Creative Software Design

1 - Lab1 - Environment Setting

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Introduction

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- Undergraduate Mentor: 장보경(Thu), 남하욱(Fri)

Today's Topics

- Install Ubuntu
- How to use Terminal
- Vim Basic Usage

Today's Lab

- Many of today's slides overlap with the contents of last semester's Introduction to Software Design (소프트웨어입문설계) lab slides, so TA will proceed quickly.

- If you are unfamiliar with the today's topics, ask the TA a question so that you can understand it.

Development Environment in This Class

- OS: Ubuntu
- Compiler & Linker: g++
- Build system: make, cmake

- Assignments will be graded in this environment.
  - Even if it builds and runs without any problem in another OS (ex. Windows), **you will not receive a score if it does not build and run in this environment.**

Development Environment in This Class

- If you're using OS other than Ubuntu, use virtual machine.
  - http://www.virtualbox.org/
- Ubuntu: Ubuntu 22.04 is recommended.
  - http://releases.ubuntu.com/22.04
- Editor: Vim is recommended.

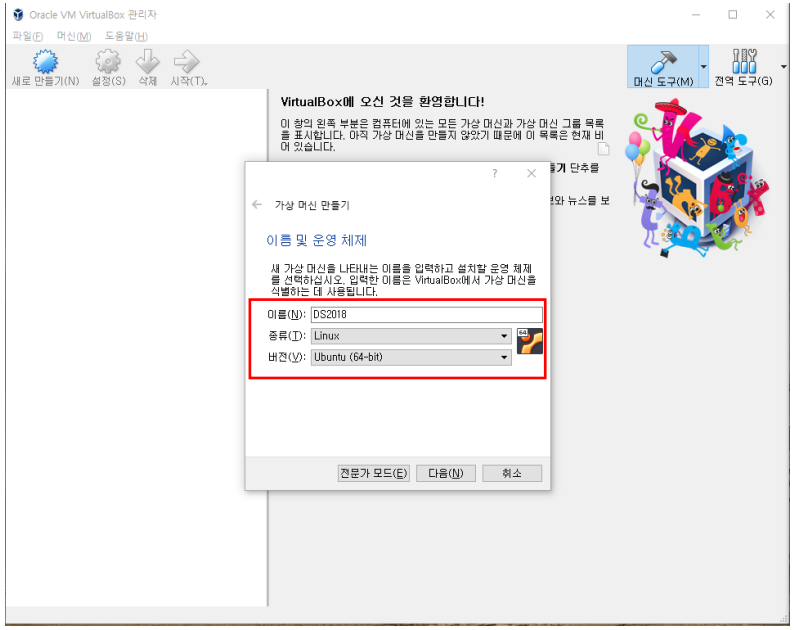
Install Ubuntu

Install Ubuntu in Virtual Box

- If you're using a computer with Ubuntu installed, you can use it as is.

- Following slides assume you're using other OSs.

How to install Ubuntu



- Name : (any name you want)
- Type : Linux
- Version : Ubuntu (64-bit)

