Creative Software Design

1 - Lab1 - Environment Setting, Vim

Yoonsang Lee
Fall 2023

Introduction

- Lab1 TA: Bokyeong Jang (장보경)
  - alswl7763@hanyang.ac.kr

- Lab1 Undergraduate Mentor: Hauk Nam (남하욱)

Outline

- 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, you use virtual machine.
  - http://www.virtualbox.org/
  - https://www.oracle.com/virtualization/technologies/vm/downloads/virtualbox-downloads.html

- Ubuntu: Ubuntu 22.04 is recommended.
  - http://releases.ubuntu.com/22.04

- Editor: Vim is recommended.

Development Environment in This Class (for M1, M2)

- If using Arm-based MacBooks (M1, M2), use UTM instead of virtualbox.
  - https://docs.getutm.app/installation/macos/
  - (click download from github)

- Ubuntu: Ubuntu 22.04 is recommended. Download ubuntu image for Arm.
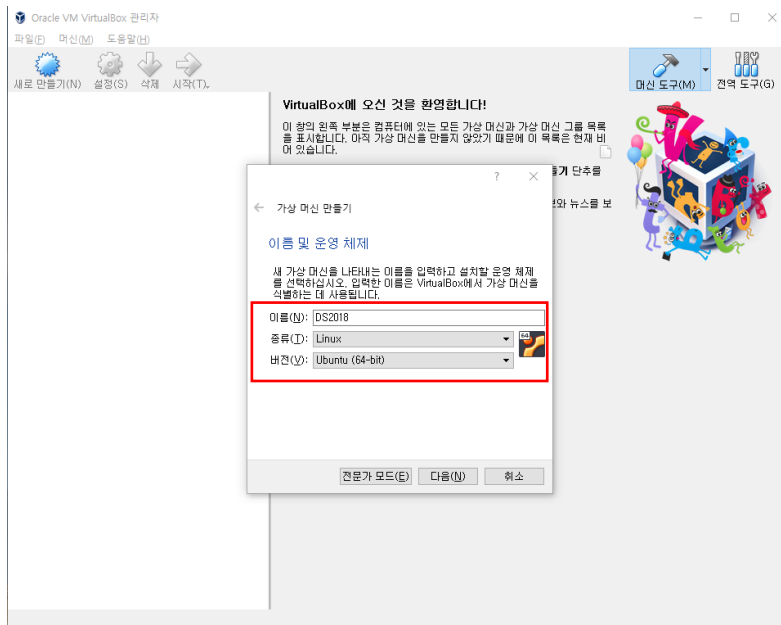 - https://ubuntu.com/download/server/arm

- 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.

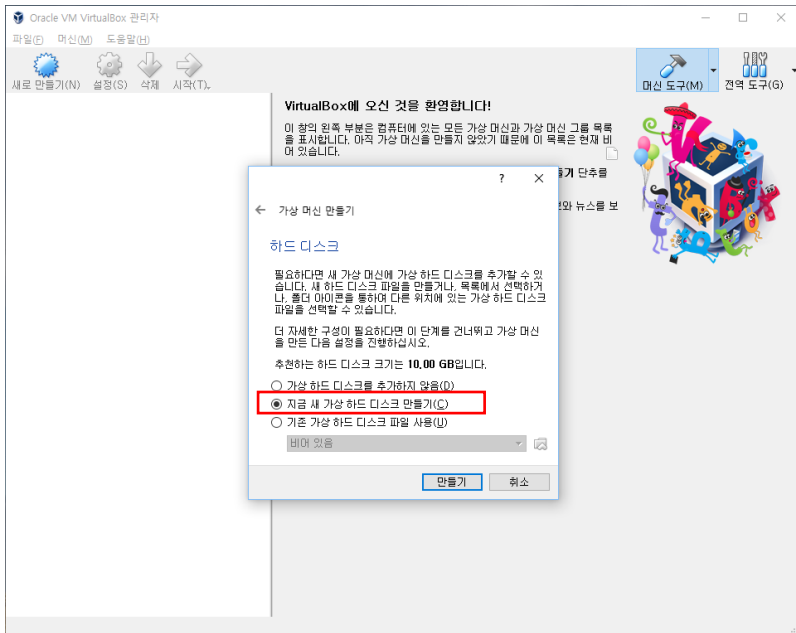# How to install Ubuntu

- Name : (any name you want)

