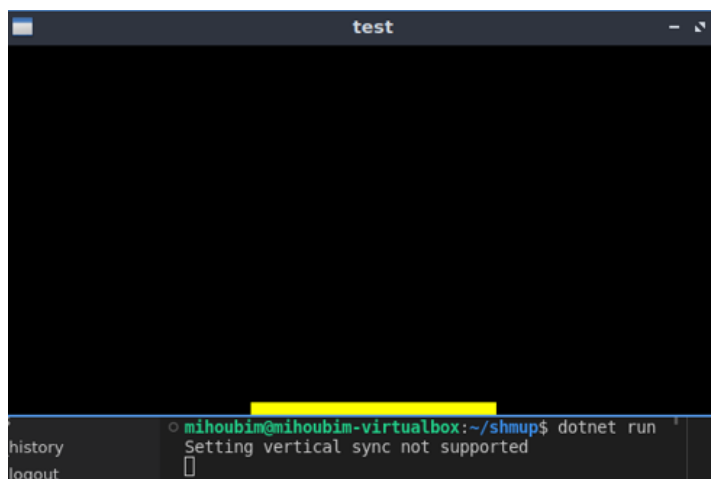
Bienvenue dans .NET 6.0 !
-----
Microsoft .NET SDK 6.0.405
```

Going to VS Code, open a terminal and execute this command and enter the password:

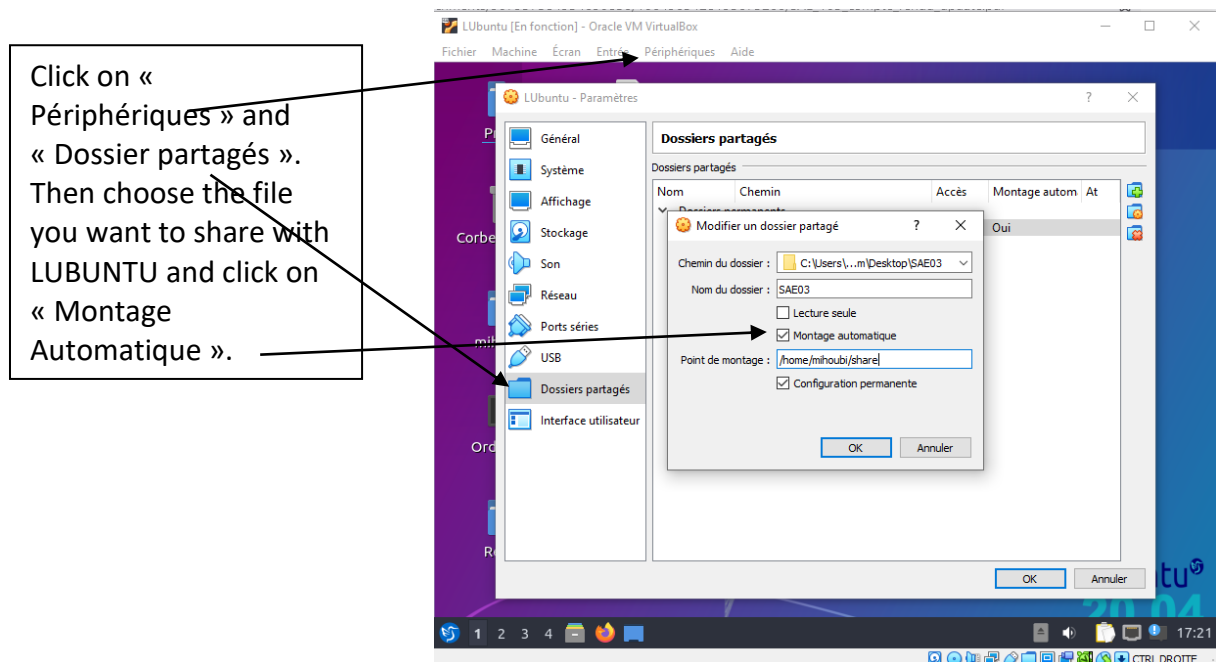
It installs the SFML library.