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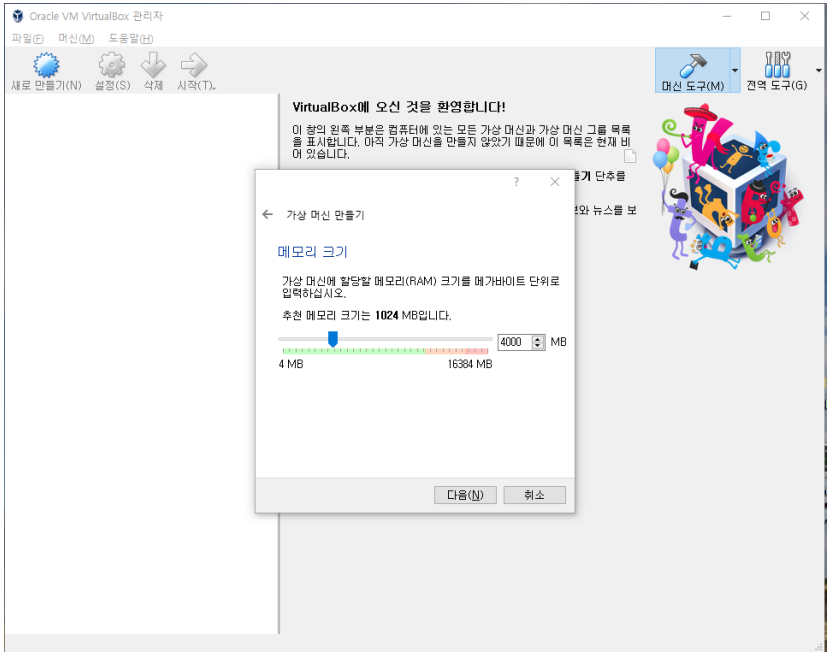
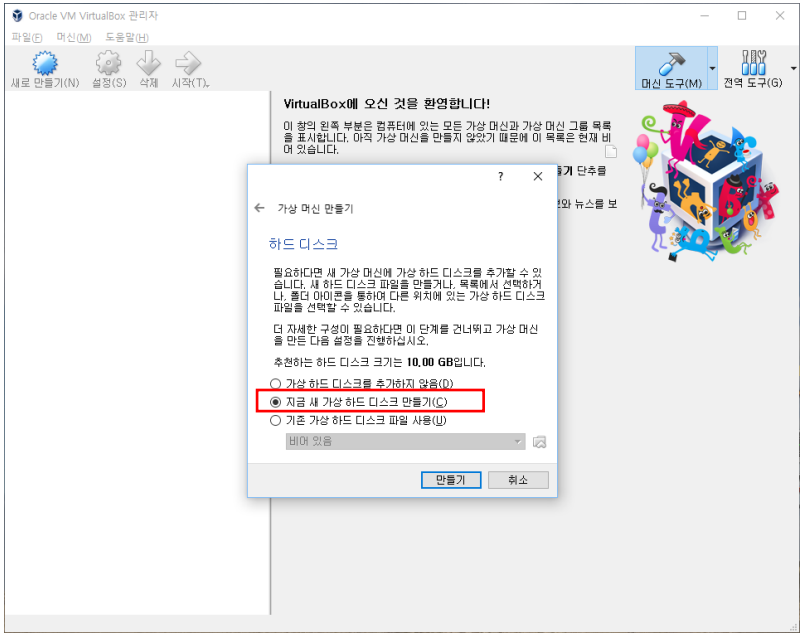
How to install Ubuntu



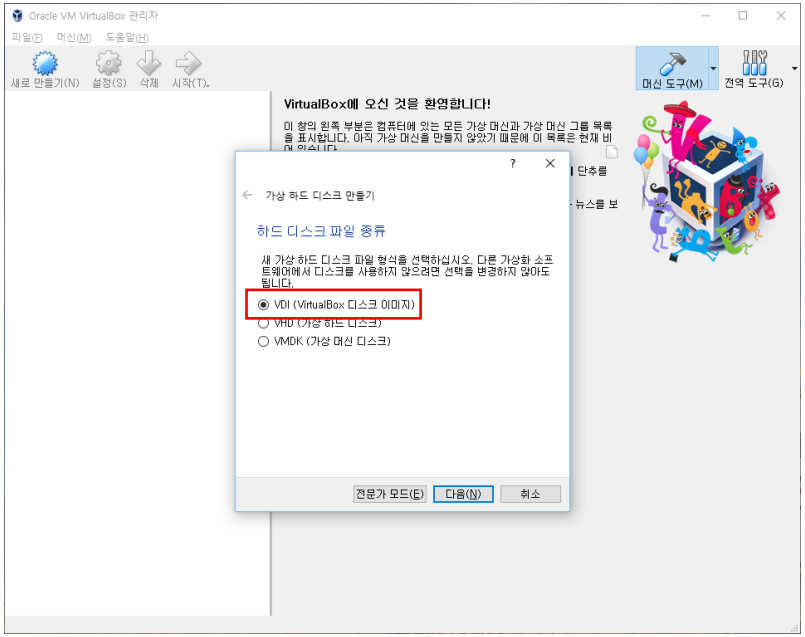
- Memory size : (any size)

