Environment Setup Guide

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In HW4, you will use SimpleScalar simulator and SPEC2000 benchmark suite to simulate computing systems and evaluate their performance. The simulator itself is portable to most platforms but to control and minimize unexpected issues, we recommend you to use the provided virtual machine (VM) image which has pre-installed Ubuntu 14.04 operating system and necessary files for the simulator and the benchmark suite.

But **if you prefer and are comfortable with dealing with issues on your own environment**, you can just use the archive file (simplesim-3.0.tar) uploaded on KLMS which contains SimpleScalar and SPEC2000 files. In this case, skip this guide and just *extract the archive file to a directory where you can access with a terminal*. Note that this is simply an archive of the 'simplesim-3.0' directory within the VM image.
You may also need to resolve some dependencies if they are not installed. There should be no issue with building and running SimpleScalar with the content of the archive file on most Linux/Unix environment with GNU tools installed (**particularly, 'gcc' and 'make'**), *but there may be exceptions*. (We have tested several Ubuntu & GCC versions but have not found any issues yet.)
* It seems there are several issues with running the simulations directly on MAC environment.

This guideline is based on *Windows 11 (x86-64)* and *VirtualBox 7.0.0.* The provided VM image is confirmed to work with *VirtualBox 7.0.0* on *x86-64* system running *Windows 10/11*. (*VirtualBox* has recently been updated to *7.0.2*, but there should be no problems with the latest version as well.) It should work on other OS or may be even on non-x86-64 systems as long as *VirtualBox* supports the system and VM feature is enabled on the system. If you face with unexpected issues (probably due to the difference of specific system configurations) that you can't handle by yourself, please contact TA via the KLMS Q&A board.

If you are using other OS, non-x86-64 system, or not using the provided VM image, you may face with different issues (not very likely though). In such case, we could give you advices but please understand that it could be limited since we cannot have access to all possible variations of system environments.

I. Download VM image.

Follow the Google Drive link and download the VM image file

https://drive.google.com/file/d/146_-gtRuC6l_0VNRn2n2yckhDxeJ7OC3

<CS311_Ubuntu14.04_Alpha_SPEC2000.ova>.
Since the file is quite large (about 1.5GB) you may need to check sufficient storage space.

II. Download 'VirtualBox'.

In this project, you will use 'VirtualBox' as a hypervisor for running the VM image. Since it is a free software, you can easily download from the website.

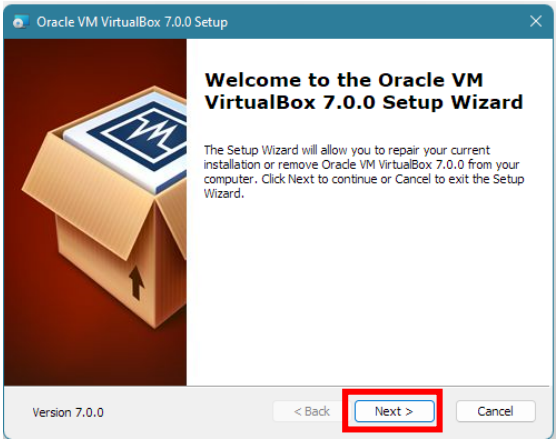
https://www.virtualbox.org/wiki/Downloads

You will see the web page as follows. According to your computer's operating system, click an appropriate package. It will directly download an installation package.

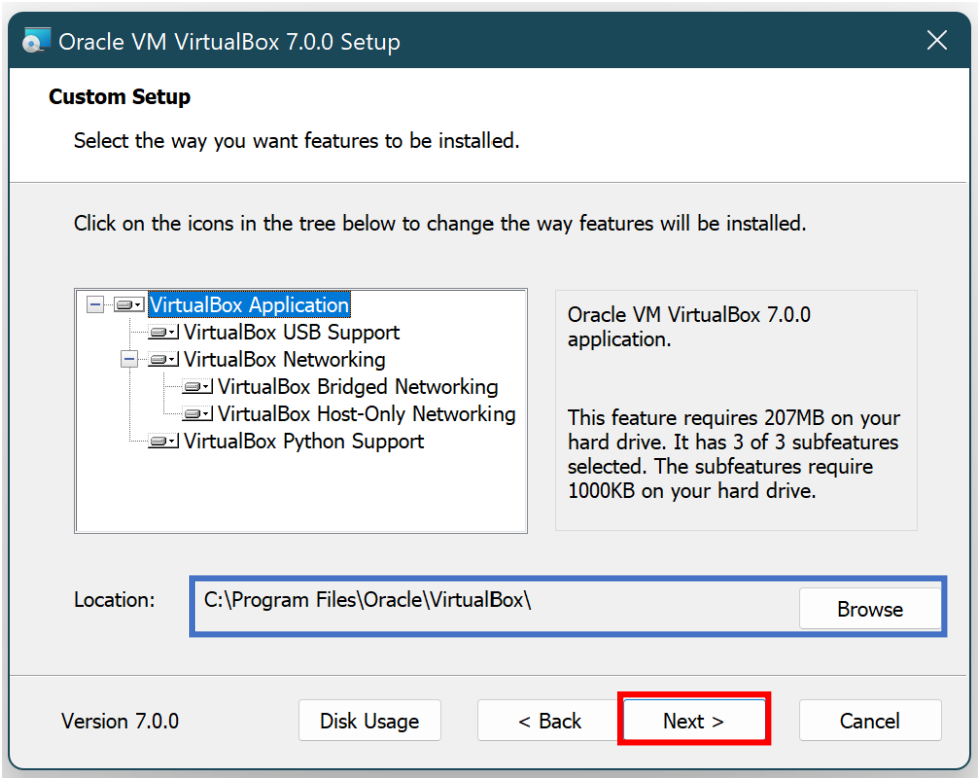
III. Install 'VirtualBox'.