```
mihoubim@mihoubim-virtualbox:~$ sudo apt-get install libsfml-dev
[sudo] Mot de passe de mihoubim :
```

Executing the SFML program that creates a yellow rectangle and is in the "shmup" solution. Execute the **dotnet** run command to launch the program



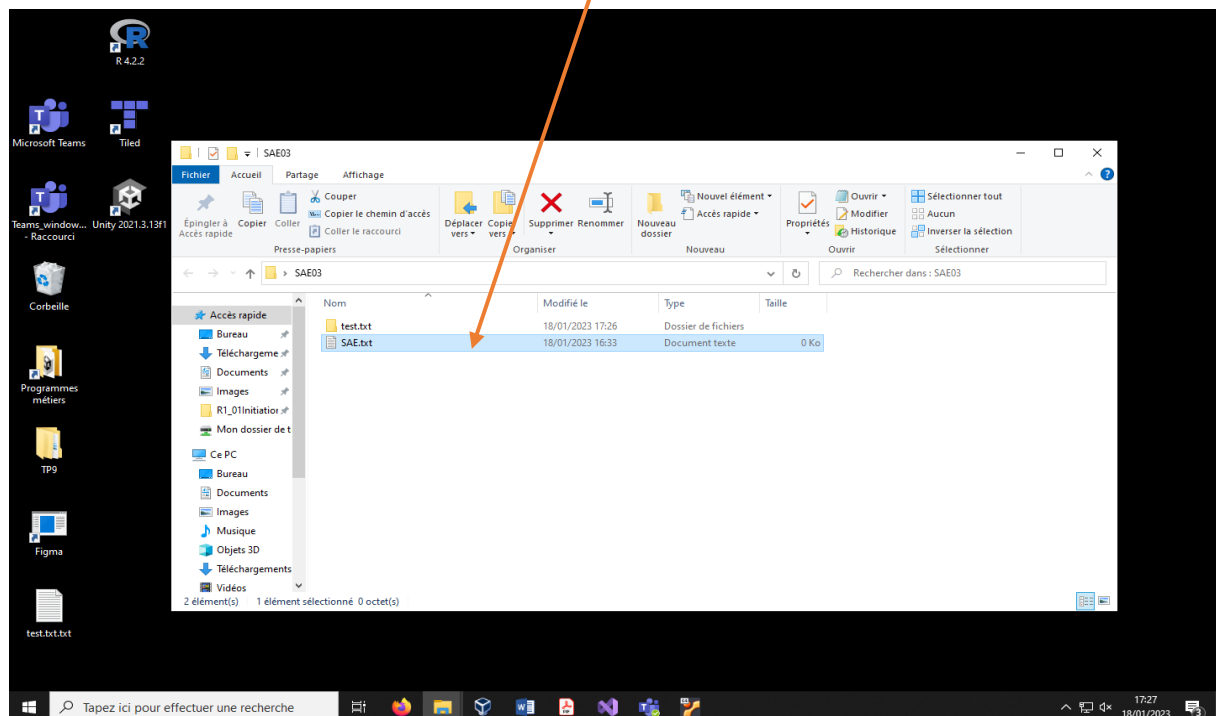
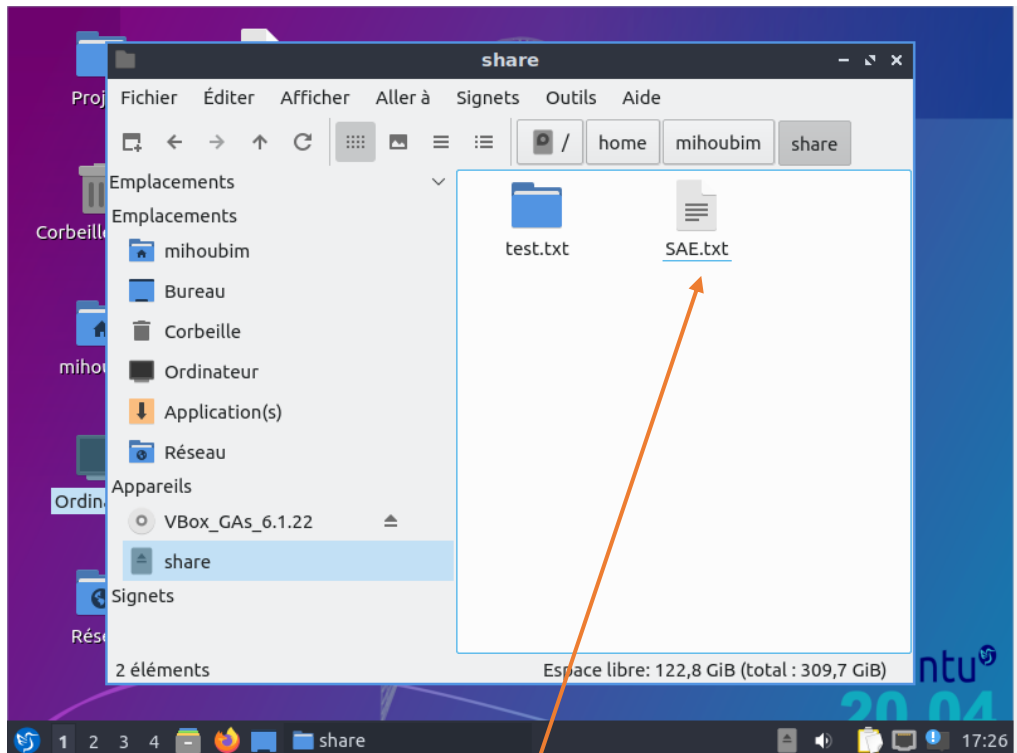
6. Configuring file sharing



Open a terminal and run the following commands:

```
mihoubim@mihoubim-virtualbox:~$ sudo mount -t vboxsf SAE03 ~/share
[sudo] Mot de passe de mihoubim :
mount: /home/mihoubim/share: le point de montage n'existe pas.
mihoubim@mihoubim-virtualbox:~$ mkdir share
mihoubim@mihoubim-virtualbox:~$ sudo mount -t vboxsf SAE03 ~/share
mihoubim@mihoubim-virtualbox:~$
```

The folder sharing works, we can see that windows shares the SAE.txt file with LUBUNTU!