How to install Ubuntu



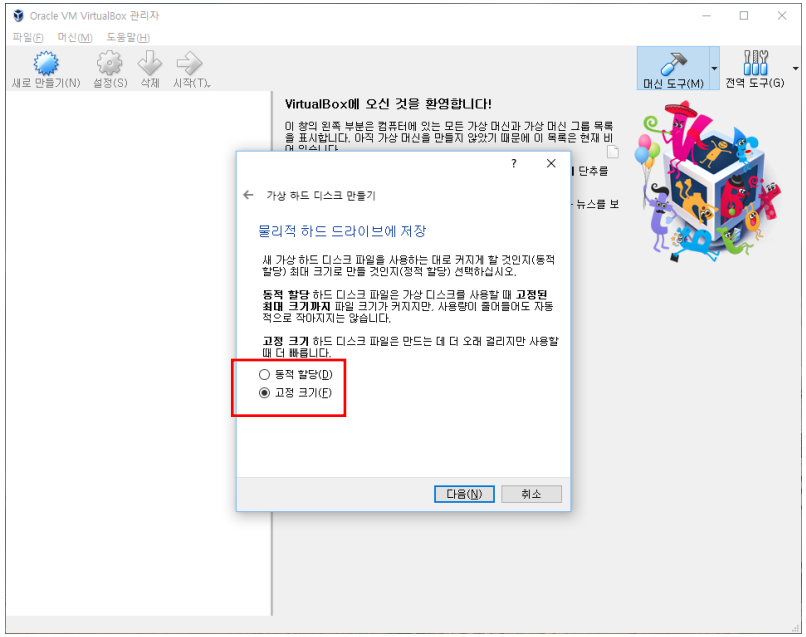
- Create a virtual hard disk

How to install Ubuntu



- VDI

How to install Ubuntu



- Recommendation: Fixed size

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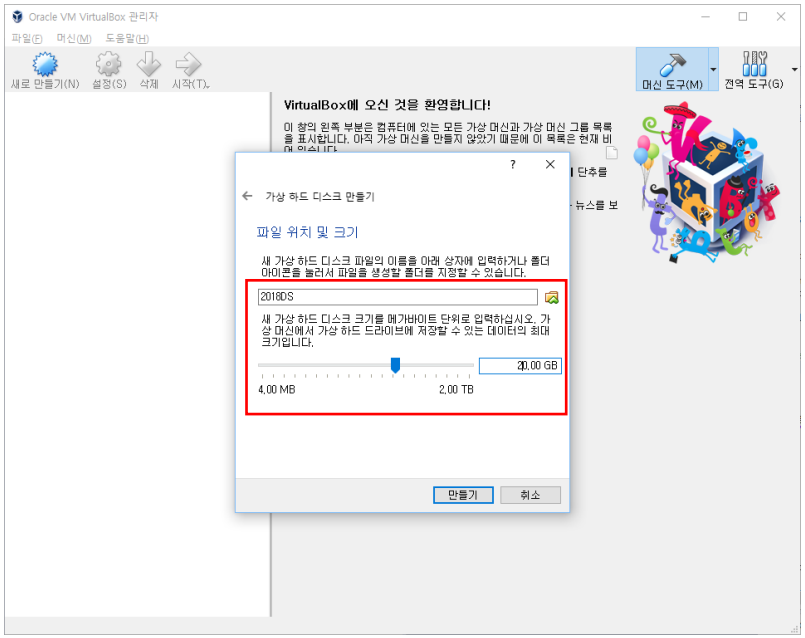
How to install Ubuntu



- Virtual disk file location & size:
- any location you want
- any size you want (e.g. 20GB)

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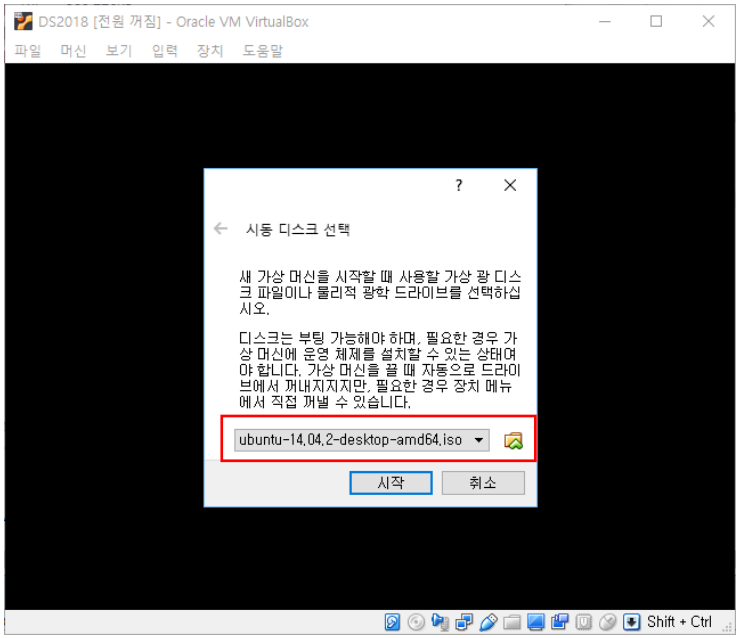
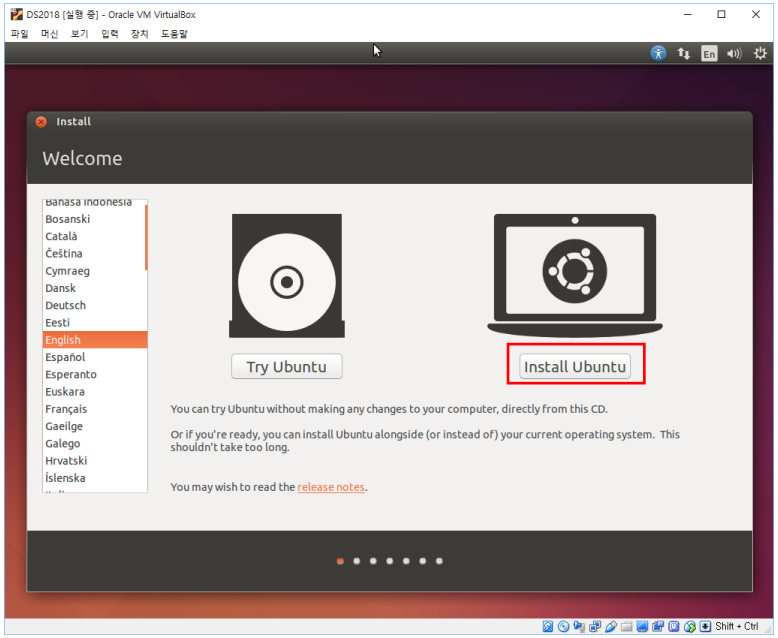
How to install Ubuntu