After downloading 'VirtualBox' installation package, execute it. Basically, you just need to follow the instructions on the VirtualBox Setup Wizard. Following is a step-by-step guide.

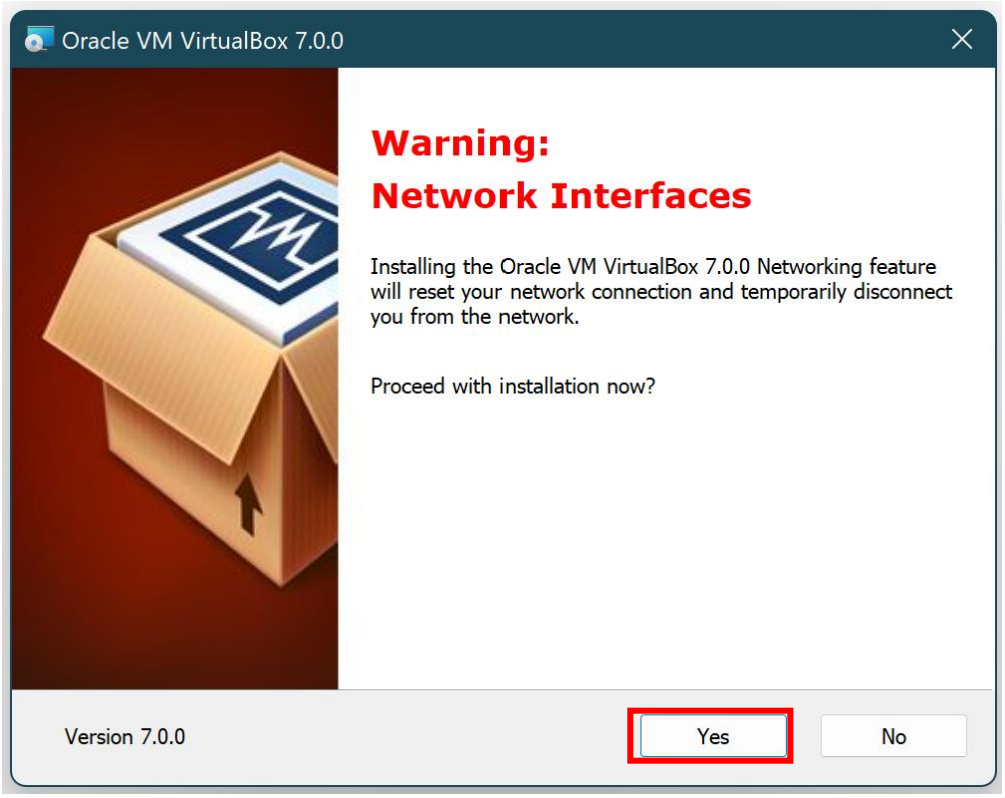
Click 'Next'



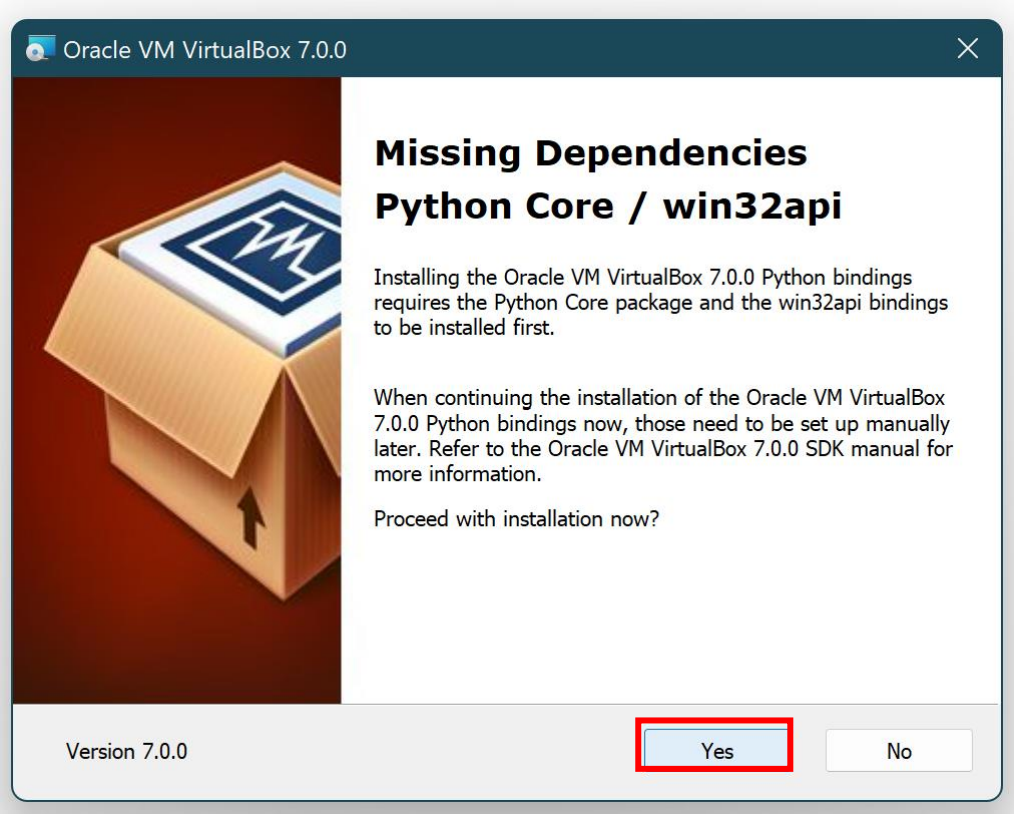
Change the install location if you want. Click ‘Next’.



