

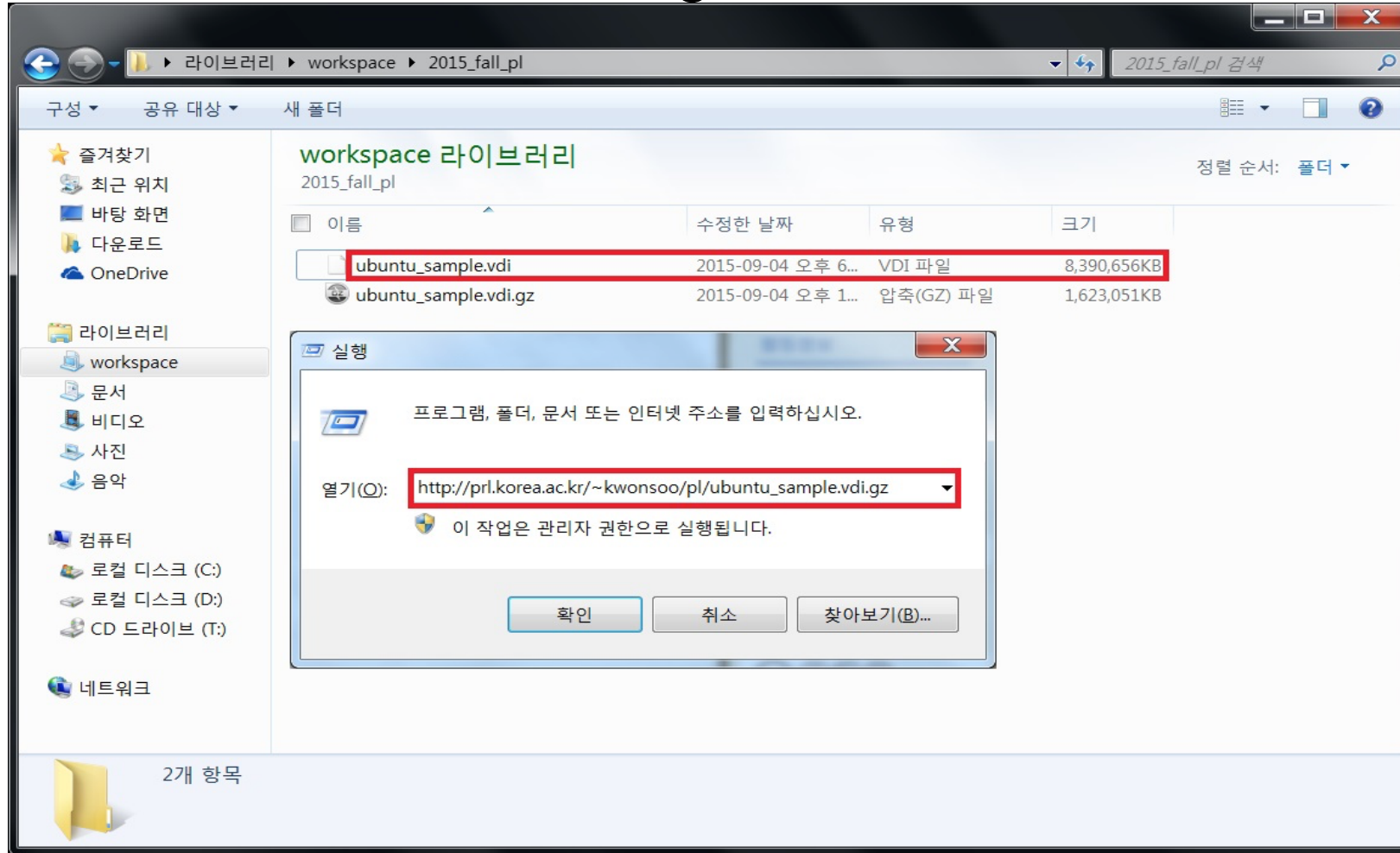
Installation of OCaml Programming Environment

Programming Research Laboratory, Korea University

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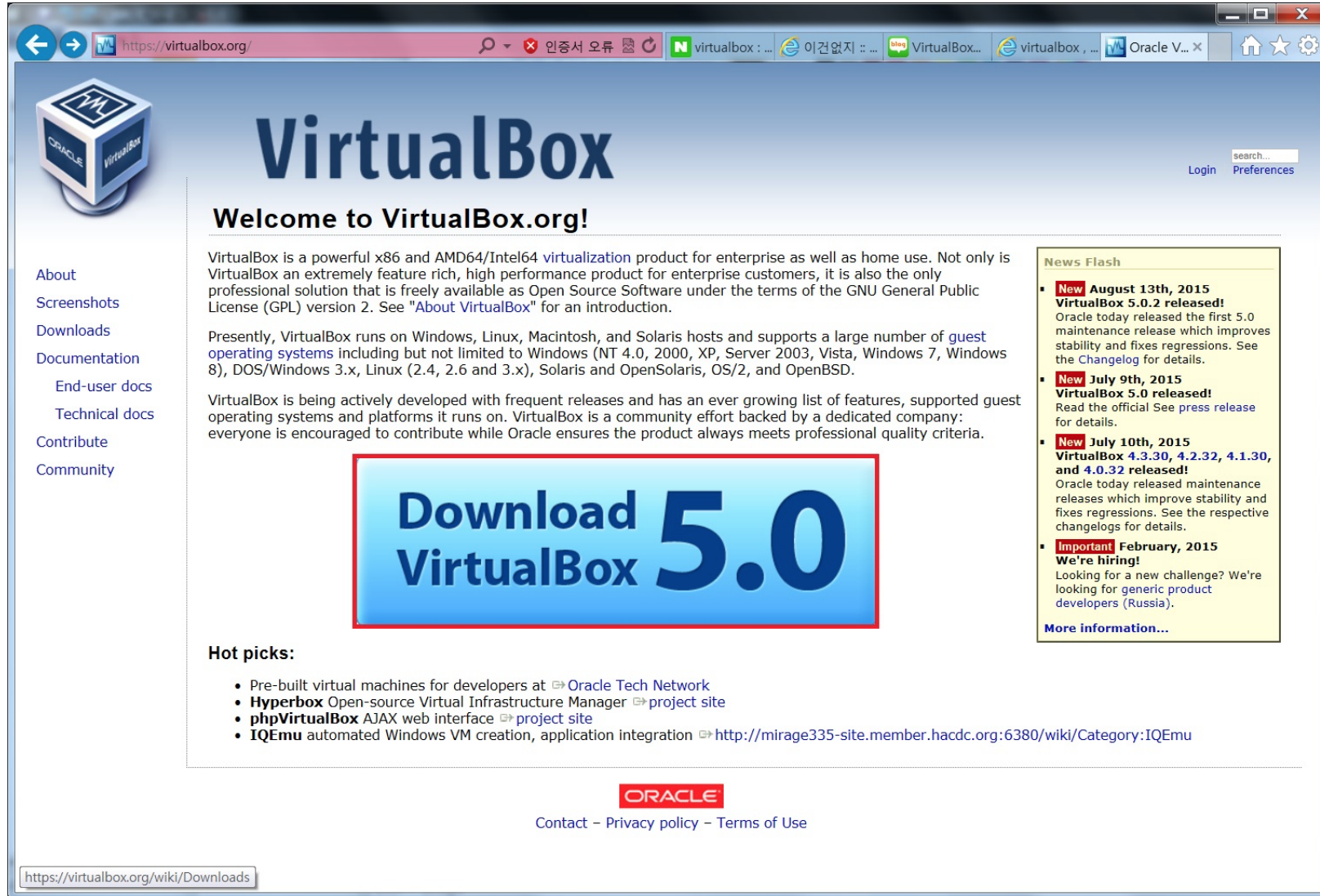
1. Download the VirtualBox image file



Download the image file from the address below and unpack it:

http://prl.korea.ac.kr/~kwonsoo/pl/ubuntu_sample.vdi.gz

2. Install VirtualBox



The screenshot shows the VirtualBox.org website in a browser window. The main heading is "VirtualBox" with a sub-heading "Welcome to VirtualBox.org!". A large blue button with a red border says "Download VirtualBox 5.0". To the right, there is a "News Flash" section with several announcements. At the bottom, there is an "ORACLE" logo and a footer with "Contact - Privacy policy - Terms of Use".

VirtualBox

search...
Login Preferences

Welcome to VirtualBox.org!

VirtualBox is a powerful x86 and AMD64/Intel64 virtualization product for enterprise as well as home use. Not only is VirtualBox an extremely feature rich, high performance product for enterprise customers, it is also the only professional solution that is freely available as Open Source Software under the terms of the GNU General Public License (GPL) version 2. See "About VirtualBox" for an introduction.

Presently, VirtualBox runs on Windows, Linux, Macintosh, and Solaris hosts and supports a large number of [guest operating systems](#) including but not limited to Windows (NT 4.0, 2000, XP, Server 2003, Vista, Windows 7, Windows 8), DOS/Windows 3.x, Linux (2.4, 2.6 and 3.x), Solaris and OpenSolaris, OS/2, and OpenBSD.

VirtualBox is being actively developed with frequent releases and has an ever growing list of features, supported guest operating systems and platforms it runs on. VirtualBox is a community effort backed by a dedicated company: everyone is encouraged to contribute while Oracle ensures the product always meets professional quality criteria.

Download VirtualBox 5.0

Hot picks:

- Pre-built virtual machines for developers at [Oracle Tech Network](#)
- **Hyperbox** Open-source Virtual Infrastructure Manager [project site](#)
- **phpVirtualBox** AJAX web interface [project site](#)
- **IQEmu** automated Windows VM creation, application integration <http://mirage335-site.member.hacdc.org:6380/wiki/Category:IQEmu>

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<https://virtualbox.org/wiki/Downloads>

News Flash

- **New August 13th, 2015 VirtualBox 5.0.2 released!**
Oracle today released the first 5.0 maintenance release which improves stability and fixes regressions. See the [Changelog](#) for details.
- **New July 9th, 2015 VirtualBox 5.0 released!**
Read the official [press release](#) for details.
- **New July 10th, 2015 VirtualBox 4.3.30, 4.2.32, 4.1.30, and 4.0.32 released!**
Oracle today released maintenance releases which improve stability and fixes regressions. See the respective [changelogs](#) for details.
- **Important! February, 2015 We're hiring!**
Looking for a new challenge? We're looking for generic product developers (Russia).

[More information...](#)

Go to <http://virtualbox.org> and click [Download VirtualBox 5.0].

2. Install VirtualBox



The screenshot shows the VirtualBox website's download page. The browser address bar displays 'https://virtualbox.org/wiki/Downloads'. The page title is 'VirtualBox' and the main heading is 'Download VirtualBox'. Below this, there is a section for 'VirtualBox binaries' with a list of download links. The link for 'VirtualBox 5.0.2 for Windows hosts' is highlighted with a red box. A Windows security warning dialog box is overlaid at the bottom, asking for permission to run the file 'download.virtualbox.org의 VirtualBox-5.0.2-102096-Win.exe(111MB)'. The dialog box contains the text: '이 형식의 파일은 사용자의 컴퓨터에 피해를 줄 수 있습니다.' and buttons for '실행(R)', '저장(S)', and '취소(C)'. The page also includes a sidebar with navigation links like 'About', 'Screenshots', and 'Downloads', and a search bar in the top right corner.