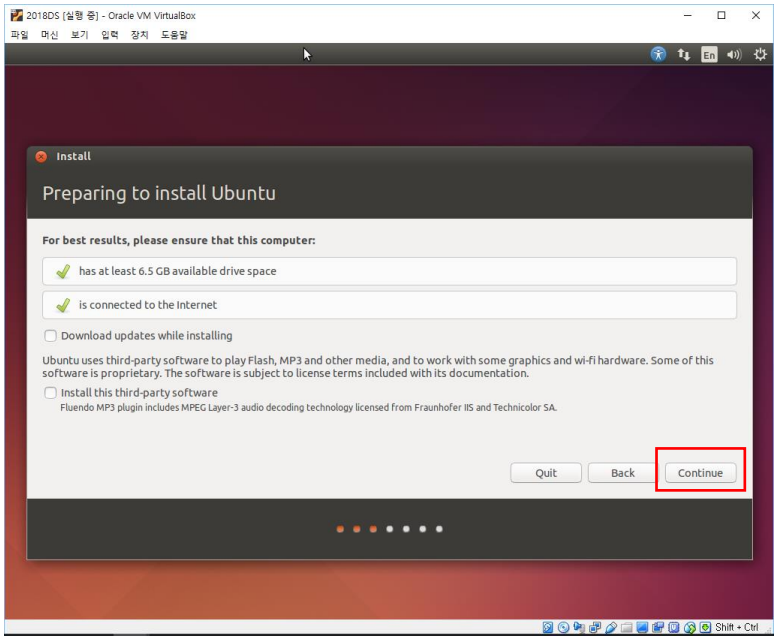


- Choose the downloaded Ubuntu .iso file as a boot disk

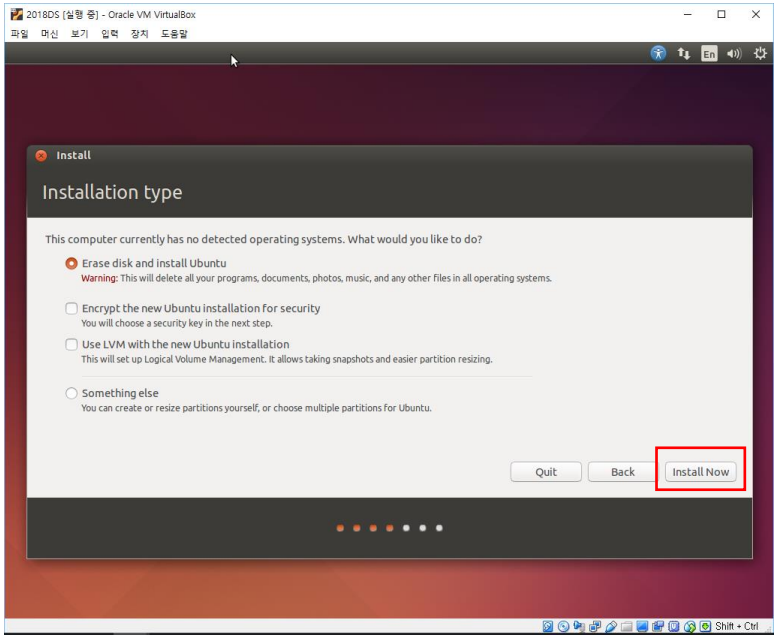
How to install Ubuntu



How to install Ubuntu



How to install Ubuntu