Ensure temporal network disconnection will not cause any problem on your system. Then click ‘Yes’,

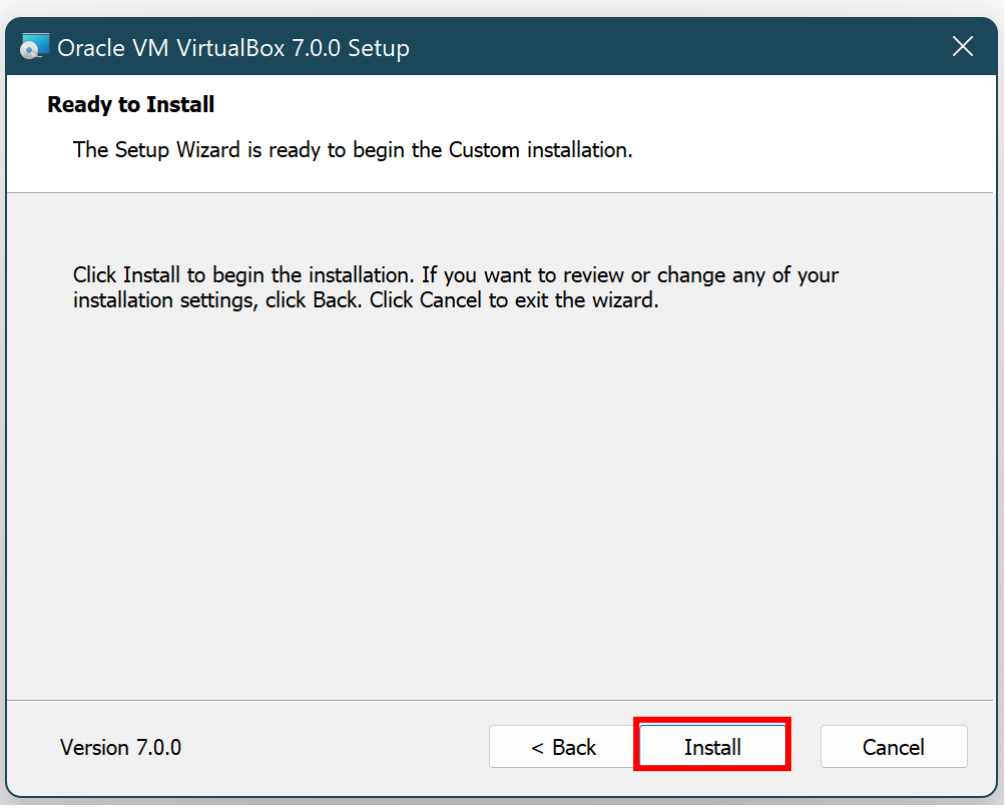


Click ‘Yes’,



Click ‘Install’. This will take some time.

※ This may ask authorization. Then, click ‘Yes’.