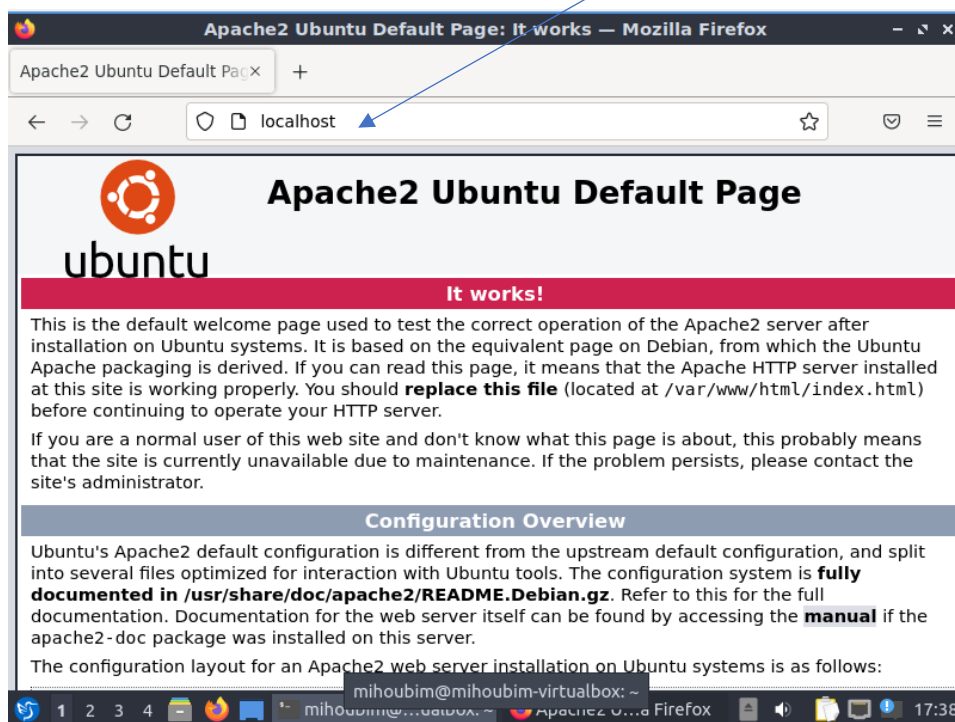
7. Installing Apache server

Open a terminal and run the following commands:

```
mihoubim@mihoubim-virtualbox:~$ sudo systemctl start apache2
mihoubim@mihoubim-virtualbox:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pre
   Active: active (running) since Wed 2023-01-18 17:34:38 CET; 1min 47s ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 37865 (apache2)
      Tasks: 55 (limit: 2217)
     Memory: 4.7M
    CGroup: /system.slice/apache2.service
            └─37865 /usr/sbin/apache2 -k start
              └─37868 /usr/sbin/apache2 -k start
                └─37869 /usr/sbin/apache2 -k start

janv. 18 17:34:38 mihoubim-virtualbox systemd[1]: Starting The Apache HTTP S>
janv. 18 17:34:38 mihoubim-virtualbox apache2[37864]: AH00558: apache2: Co>