VirtualBox

Download VirtualBox

Here, you will find links to VirtualBox binaries and its source code.

VirtualBox binaries

By downloading, you agree to the terms and conditions of the respective license.

- **VirtualBox platform packages.** The binaries are released under the terms of the GPL version 2.
 - **VirtualBox 5.0.2 for Windows hosts** ⇨ x86/amd64
Please be aware that Windows 10 is not yet officially supported! There are known problems with VirtualBox 5.0.2 on Windows 10 hosts and with Windows 10 guests. Some of the problems are fixed in the most recent test build which can be found here.
 - **VirtualBox 5.0.2 for OS X hosts** ⇨ amd64
 - **VirtualBox 5.0.2 for Linux hosts**
 - **VirtualBox 5.0.2 for Solaris hosts** ⇨ amd64
- **VirtualBox 5.0.2 Oracle VM VirtualBox Extension Pack** ⇨ All supported platforms
Support for USB 2.0 devices, VirtualBox RDP and PXE boot for Intel cards. See this chapter from the User Manual for an introduction to this Extension Pack. The Extension Pack binaries are released under the VirtualBox Personal Use and Evaluation License (PUEL).
Please install the extension pack with the same version as your installed version of VirtualBox!
If you are using VirtualBox 4.3.30, please download the extension pack ⇨ here.
If you are using VirtualBox 4.2.32, please download the extension pack ⇨ here.
If you are using VirtualBox 4.1.40, please download the extension pack ⇨ here.
If you are using VirtualBox 4.0.32, please download the extension pack ⇨ here.
- **VirtualBox 5.0.2 Software Developer Kit (SDK)** ⇨ All platforms

See the [changelog](#) for what has changed.
You might want to compare the

- SHA256 checksums or the
- MD5 checksums

to verify the integrity of downloaded packages.
The SHA256 checksums should be favored as the MD5 algorithm must be treated as insecure!

Note:

Use

The Vi

download.virtualbox.org의 VirtualBox-5.0.2-102096-Win.exe(111MB)을(를) 실행하거나 저장하시겠습니까?

이 형식의 파일은 사용자의 컴퓨터에 피해를 줄 수 있습니다.

실행(R) 저장(S) 취소(C)

having to install the

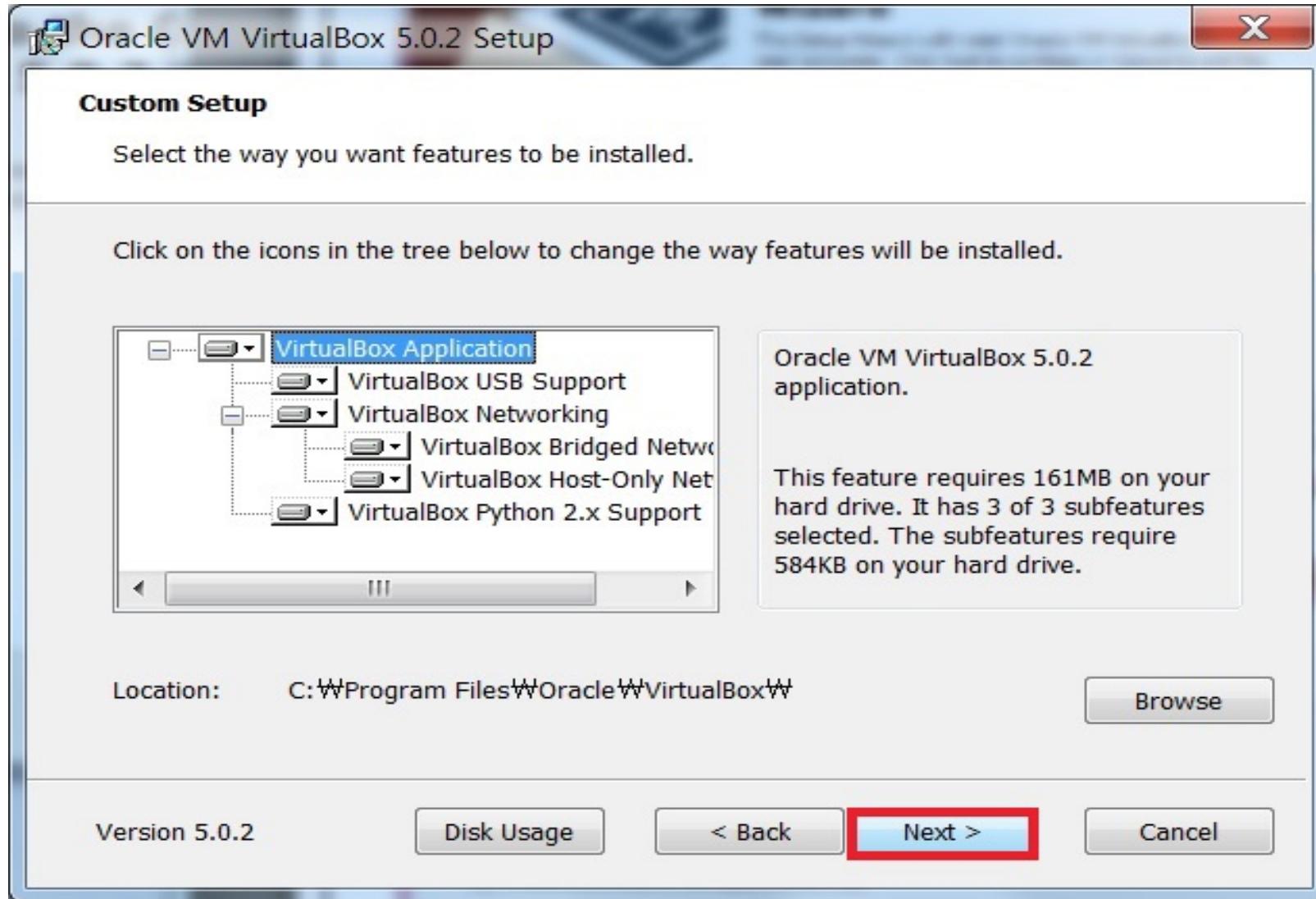
Click [VirtualBox 5.0.2 for Windows hosts] at the top.

2. Install VirtualBox



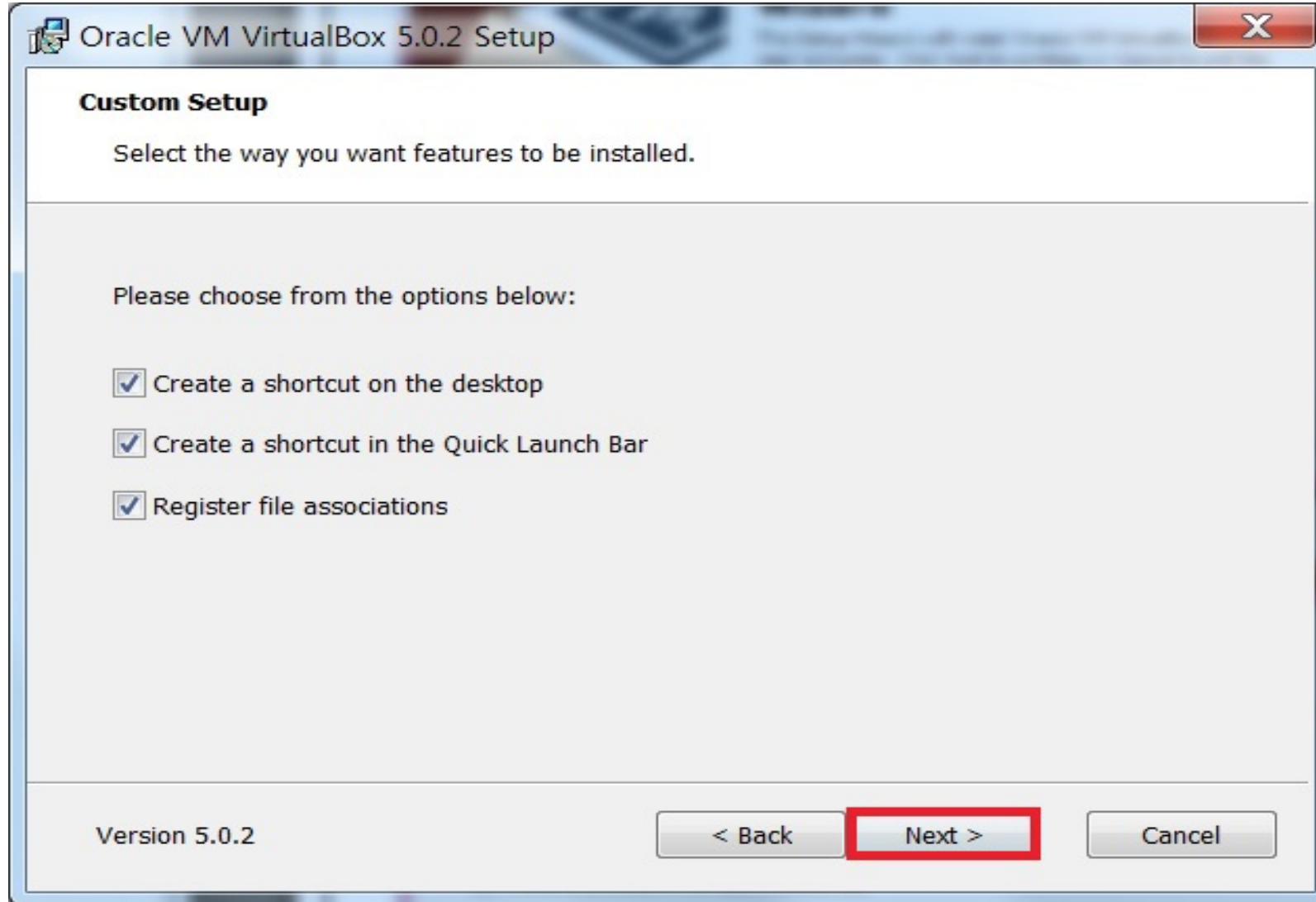
Click the button highlighted in red.

2. Install VirtualBox



Click the button highlighted in red.