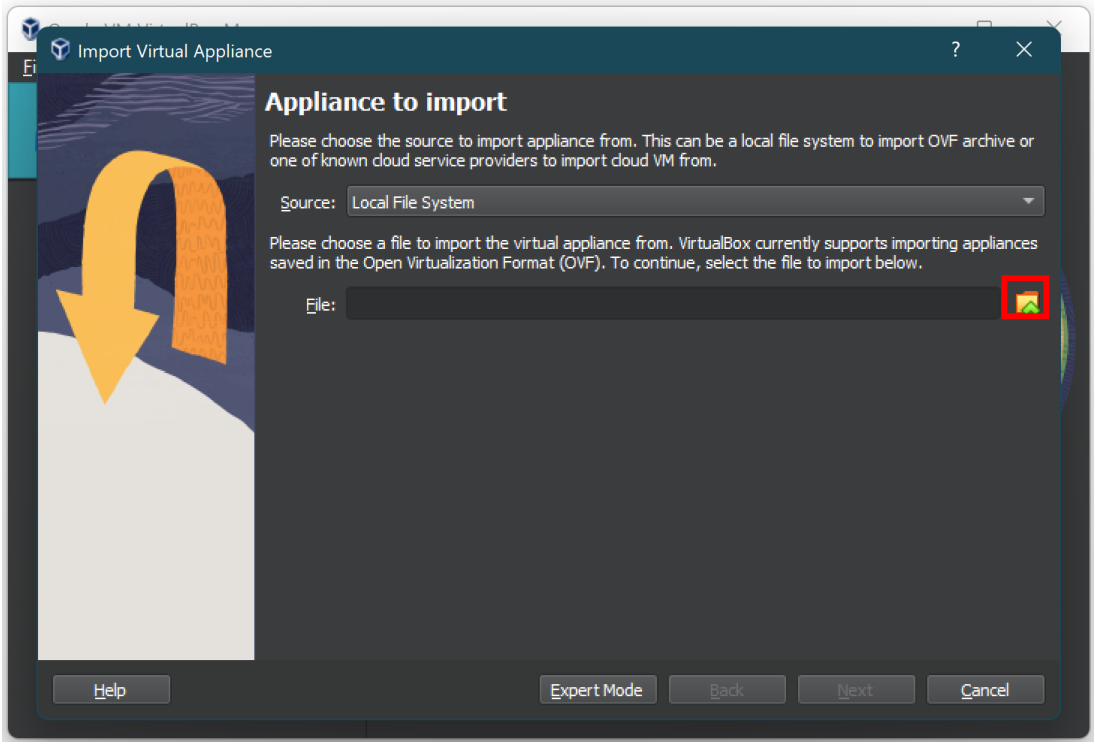


Click ‘Finish’ to complete the installation and start ‘VirtualBox’.

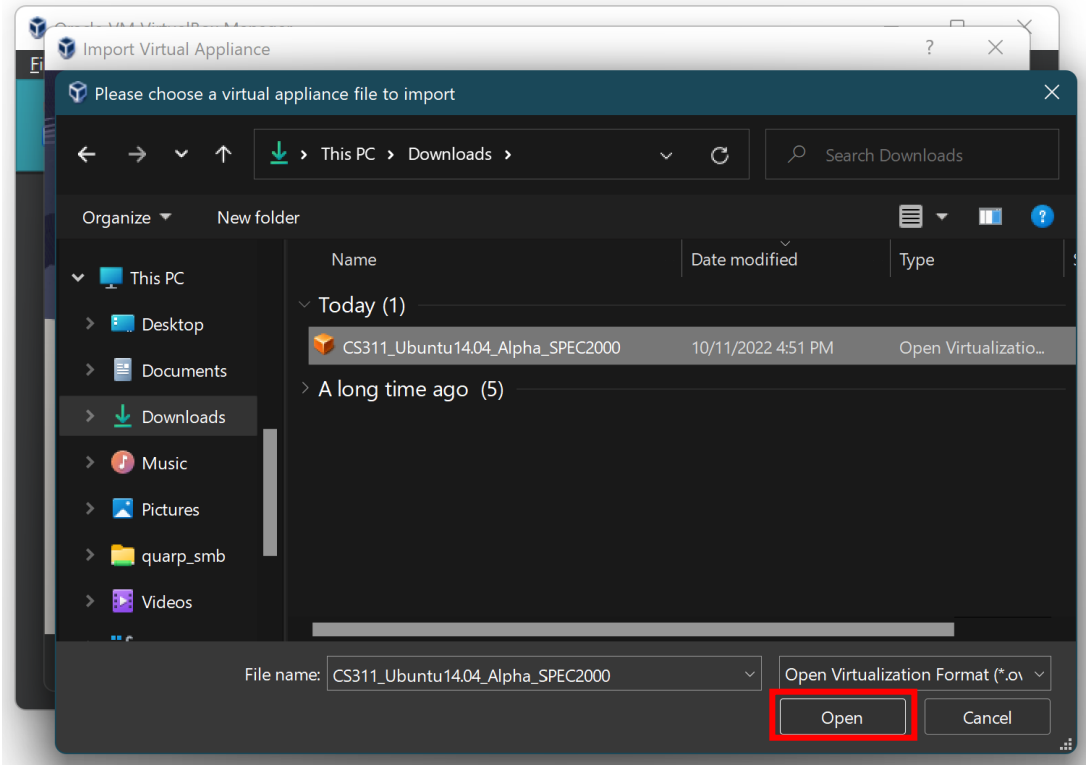
IV. Import VM image into ‘VirtualBox’

When you start ‘VirtualBox’, you will see ‘VirtualBox’ manager window.
Click the ‘Import’ icon to import a VM image