janv. 18 17:34:38 mihoubim-virtualbox systemd[1]: Started The Apache HTTP Se>
lines 1-15/15 (END)
```

Apache server is installed, to check you must write localhost on a browser.



8. Installing PHP

To install PHP, execute the command below: **\$ sudo apt-get install php**

Then to check that you have correctly installed PHP, execute the command below:
Here the version installed is the version of PHP 7.4.3

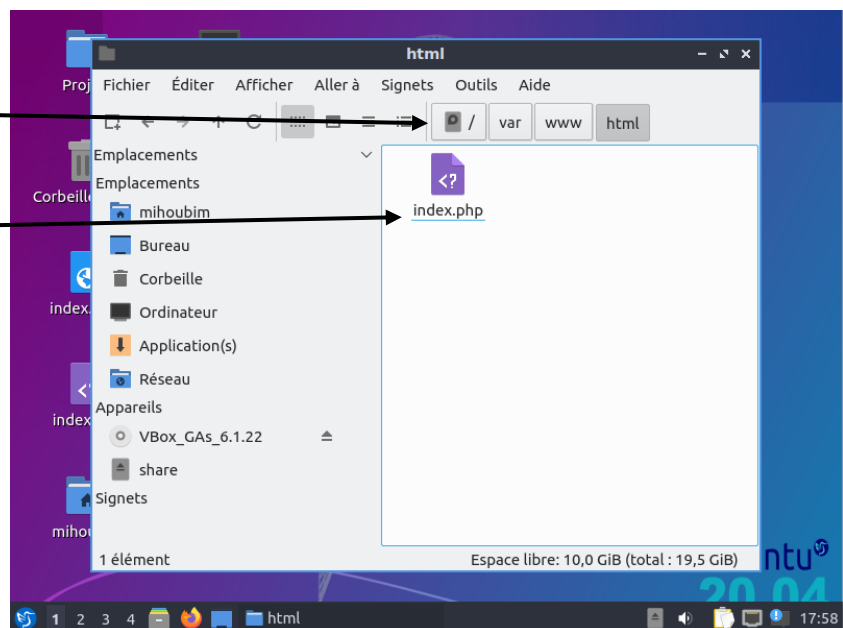
```
mihoubin@mihoubin-virtualbox:~$ php --version
PHP 7.4.3-4ubuntu2.16 (cli) (built: Sep 15 2022 22:53:21) ( NTS )
Copyright (c) The PHP Group
Zend Engine v3.4.0, Copyright (c) Zend Technologies
with Zend OPcache v7.4.3-4ubuntu2.16, Copyright (c), by Zend Technologies
```

Open the file explorer and follow the path.