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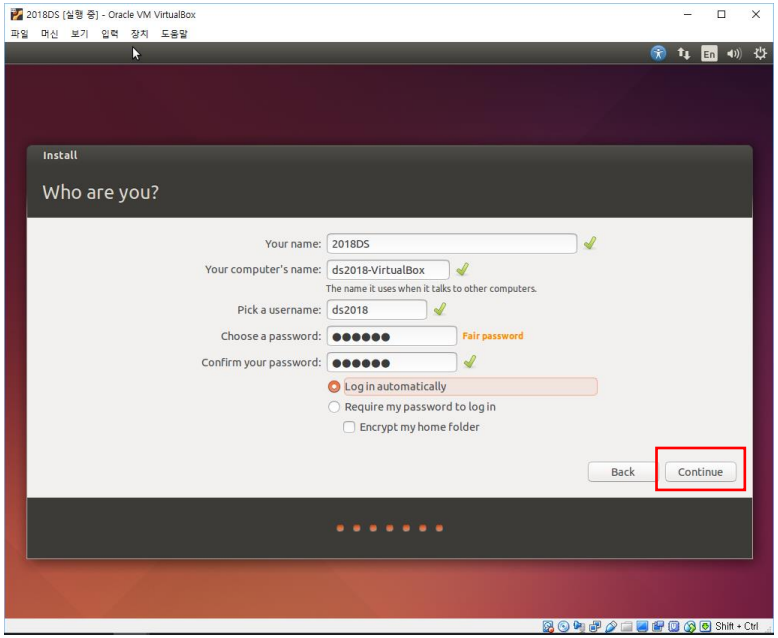
How to install Ubuntu



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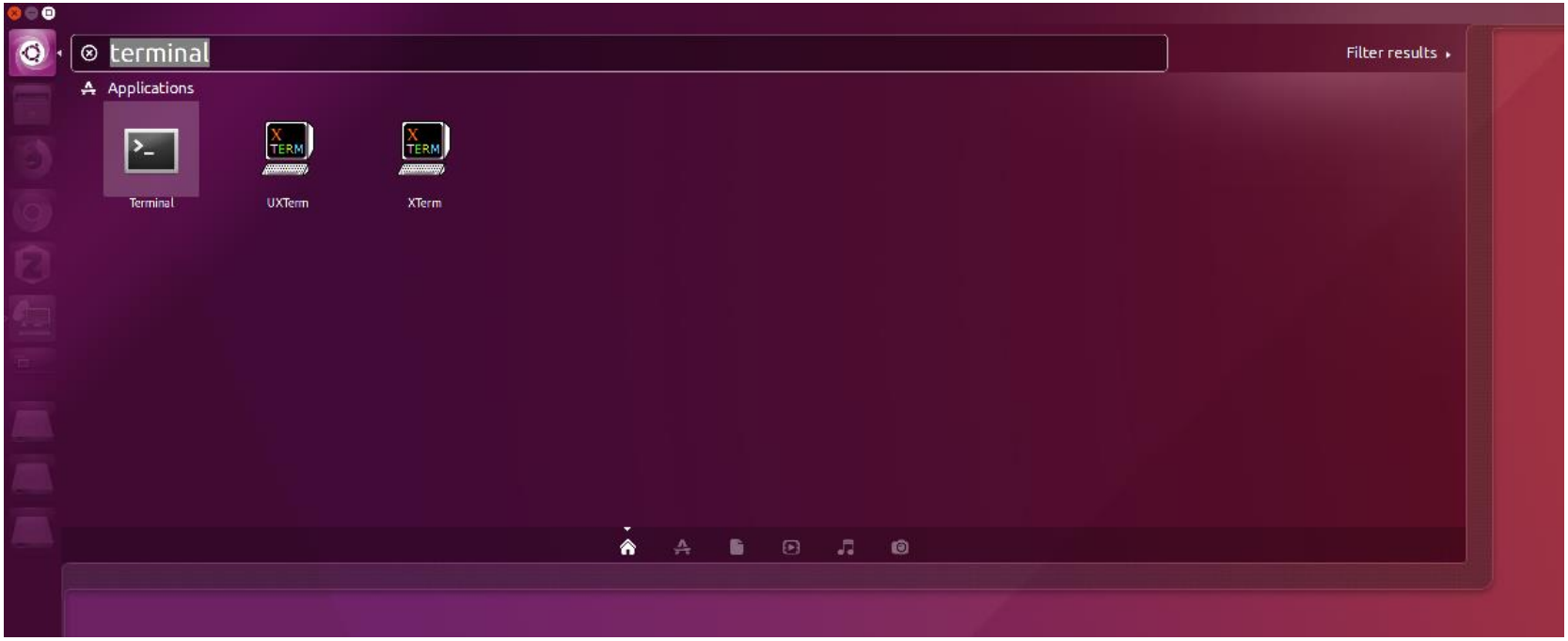
How to use Terminal