2. Install VirtualBox



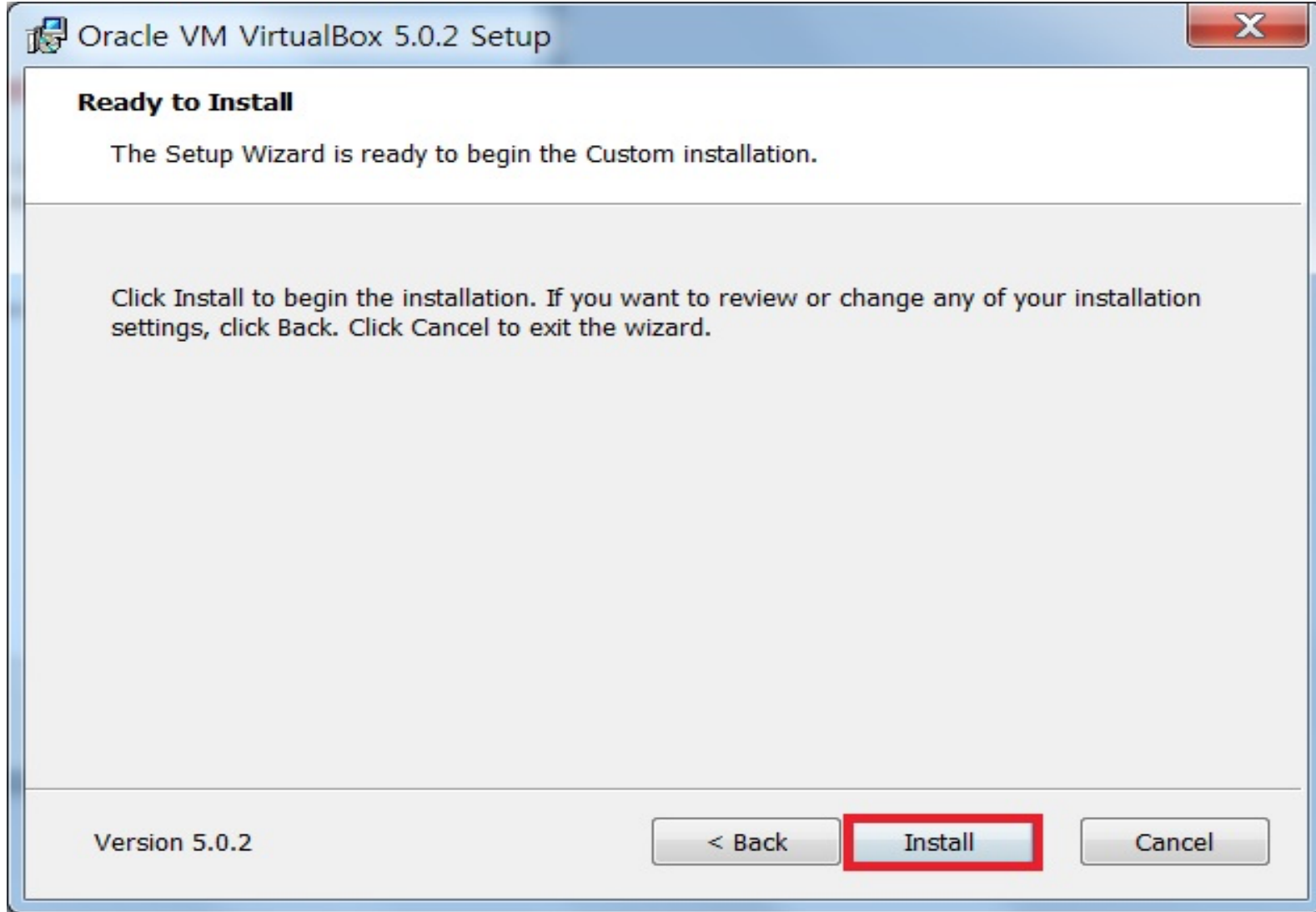
Click the button highlighted in red.

2. Install VirtualBox



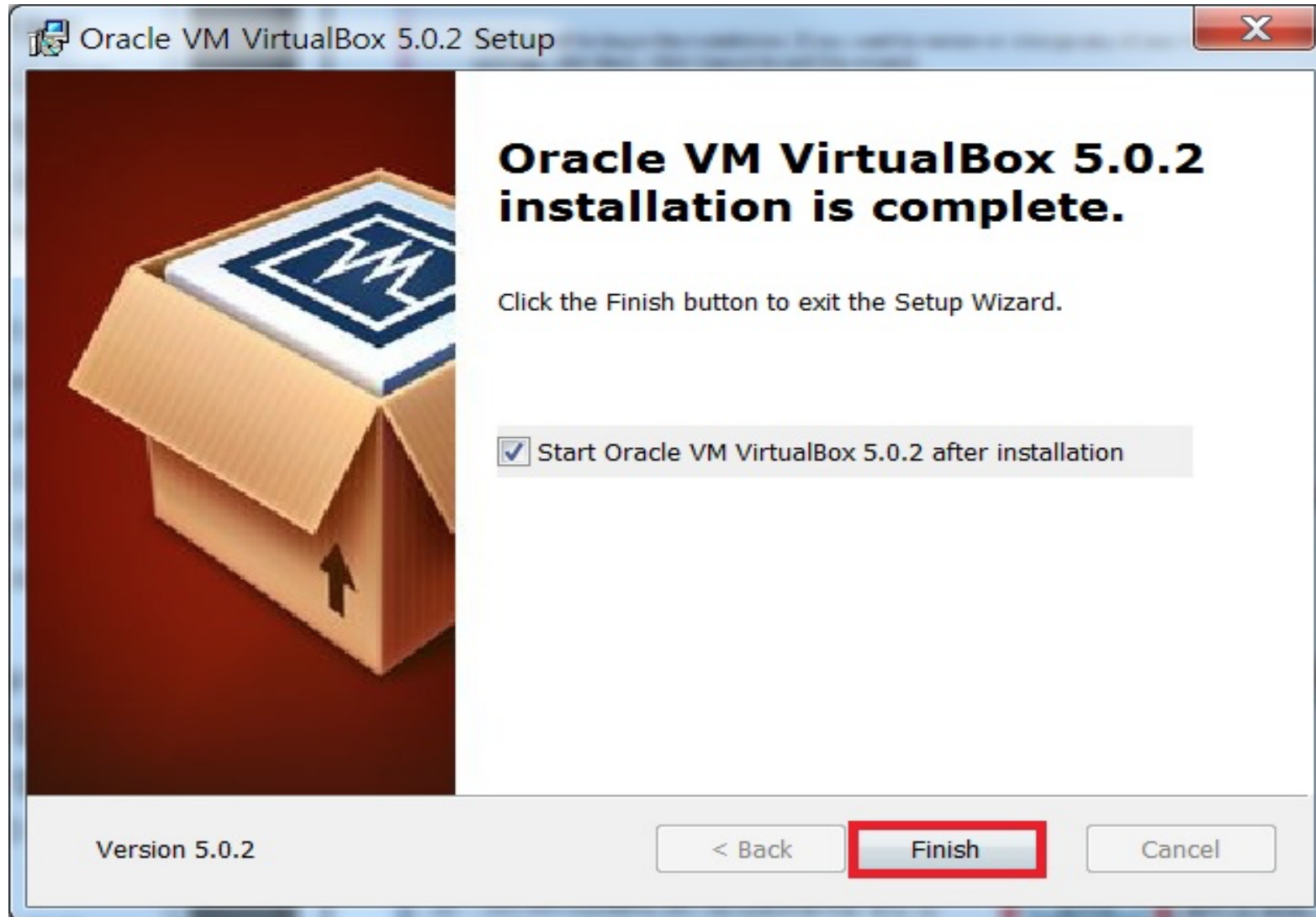
Click the button highlighted in red.

2. Install VirtualBox



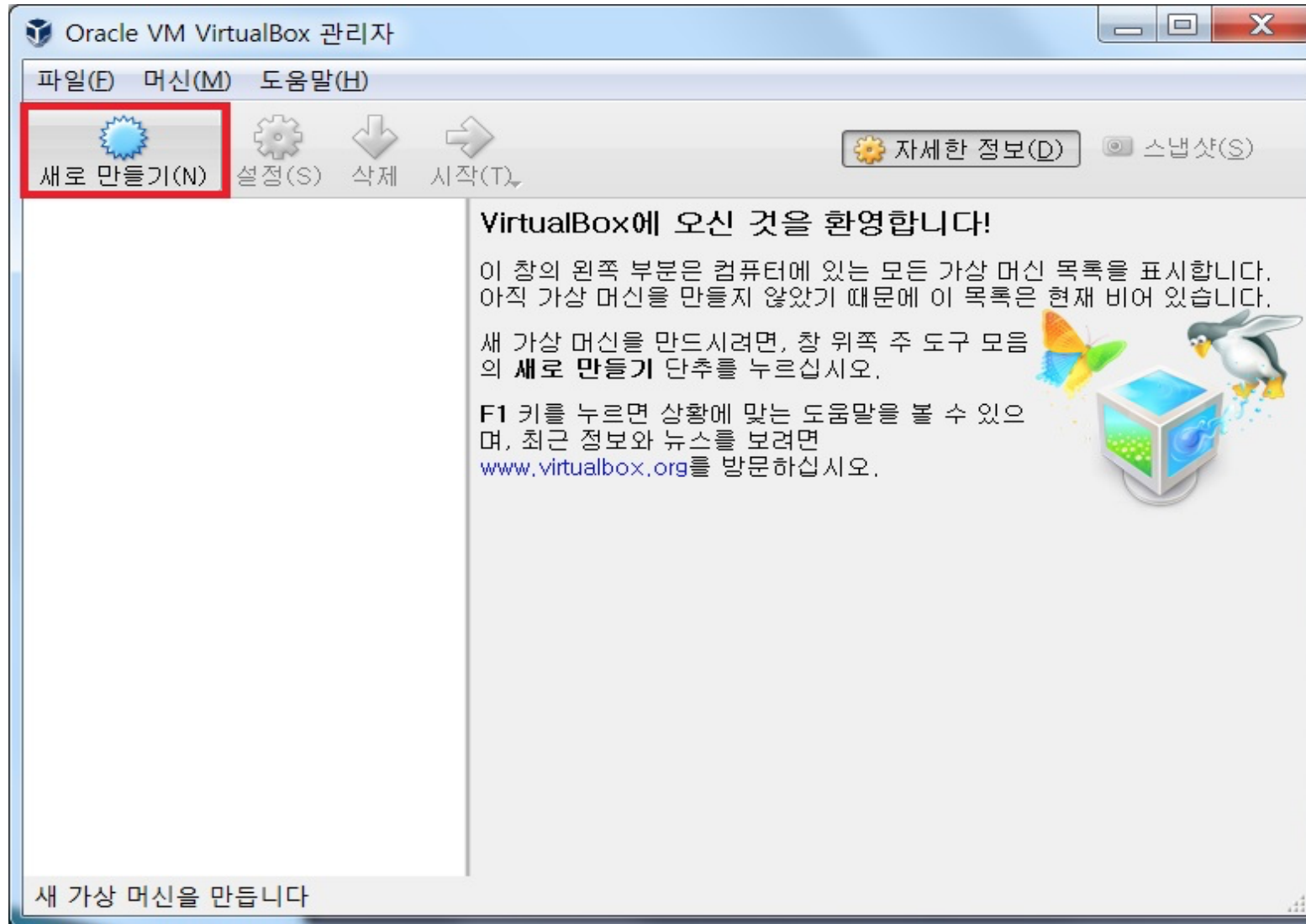
Click the button highlighted in red.