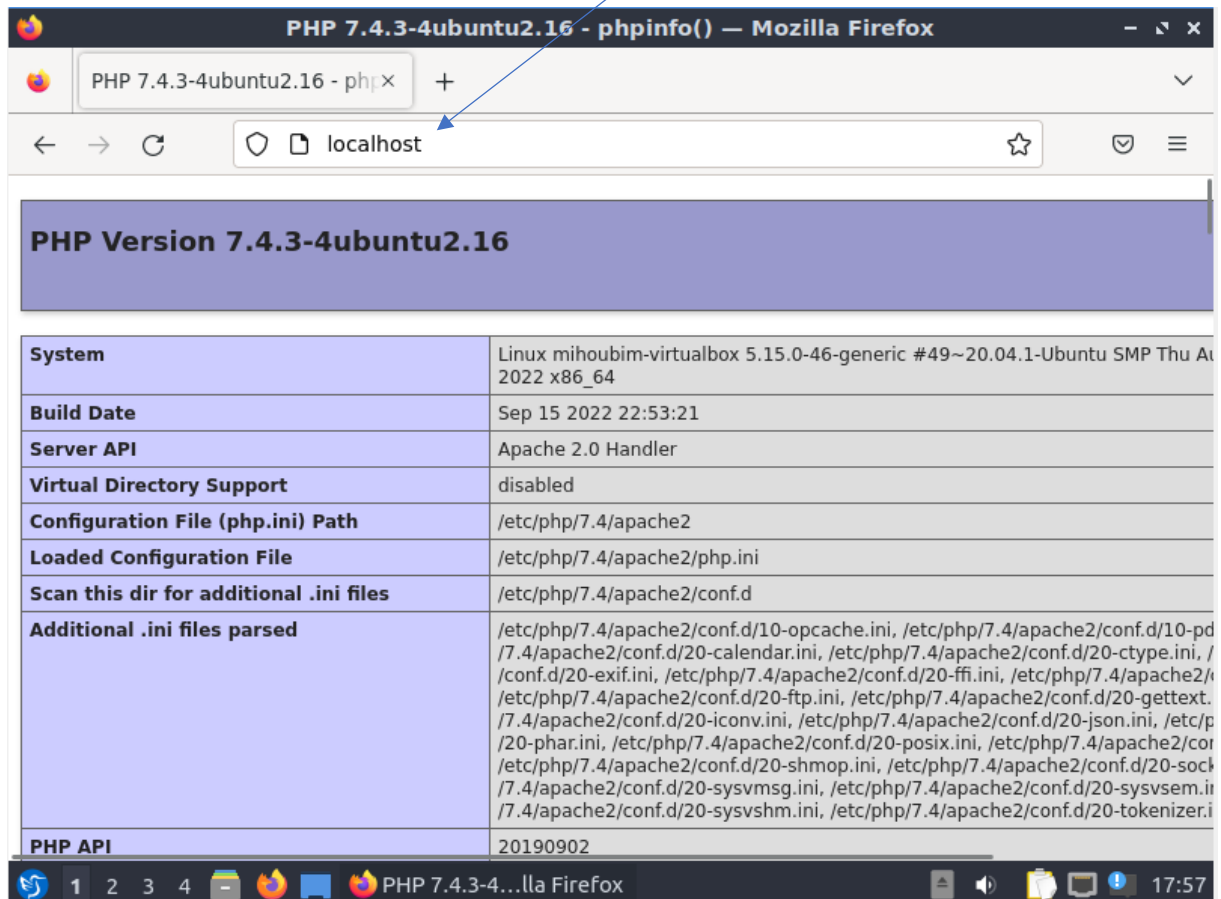
Replace the file index.html with index.php.