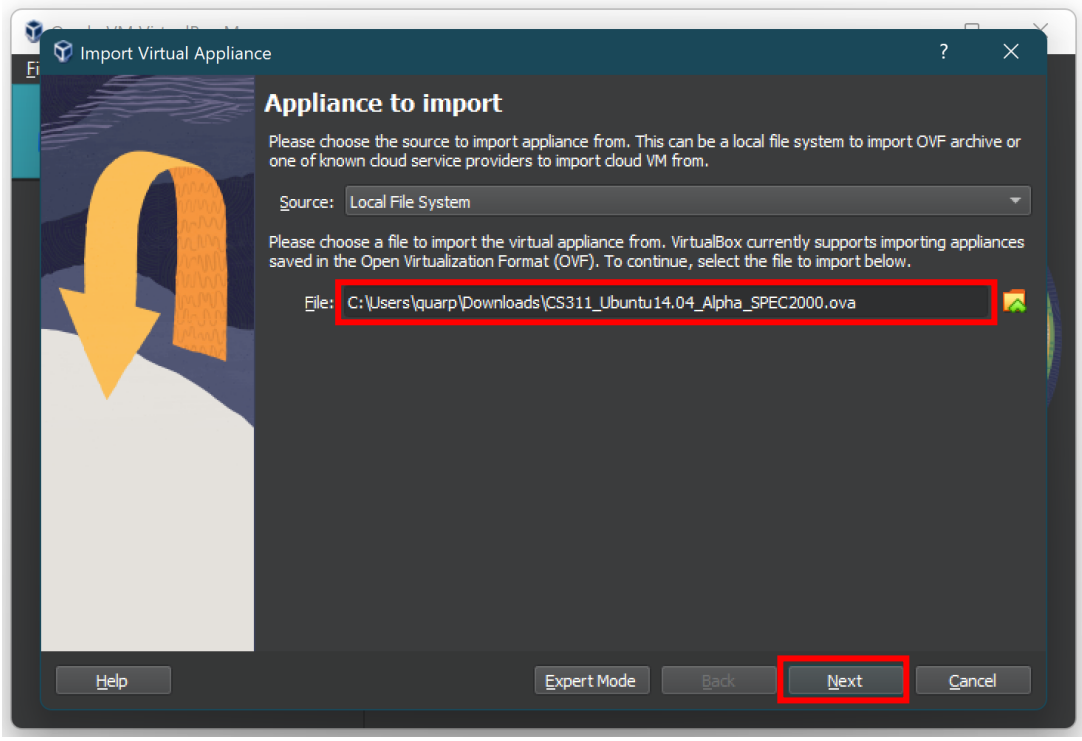
Click folder-shaped icon to locate the VM image downloaded earlier.



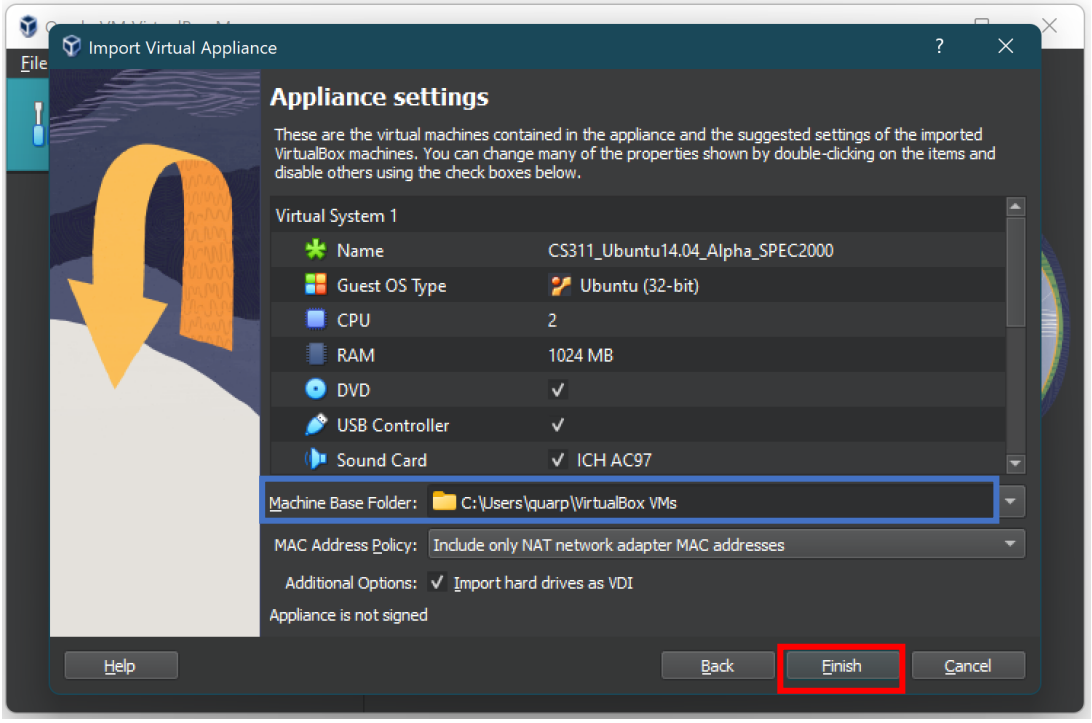
Go to the directory where you downloaded the VM image.
Then select the VM image file <CS311_Ubuntu14.04_Alpha_SPEC2000.ova> and click 'Open'.