Launch a Terminal

- Click Dash button (Start button)
- Type “terminal” and click Terminal
- or use Shortcut: CTRL + ALT + T



How to use Terminal

- Retrieve file on current directory

(Shell – home directory)

```
$ ls
```

- Current Location

(Shell – home directory)

```
$ pwd
/home/<user>                    # this is your Home Directory
```

How to use Terminal

- Directory type
  - Normal directory : <dir-name>
  - Current directory : .
  - Parent directory : ..
  - Root directory : /
  - Home directory : ~
- Path type
  - Absolute address : /<dir1>/<dir2> ..
  - Relative address: : <dir1>/<dir2>

How to use Terminal

- Make directory

```(Shell)
$ mkdir <dir-name>
```

- Change (current working) directory

```(Shell)
$ cd <destination directory>
```

- Remove file, directory

```(Shell)
$ rm <file-name>
```

```(Shell)
$ rm -rf <dir-name>
```

How to use Terminal

- Move source(s) to destination directory.

```
(Shell)
$ mv <source file> <destination directory>
```

```
(Shell)
$ mv <source directory> <destination directory>
```

- Rename SOURCE to DEST

```
(Shell)
$ mv <SOURCE> <DEST>
```

How to use Terminal

- Copy

(Shell)

```
$ cp <source file> <destination directory>
```

(Shell)

```
$ cp <source file> <destination file>
```

(Shell)

```
$ cp –r <source directory> <destination directory>
```

Other Commands

- **“cat {file_name}” : Print file contents**
- **“vi {file_name}” : Edit the file with vi editor (if the file does not exist, create it)**
- **“gedit {file_name}” : Edit the file with gedit editor (if the file does not exist, create it)**

Examples

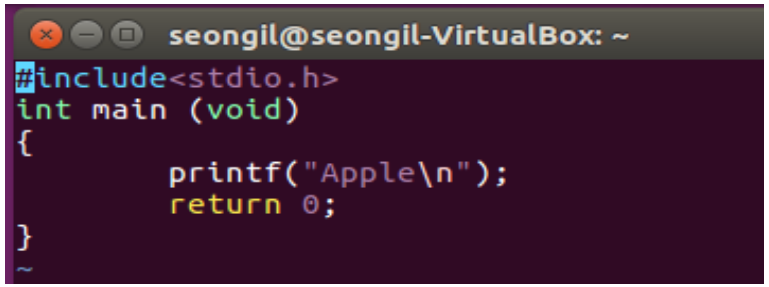
- **ls**

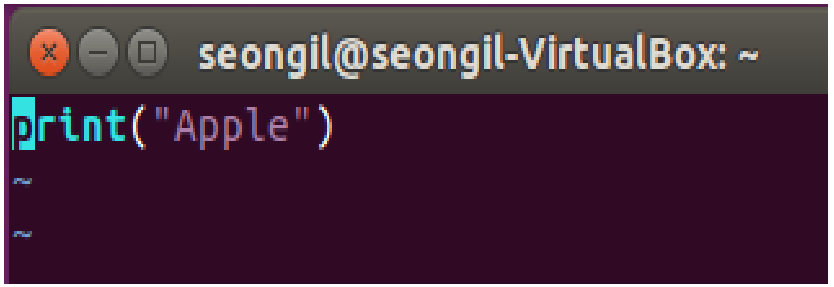
```
seongil@seongil-VirtualBox:~$ ls
Desktop     Downloads          Music     Public   Templates  test.c
Documents   examples.desktop   Pictures  seongil  test       Videos
```

- **cat**

```
seongil@seongil-VirtualBox:~$ cat test.c
#include<stdio.h>
int main (void)
{
        printf("Apple\n");
        return 0;
}
```