Open this file and enter this:

```
<?php
?>
```



PHP is installed, to check you must write localhost on a browser.

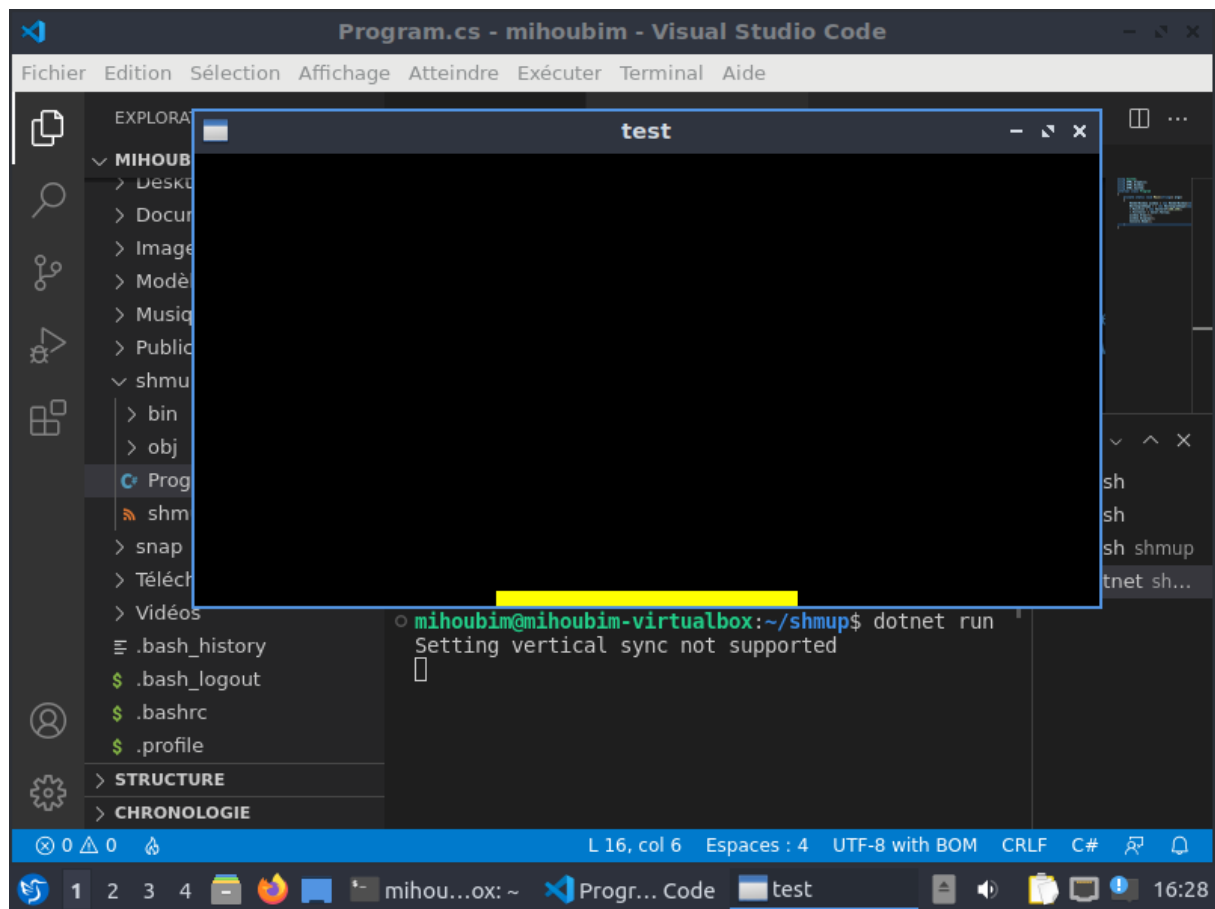


The screenshot shows a Mozilla Firefox browser window with the title "PHP 7.4.3-4ubuntu2.16 - phpinfo() — Mozilla Firefox". The address bar contains "localhost". The page displays the PHP version "7.4.3-4ubuntu2.16" and a table of system and configuration details.