2. Install VirtualBox



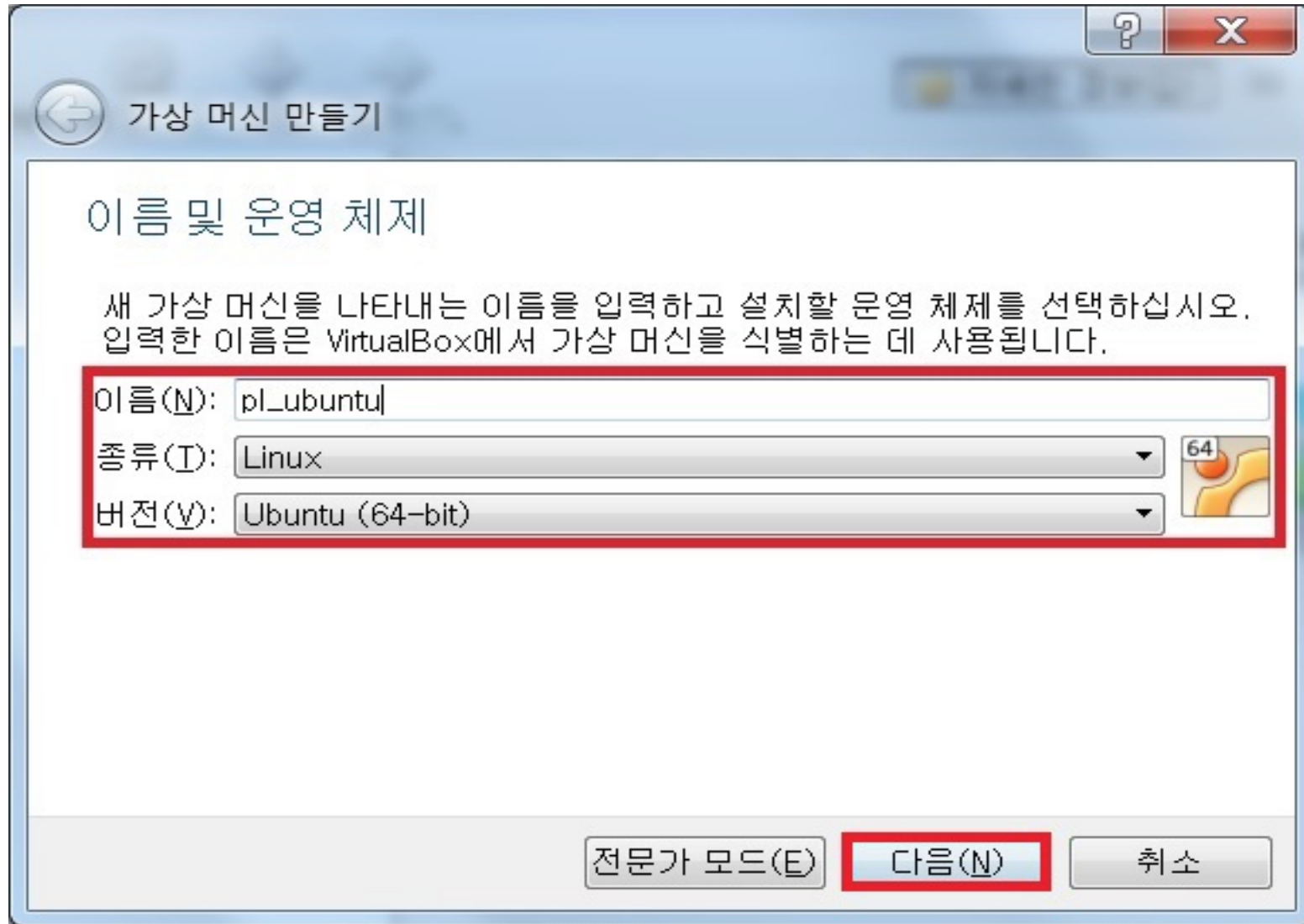
Click the button highlighted in red.

2. Install VirtualBox



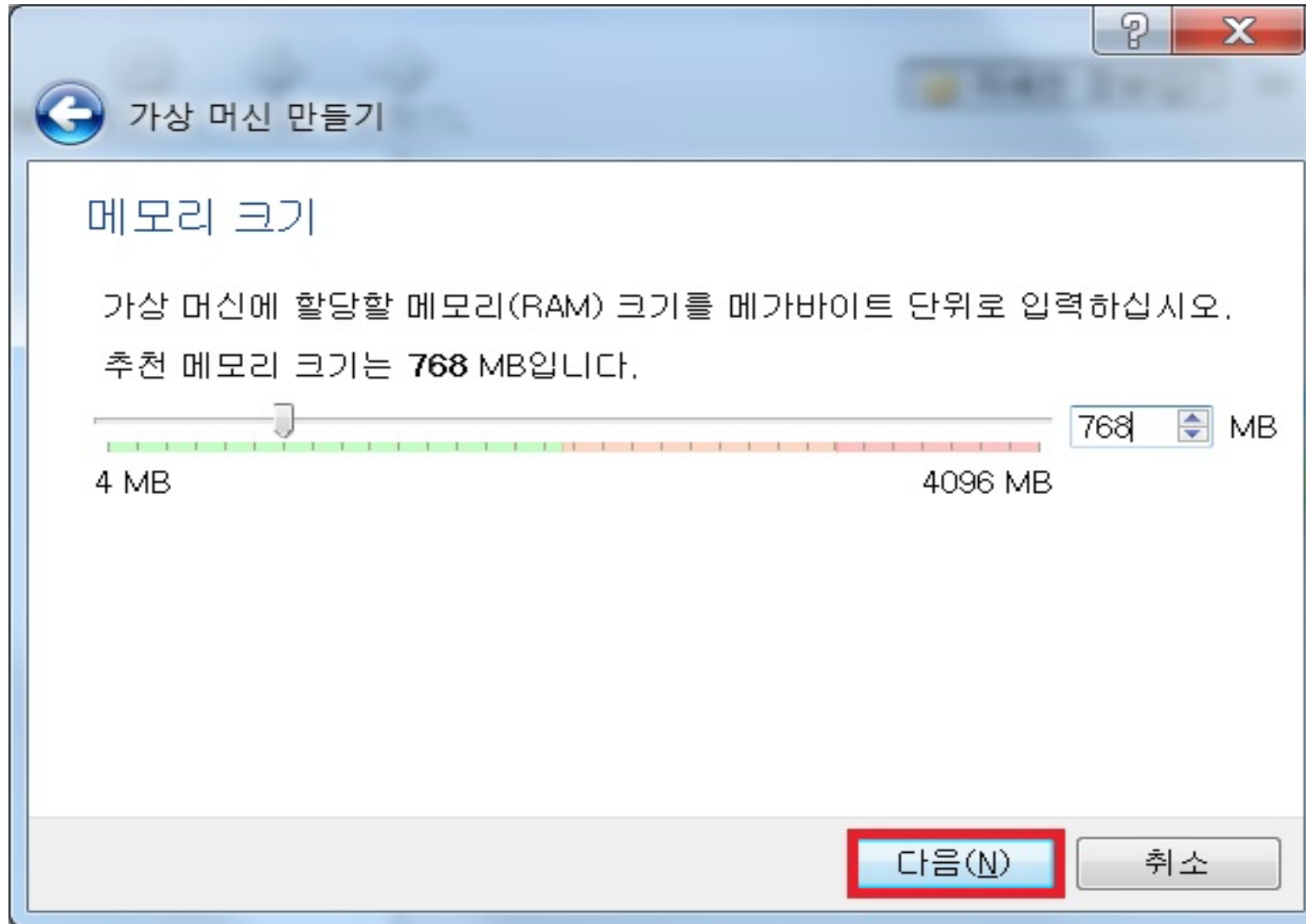
Click the button highlighted in red.

2. Install VirtualBox



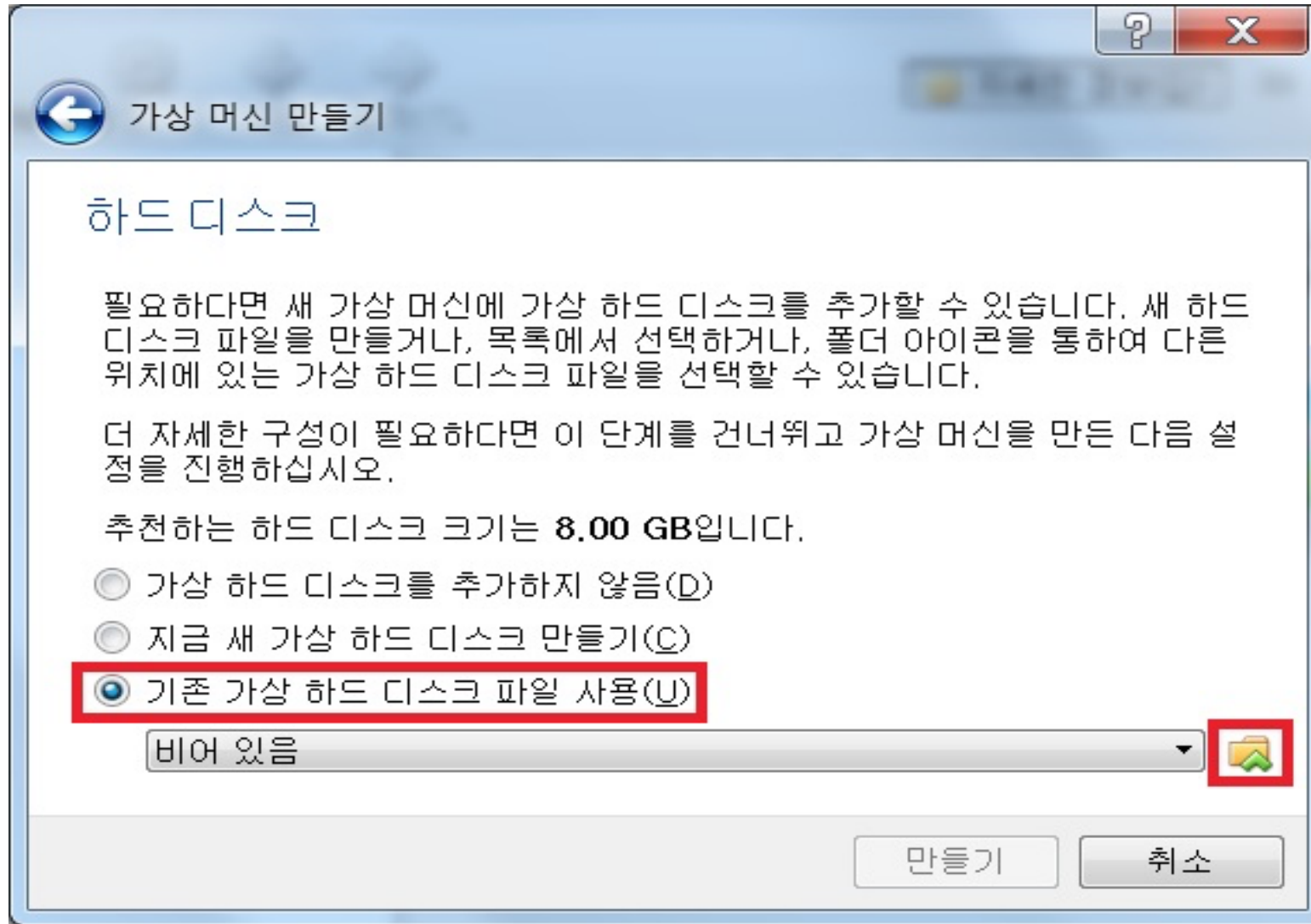
Click the button highlighted in red.