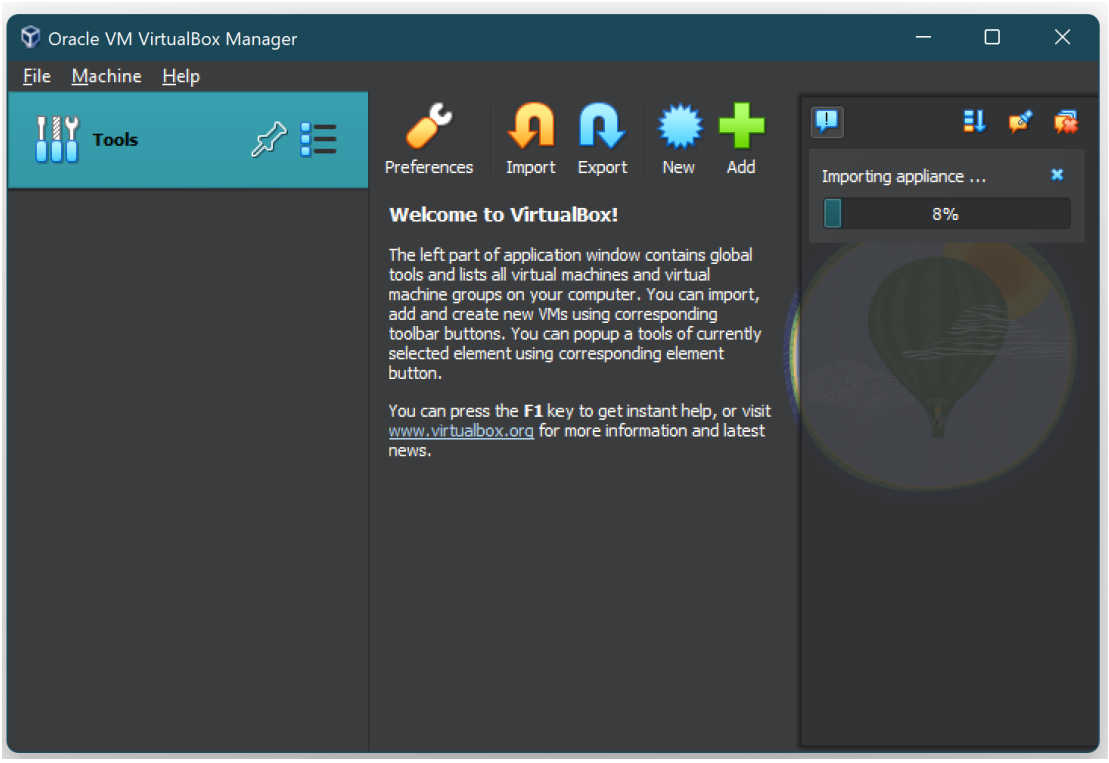
Check if the path is correct and click ‘Next’.



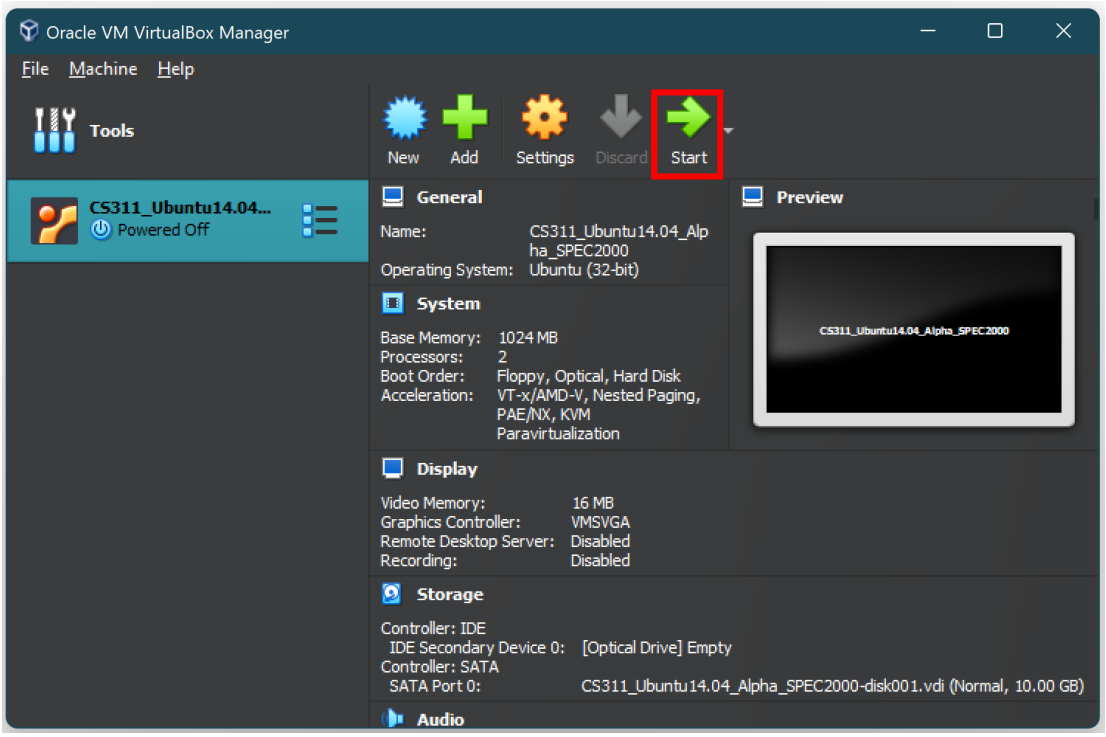
Change Machine Base Folder (where VM files will be maintained in your system; this requires ~5GB space) if you need to. Click ‘Finish’ to start importing.



Importing will take some time.