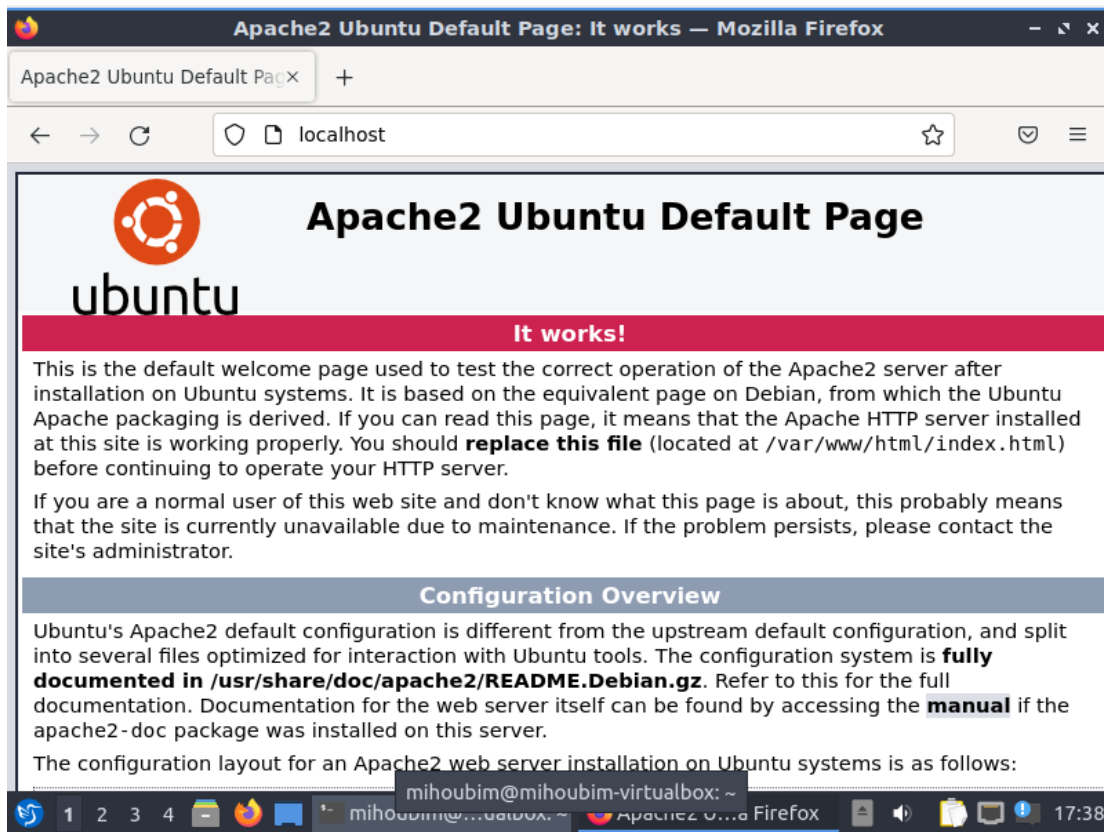
System	Linux mihoubim-virtualbox 5.15.0-46-generic #49~20.04.1-Ubuntu SMP Thu Aug 11 2022 x86_64
Build Date	Sep 15 2022 22:53:21
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.4/apache2
Loaded Configuration File	/etc/php/7.4/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.4/apache2/conf.d
Additional .ini files parsed	/etc/php/7.4/apache2/conf.d/10-opcache.ini, /etc/php/7.4/apache2/conf.d/10-pd.ini, /etc/php/7.4/apache2/conf.d/20-calendar.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-exif.ini, /etc/php/7.4/apache2/conf.d/20-ffi.ini, /etc/php/7.4/apache2/conf.d/20-fileinfo.ini, /etc/php/7.4/apache2/conf.d/20-ftp.ini, /etc/php/7.4/apache2/conf.d/20-gettext.ini, /etc/php/7.4/apache2/conf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-json.ini, /etc/php/