2. Install VirtualBox



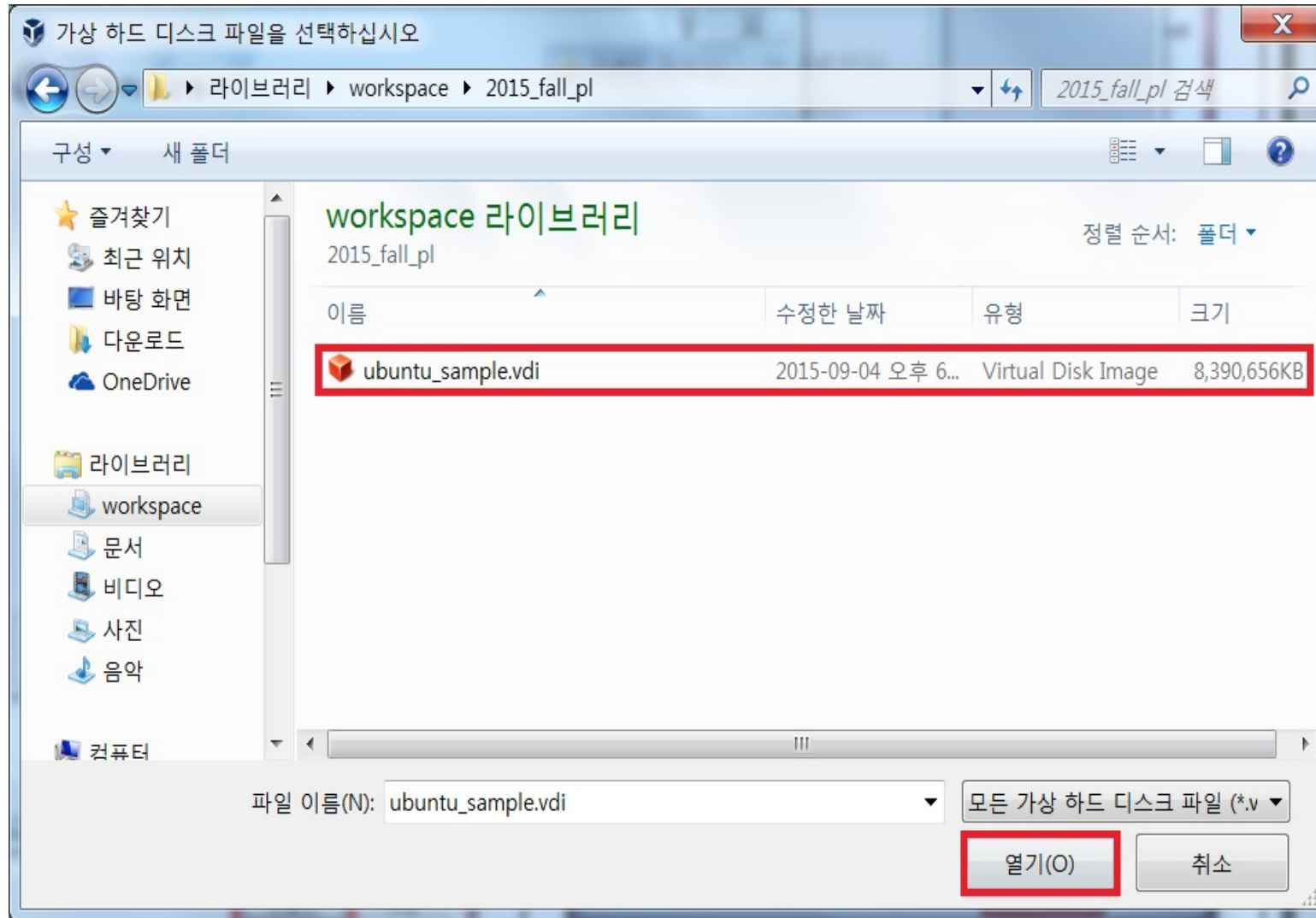
Click the button highlighted in red.

2. Install VirtualBox



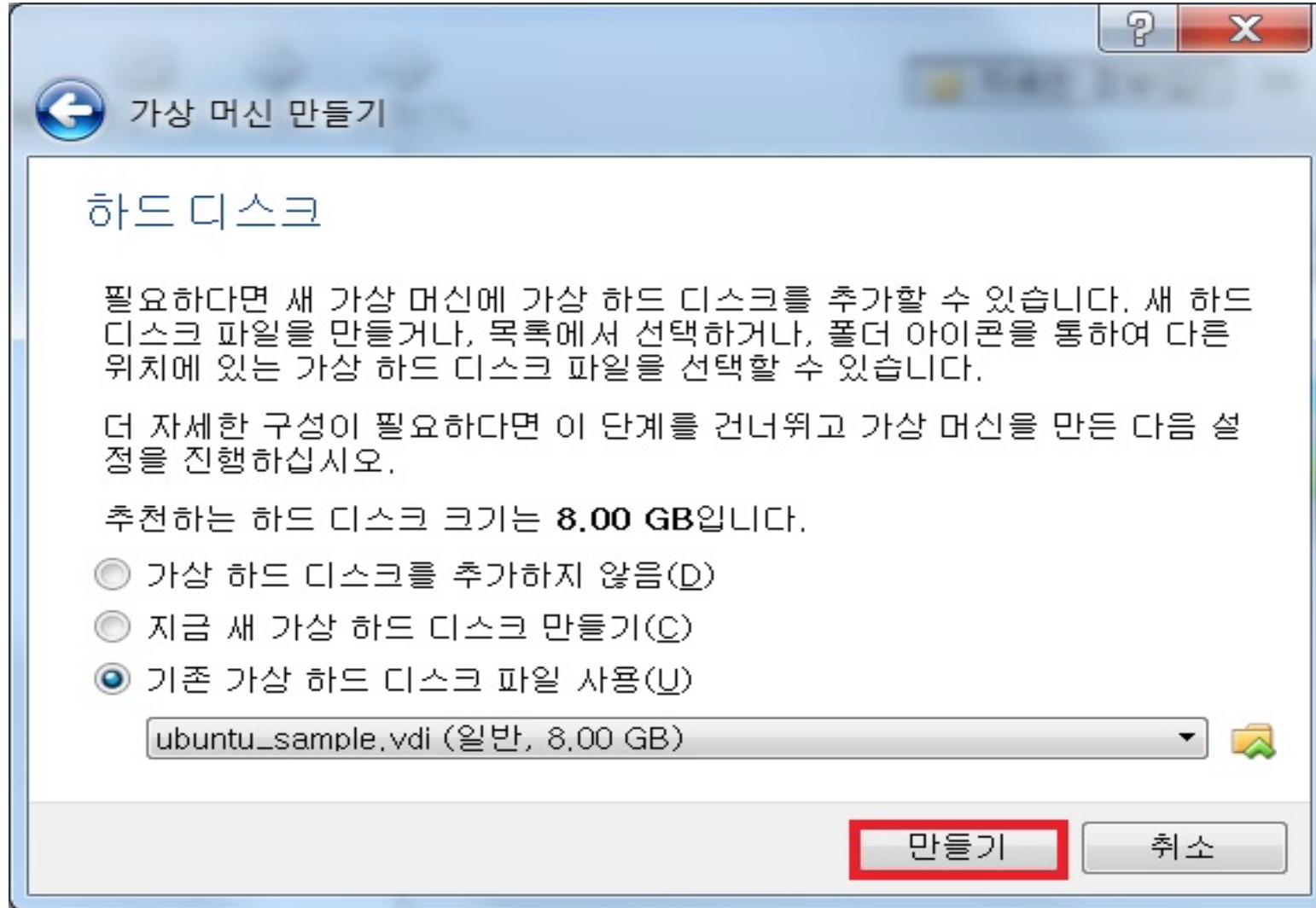
Select the last option and
click the Browse button on the bottom right side.

2. Install VirtualBox



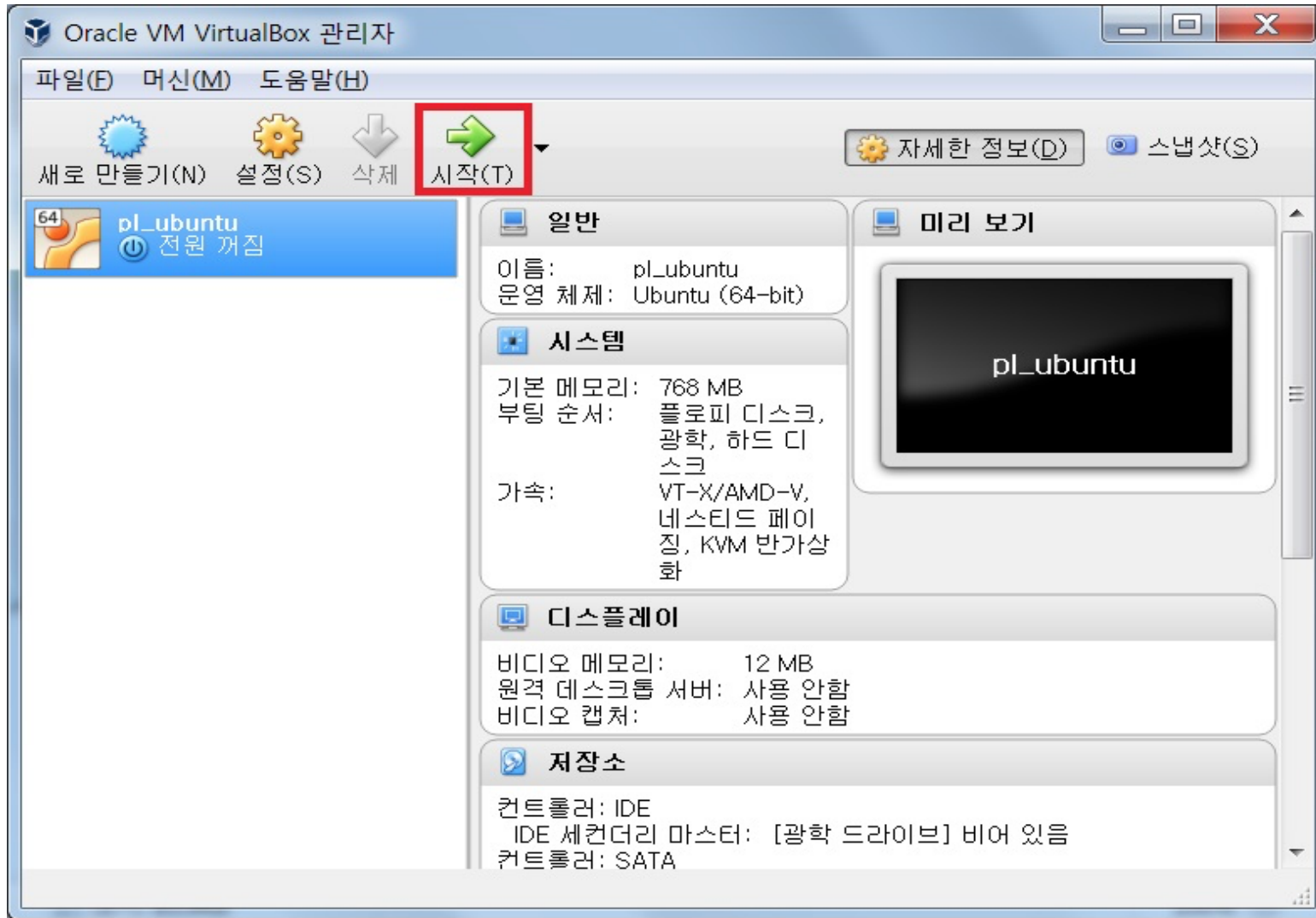
Open the VirtualBox image file you downloaded.

2. Install VirtualBox



Click the button highlighted in red.