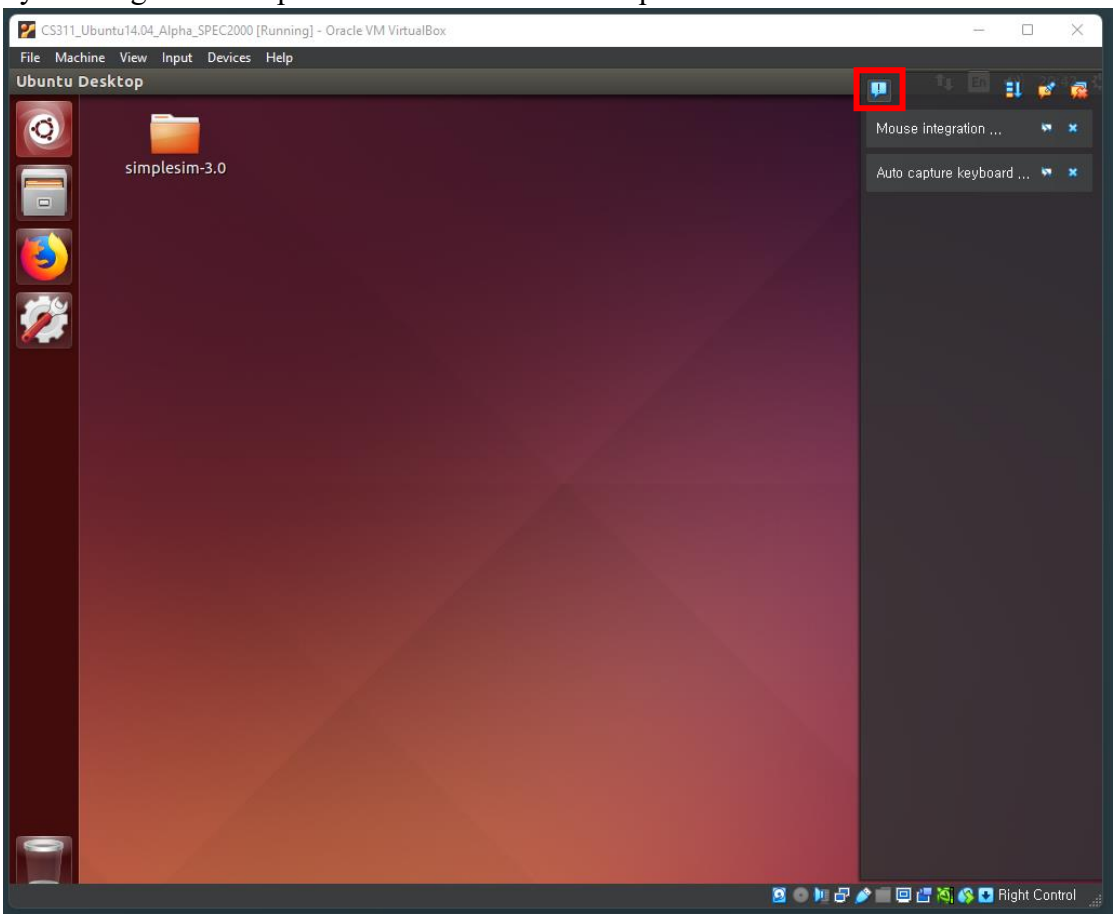


If importing completes, you will see information of the VM image you imported. Click 'Start' to start up the virtual machine.



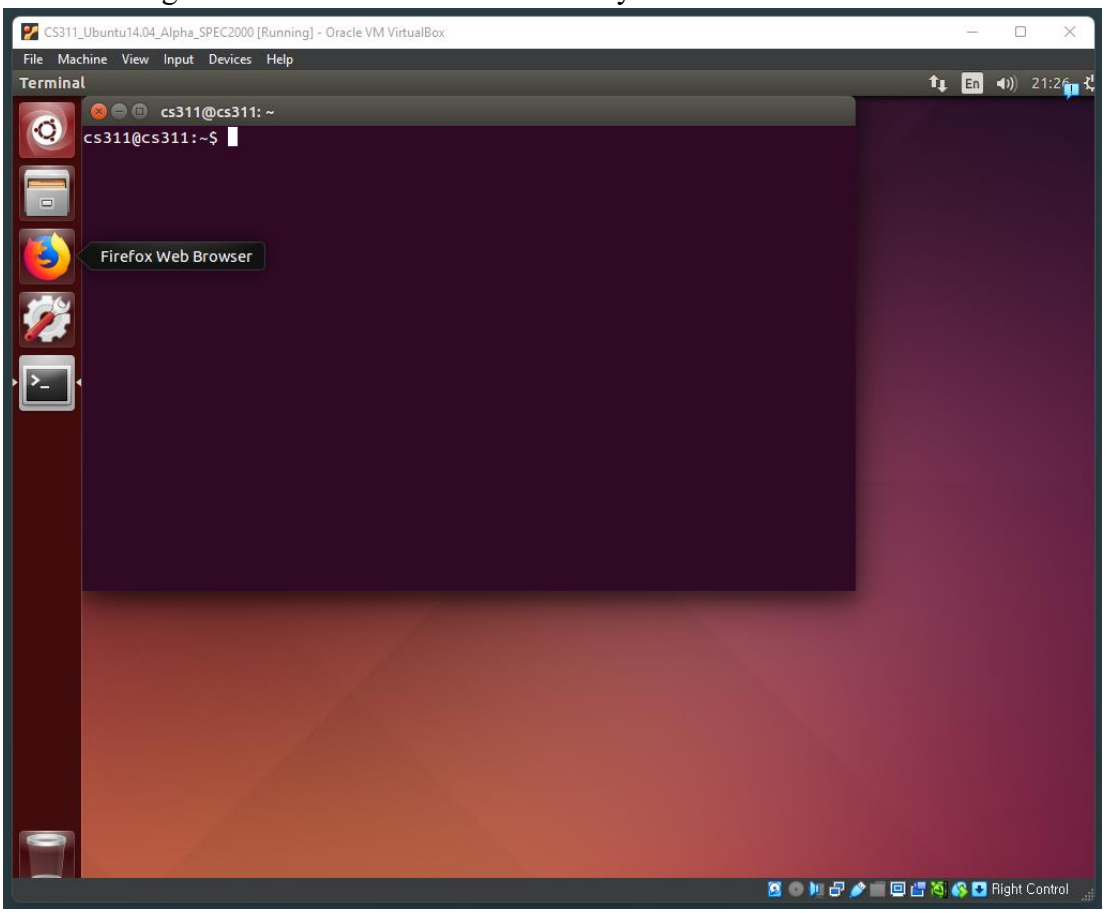
※(I found there is a conflict issue on Virtual box related to Hyper-V on Windows 10. If conflict happens, you may not be able to start Linux image at this step. If you experience this kind of error and cannot solve it by yourself, please contact to TA.)