- **vi test.c, vi test.py**





Vim Basic Usage

Vim

- **V**i **IM**proved

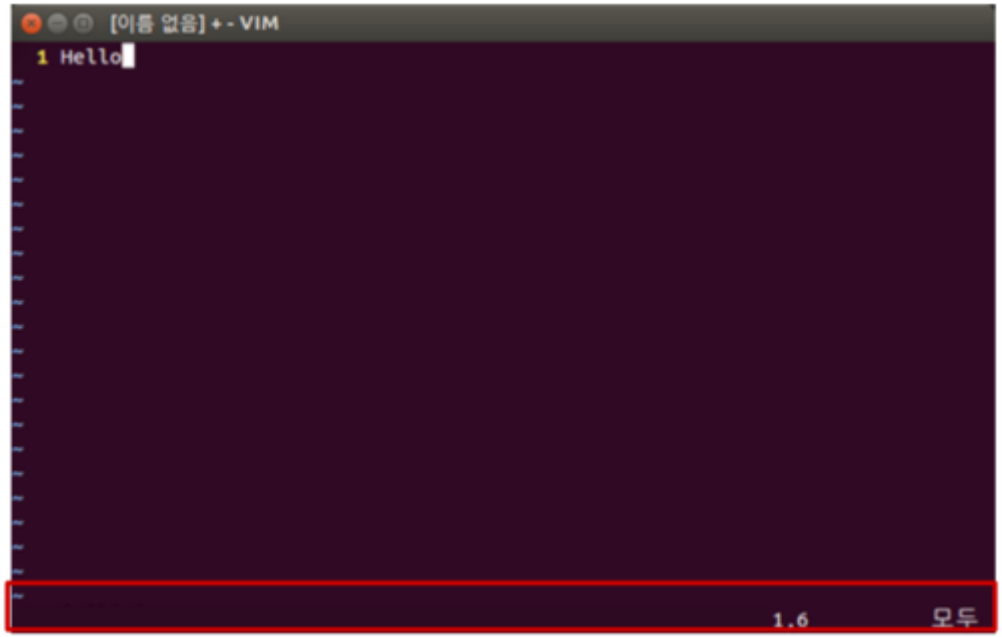
- An editor with many improvements to the existing Vi editor (first released in 1991 by Bram Moolenaar)
  - Vi is created in 1976 by Bill Joy, a key developer of BSD
  - Vim is used much more now.

- Vim is a default editor in most Linux systems.
  - Knowing how to use Vim is a great way to work on Linux.