7.4/apache2/conf.d/20-mbstring.ini, /etc/php/7.4/apache2/conf.d/20-phar.ini, /etc/php/7.4/apache2/conf.d/20-posix.ini, /etc/php/7.4/apache2/conf.d/20-shmop.ini, /etc/php/7.4/apache2/conf.d/20-sockets.ini, /etc/php/7.4/apache2/conf.d/20-sysvmsg.ini, /etc/php/7.4/apache2/conf.d/20-sysvsem.ini, /etc/php/7.4/apache2/conf.d/20-sysvshm.ini, /etc/php/7.4/apache2/conf.d/20-tokenizer.ini
PHP API	20190902

9. Testing

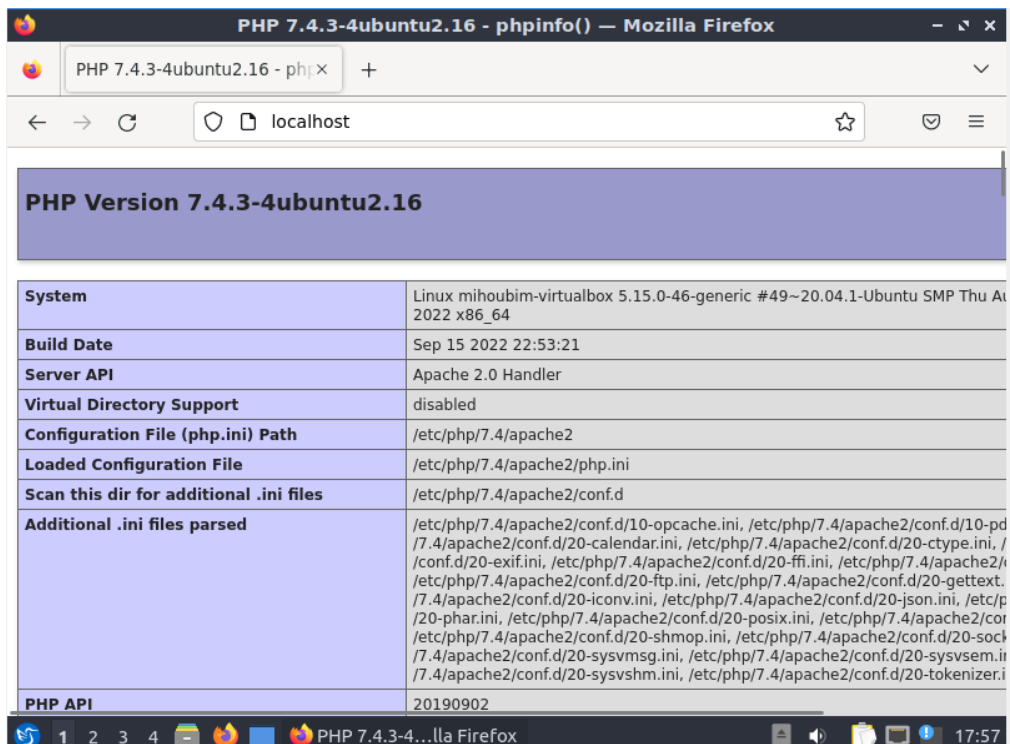
9.1. - SFML program drawing a rectangle



9.2. – Verification of the presence of the Apache server



9.3. -Verification of the presence of PHP



10. Complementary

more help here:

.Net SDK installation	Install .NET on Ubuntu - .NET Microsoft Learn
SFML installation	Setup Project with C# .NET Core, SFML, and Visual Studio Code let's develop games (letsdevelopgames.com)