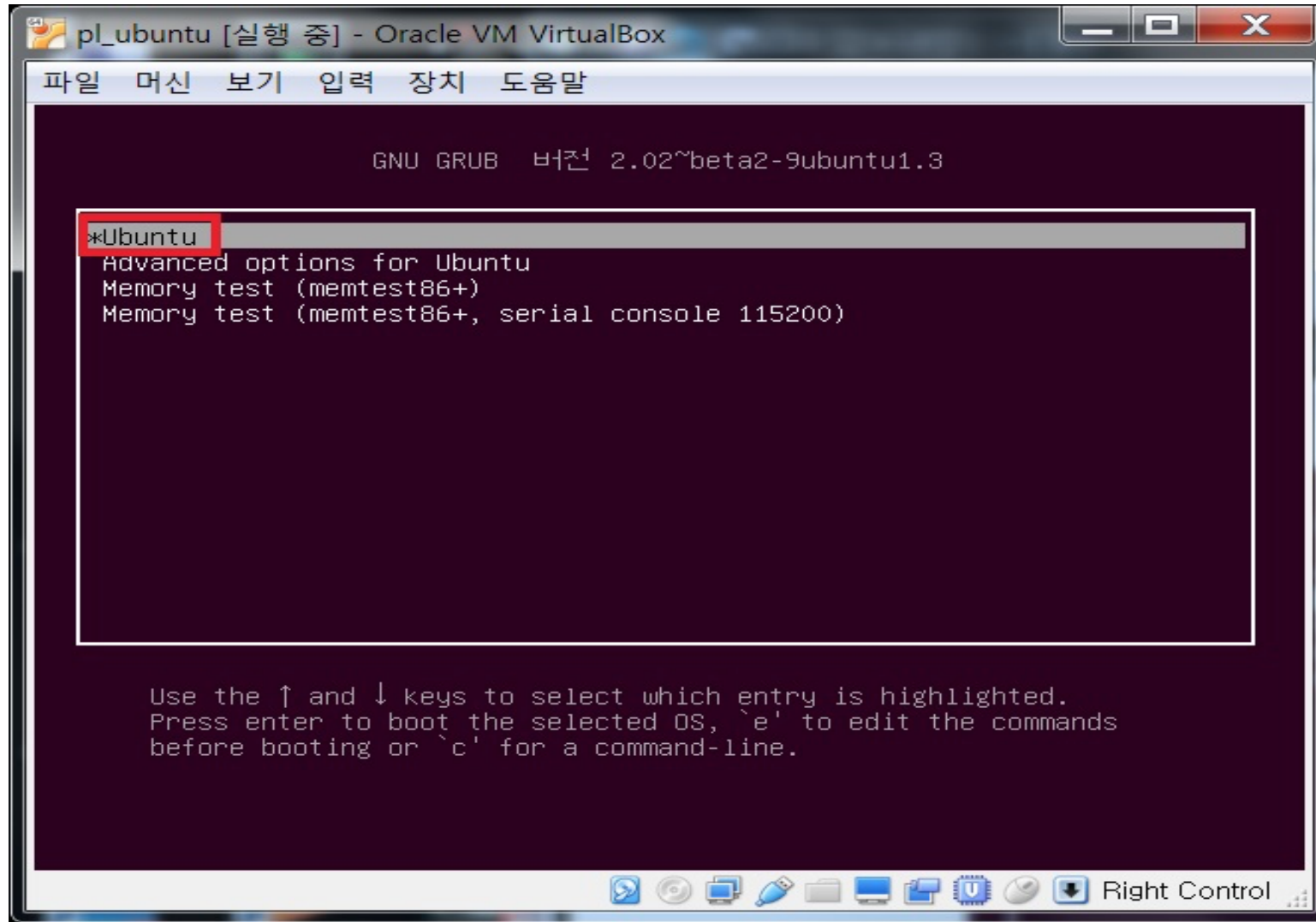
3. Run Ubuntu on VirtualBox



Almost done!

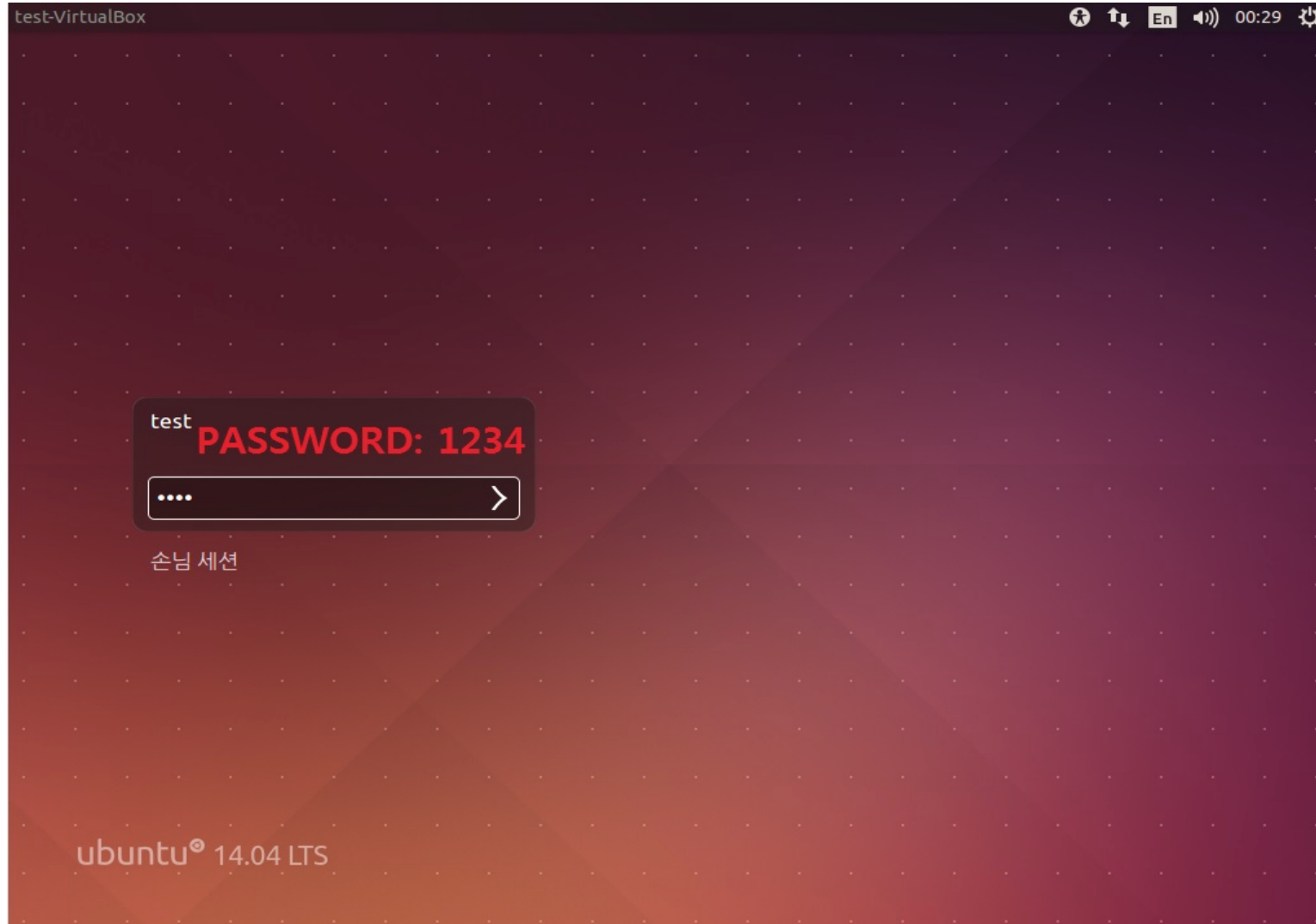
Click the button highlighted in red and then you can start Ubuntu.

3. Run Ubuntu on VirtualBox



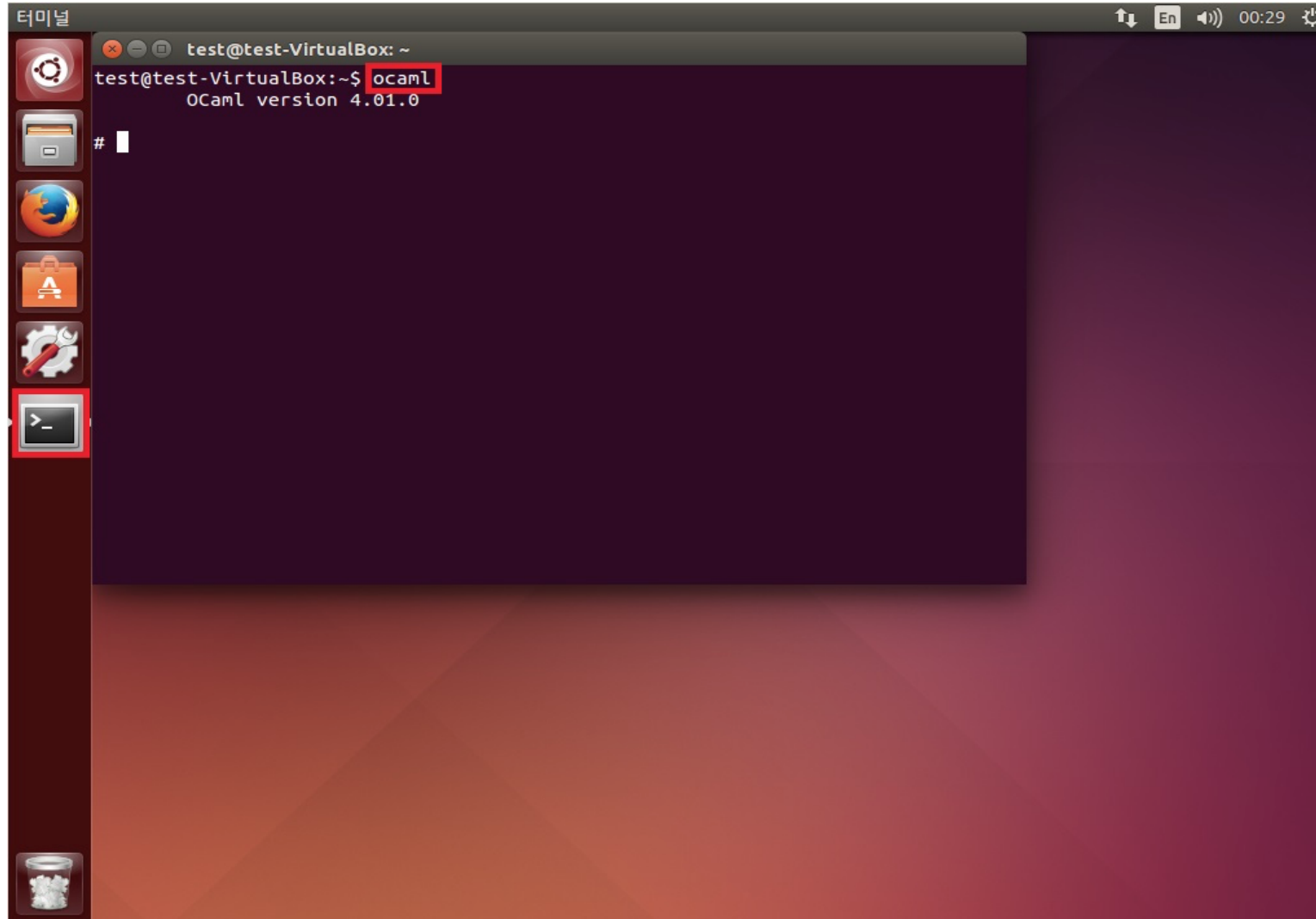
Choose the option highlighted in red.