- Three modes in Vim:
  - Normal mode
  - Insert mode
  - Command-line mode

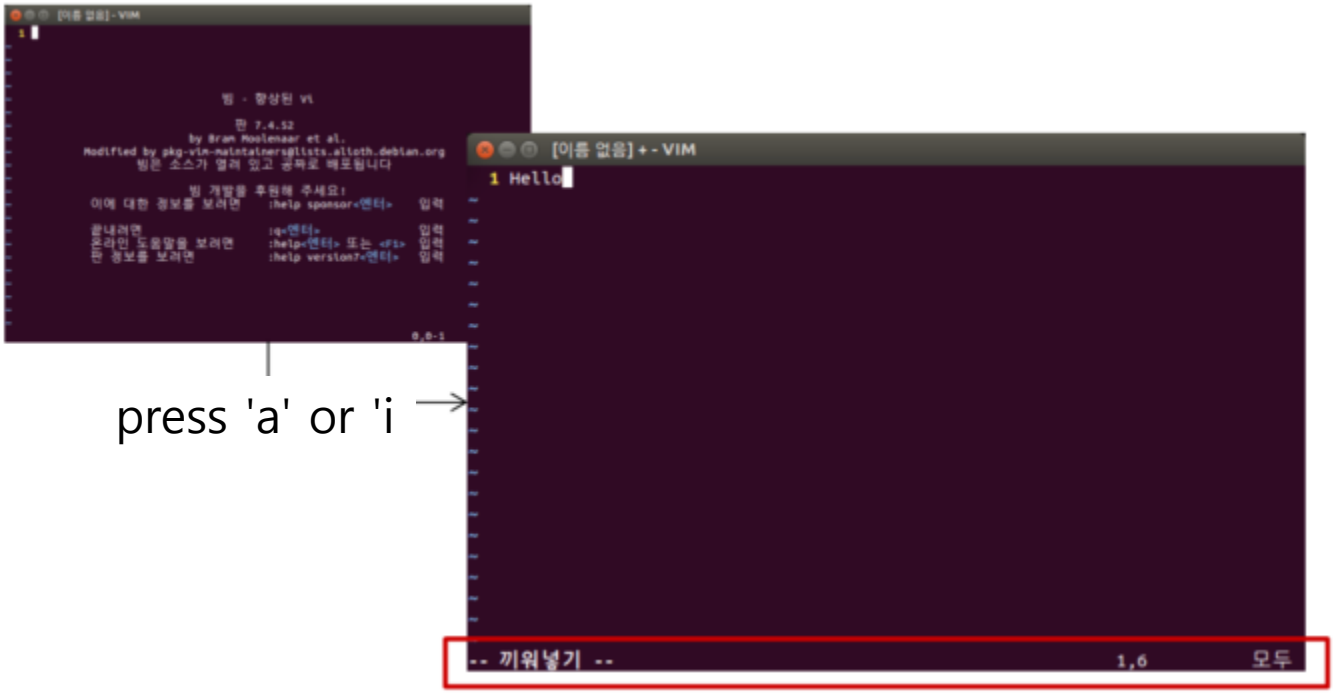
Normal Mode

- Vim starts in Normal mode.
- Copy, paste, delete, search and other functions are available through shortcut keys.
- In this mode, vim is waiting for your command shortcut.



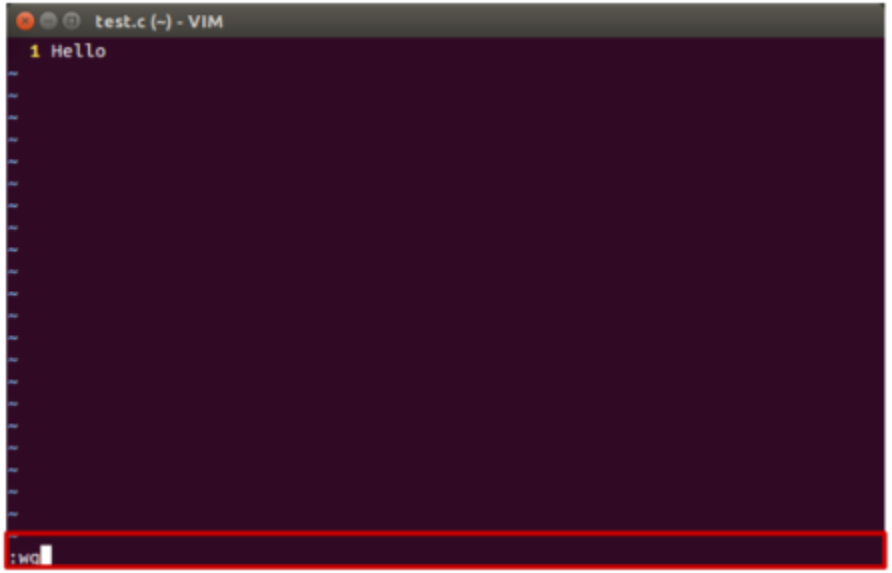
Insert Mode

- Press **a** or **i** in Normal mode to enter Insert mode.
- In this mode, you can enter and edit a file as you would in a general text editor.
- Press **ESC** to return to Normal mode.



Command-line Mode

- Press **:** in Normal mode to enter Command-line mode.
- In this mode, you can enter commands on the command line in vim.
  - w : save
  - q : quit
  - ! : "force" something (ex : wq! , q!: force save, force quit)
- Press **ESC** to return to Normal mode.



References for Vim Basic Usage

- Vimtutor: A tutorial included in vim

(Shell)

```
vimtutor
```

- Additional tutorials:
  - Interactive Vim tutorial
    http://www.openvim.com/tutorial.html

References for Vim Commands

- Vim Cheat Sheet : https://vim.rtorr.com/lang/ko/

- :help <command> : help document for the command

Vim Cursor Movement Commands

vim - movement commands

https://bytebucket.org/tednaleid/vim-shortcut-wallpaper/raw/6f25ec82f84640e991a08345e6a28ec12f1d16a2/vim-shortcuts.png

Vim Advanced Usage

- In the supplementary material *1-Lab1-reference-VimAdvanced.pdf*, you can find how to use:
  - Shell settings for convenient vim use
  - .vimrc - vim configuration file
  - Vim visual mode
  - Vim windows
  - Vim plug-ins
  - Vim color schemes

Next Topic (Today)

- You need to complete the environment setup and become familiar with the basic usage of vim for labs after today.

- Now, let's move on to the next topic - *1 - Lab2 - g++, make, gdb*