A new window will be shown. Please wait until booting on VM completes and displaying main screen as follows. You can hide the notification center of VirtualBox by clicking the blue speech balloon icon on the top left of the notification center.



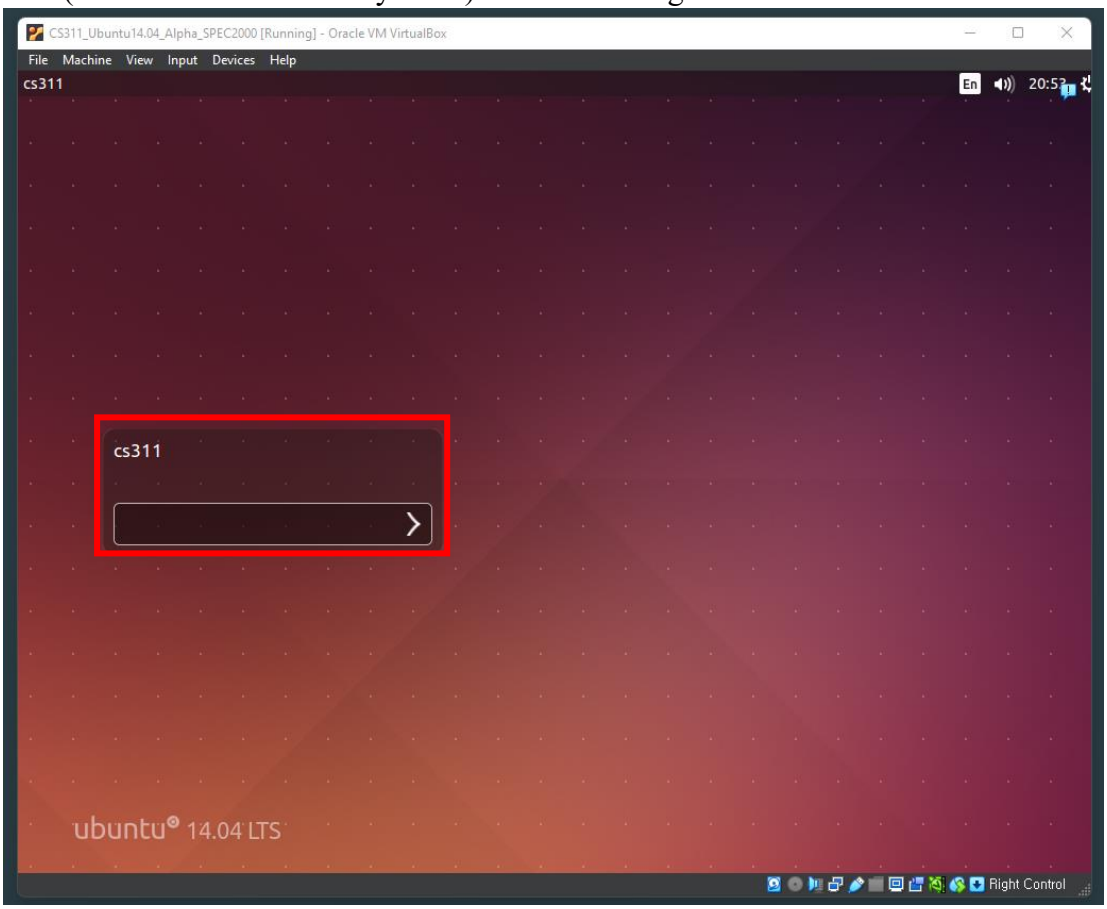
Launch a terminal

Press ‘Ctrl’ + ‘Alt’ + ‘t’ to launch a new terminal. It will open a new window displaying a line starting with ‘cs311’. This is the terminal you need for HW4.



*** Log-in from suspend state.**

If you do not do anything for a while, Ubuntu can automatically switch to suspend state. In suspend state, there could be nothing but black screen. If you interact with the VM (either with mouse or keyboard) it will show log-in screen as follows.



Note that the password is <cs311> which is identical to the account name. Type the password and press 'Enter'. Then, it will come back to Linux main screen.

You will need this password if you do anything that requires privilege within this Ubuntu VM.

*** Terminate VM**

Close the window to terminate a VirtualBox VM. Select an option you want then click 'OK' to close the VM.