3. Run Ubuntu on VirtualBox



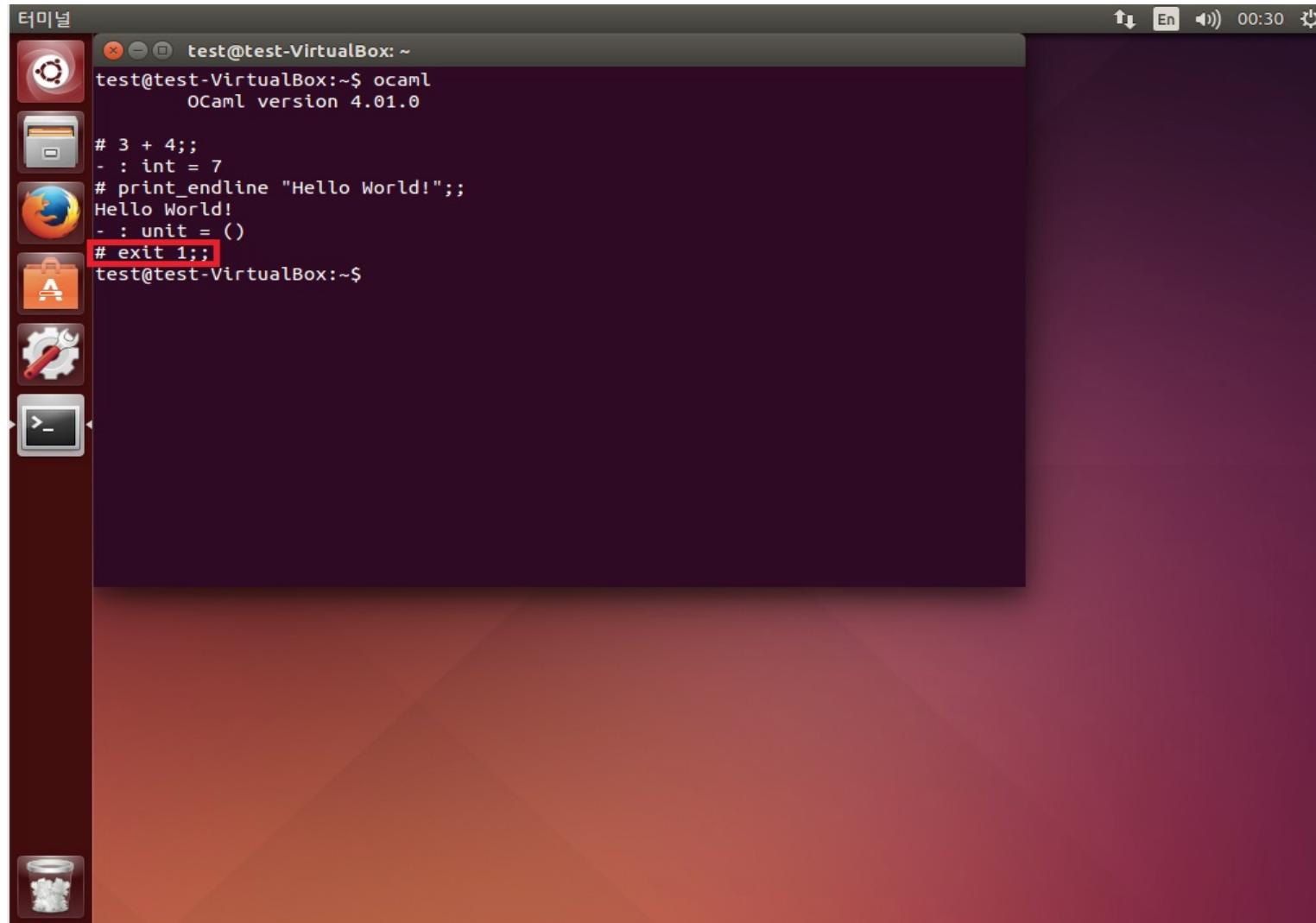
Log in with the password 1234.

3. Run Ubuntu on VirtualBox



Open a terminal by clicking the black square icon highlighted in red.
After typing “ocaml”, you can play with Ocaml in interactive mode.
(Ocaml toplevel system, REPL)

3. Run Ubuntu on VirtualBox



The screenshot shows a terminal window titled "터미널" (Terminal) with the prompt "test@test-VirtualBox: ~". The terminal displays the following OCaml code and its output:

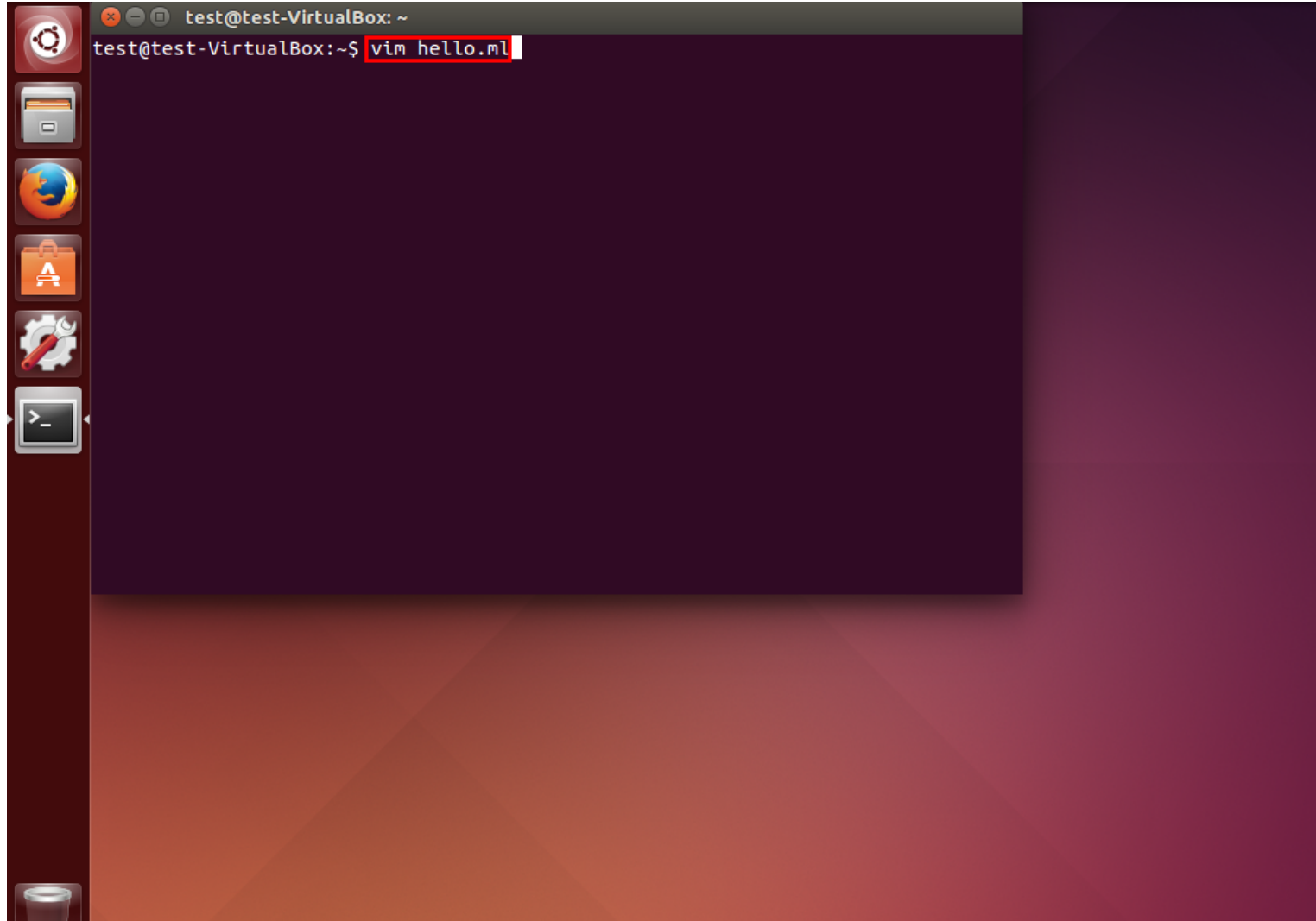
```
test@test-VirtualBox:~$ ocaml
OCaml version 4.01.0

# 3 + 4;;
- : int = 7
# print_endline "Hello World!";;
Hello World!
- : unit = ()
# exit 1;;
test@test-VirtualBox:~$
```

The line "# exit 1;;" is highlighted with a red box. The terminal window is overlaid on a desktop environment with a dark purple and red gradient background. The desktop has a sidebar on the left with icons for settings, file manager, web browser, application store, and system tools. The top of the window shows system tray icons for volume, language (En), and time (00:30).

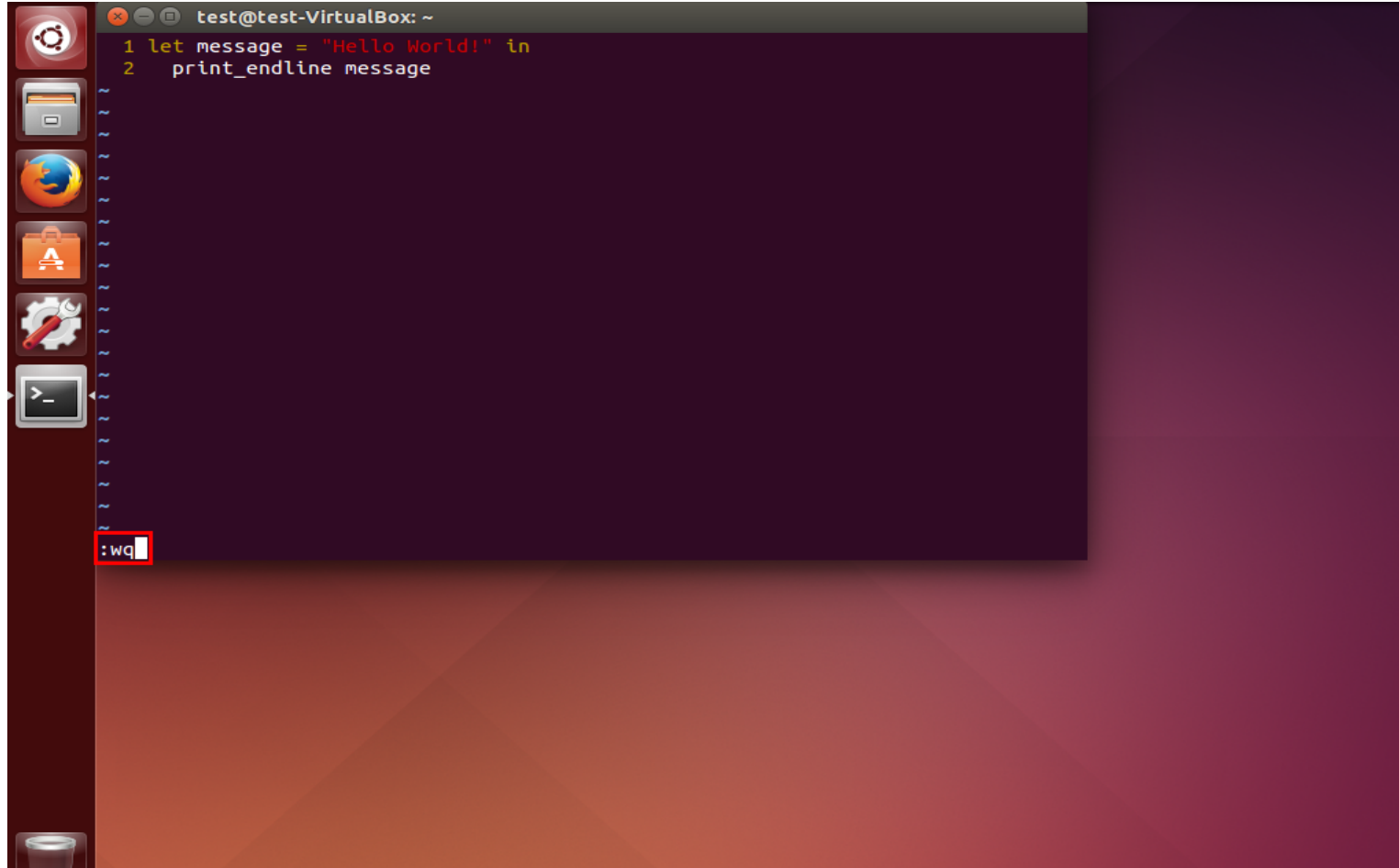
You can get back to terminal by typing: exit 1;;

4. Write a Source File with Vim



Edit a file by the command: `vim [options] [filename]`

4. Write a Source File with Vim



```
test@test-VirtualBox: ~
1 let message = "Hello World!" in
2 print_endline message
:wq
```

It begins in **command mode**, where you cannot edit text.

Press 'i' to trigger **insert mode** that lets you edit it.

Hitting 'Esc' returns you to command mode,
and you can type ``:wq`` to save and finish the file.

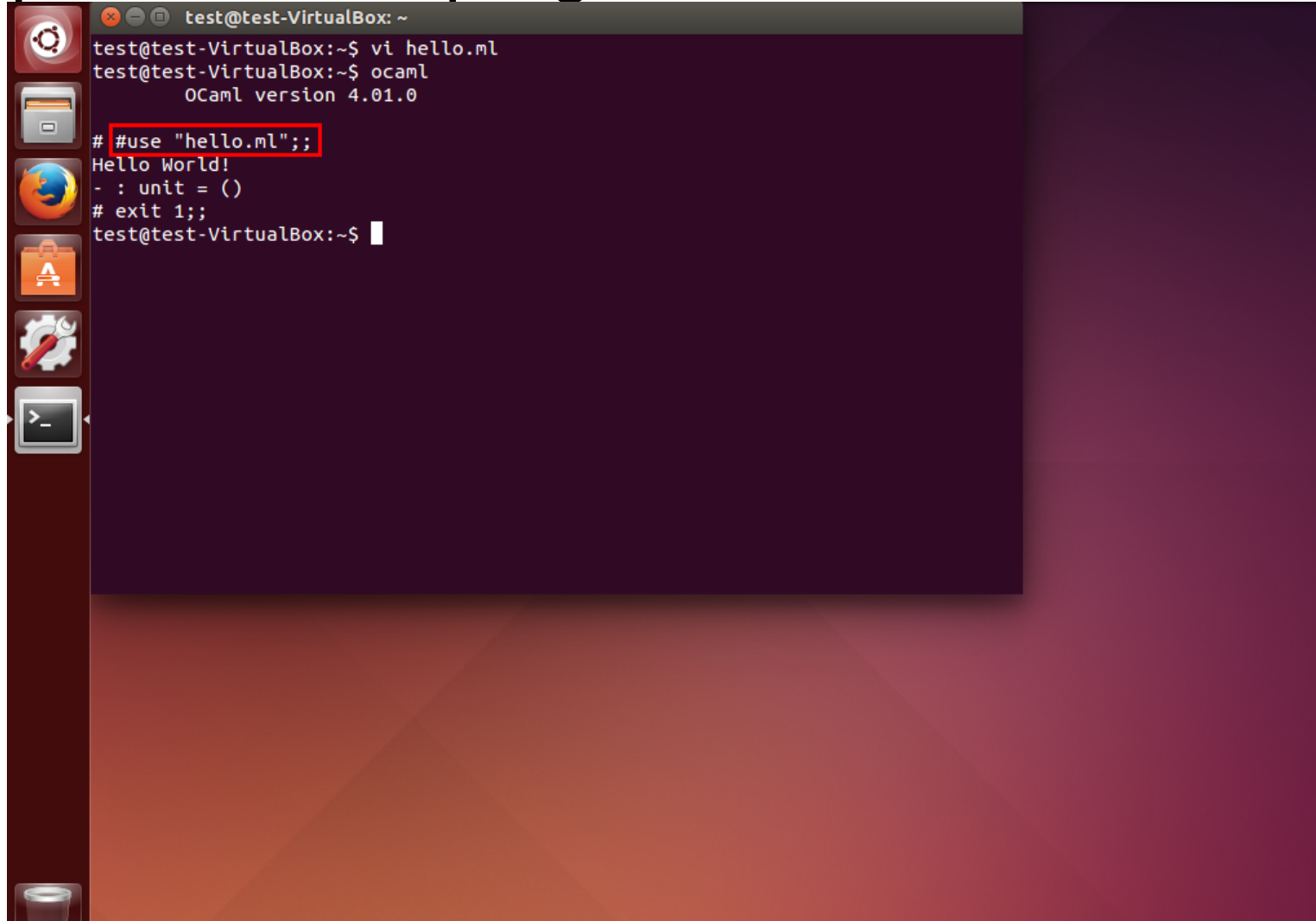
(``:w`` for save only)

4. Write a Source File with Vim



You can learn Vim with Vimtutor, and the tutorial is provided in both English and Korean.
It is strongly recommended to try it. (It will take just about 20 minutes!)

5. Compile and Run programs

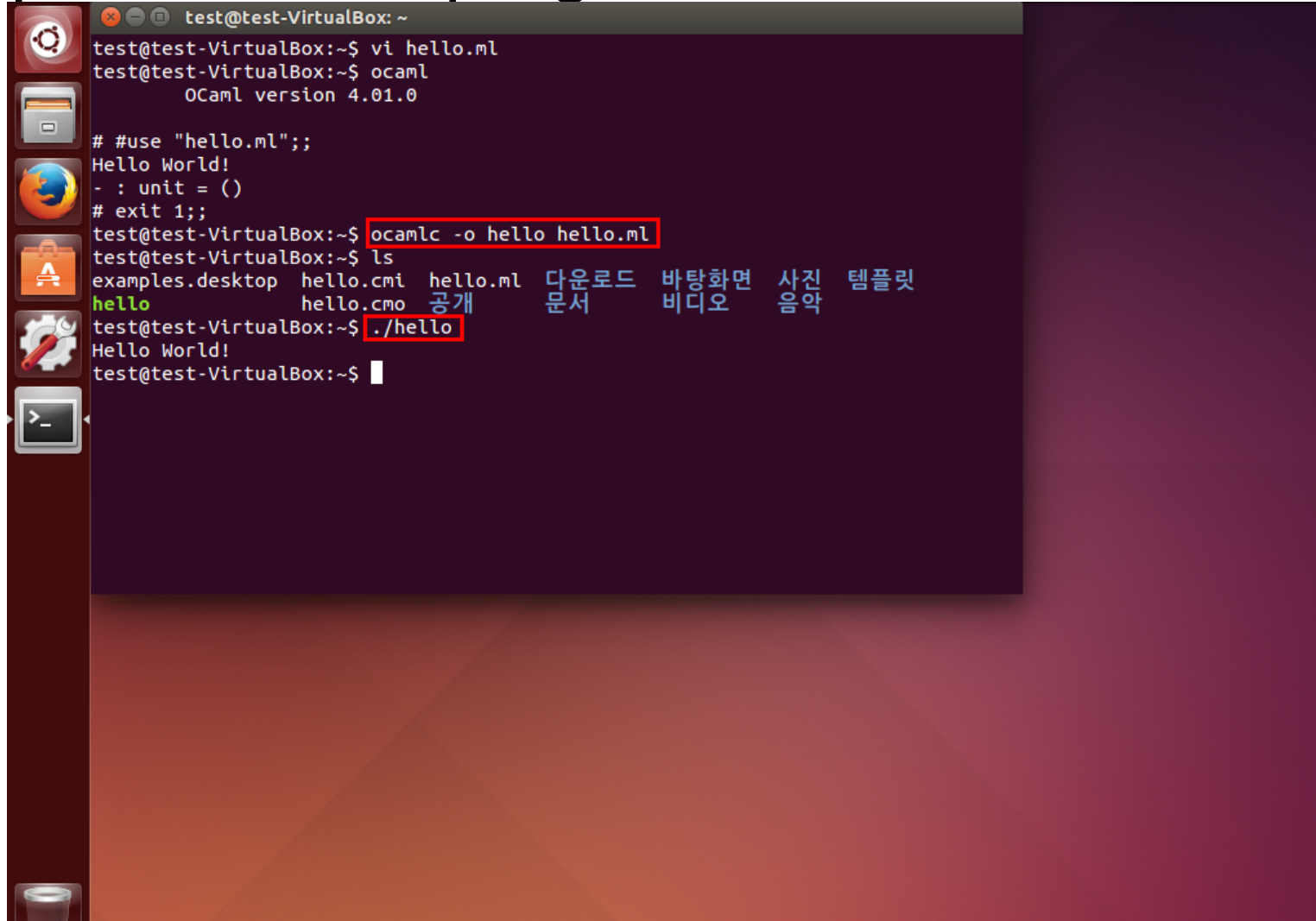
A screenshot of a terminal window in a virtual machine. The window title is "test@test-VirtualBox: ~". The terminal shows the following commands and output:

```
test@test-VirtualBox:~$ vi hello.ml
test@test-VirtualBox:~$ ocaml
OCaml version 4.01.0
# #use "hello.ml";;
Hello World!
- : unit = ()
# exit 1;;
test@test-VirtualBox:~$
```

The line "# #use \"hello.ml\";;" is highlighted with a red box. The terminal window is set against a dark purple background with a vertical sidebar on the left containing various application icons.

You can import your source file by “`#use [filename]`” command on the REPL.

5. Compile and Run programs

A terminal window titled 'test@test-VirtualBox: ~' showing the process of compiling and running an OCaml program. The user enters 'vi hello.ml' to edit a file containing '#use "hello.ml";; Hello World! - : unit = () # exit 1;;'. Then, they run 'ocamlc -o hello hello.ml' to compile it. A subsequent 'ls' command shows the resulting 'hello' and 'hello.cmo' files. Finally, running './hello' outputs 'Hello World!'.

```
test@test-VirtualBox:~$ vi hello.ml
test@test-VirtualBox:~$ ocaml
OCaml version 4.01.0

# #use "hello.ml";;
Hello World!
- : unit = ()
# exit 1;;
test@test-VirtualBox:~$ ocamlc -o hello hello.ml
test@test-VirtualBox:~$ ls
examples.desktop  hello.cmi  hello.ml  다운로드  바탕화면  사진  템플릿
hello             hello.cmo  공개      문서      비디오   음악
test@test-VirtualBox:~$ ./hello
Hello World!
test@test-VirtualBox:~$
```

Like the C language, you can compile programs and run executable files.

For compile, type: `ocamlc -o [output] [source file]`

The End

It is highly recommended that students use Ubuntu(OS) and Vim(Editor).
Q/A's and discussions will be done through our Google Plus Community.