- Type : Linux

- Version : Ubuntu (64-bit)
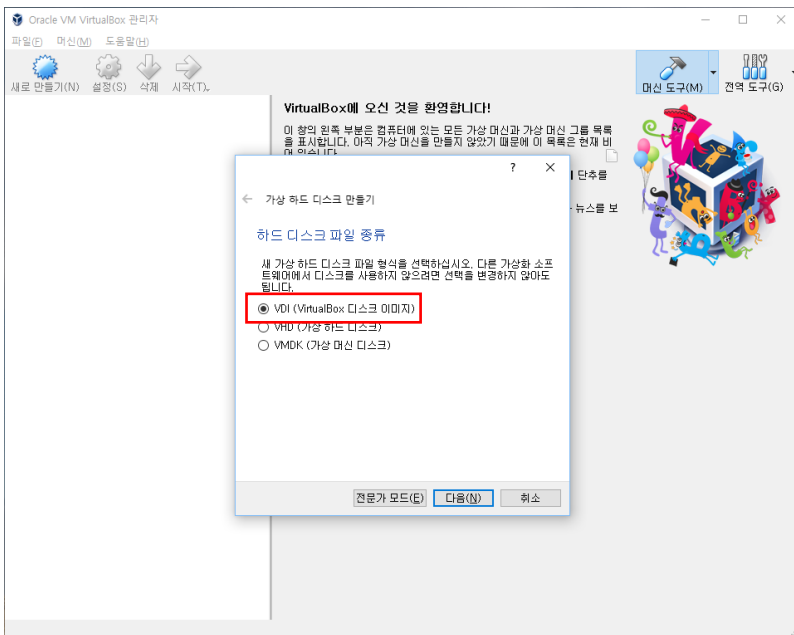
How to install Ubuntu
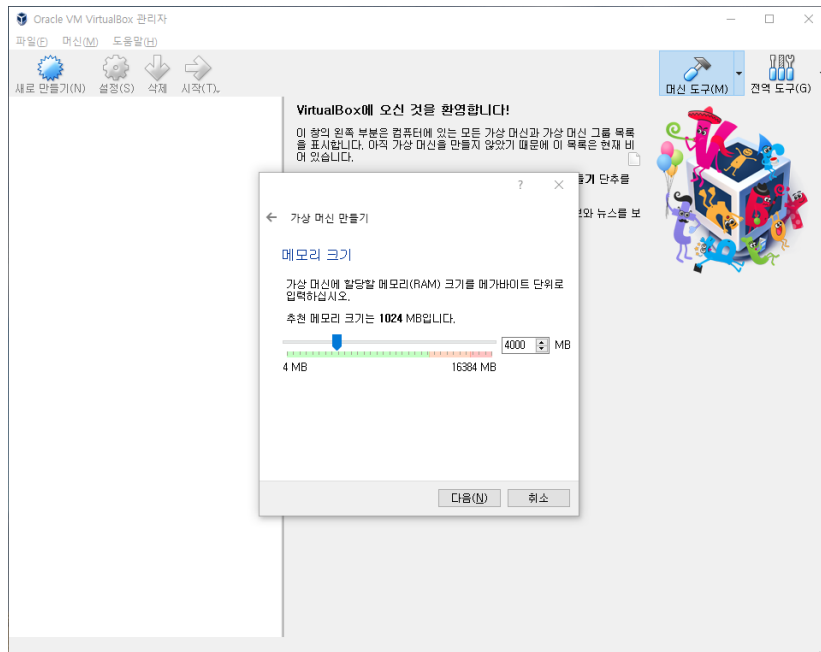
- Memory size : (any size)

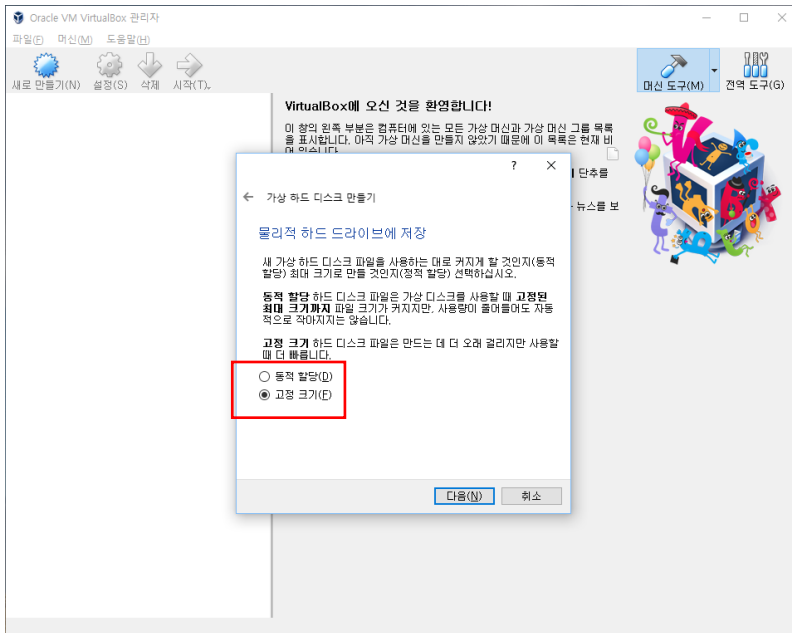# How to install Ubuntu

- Create a virtual hard disk
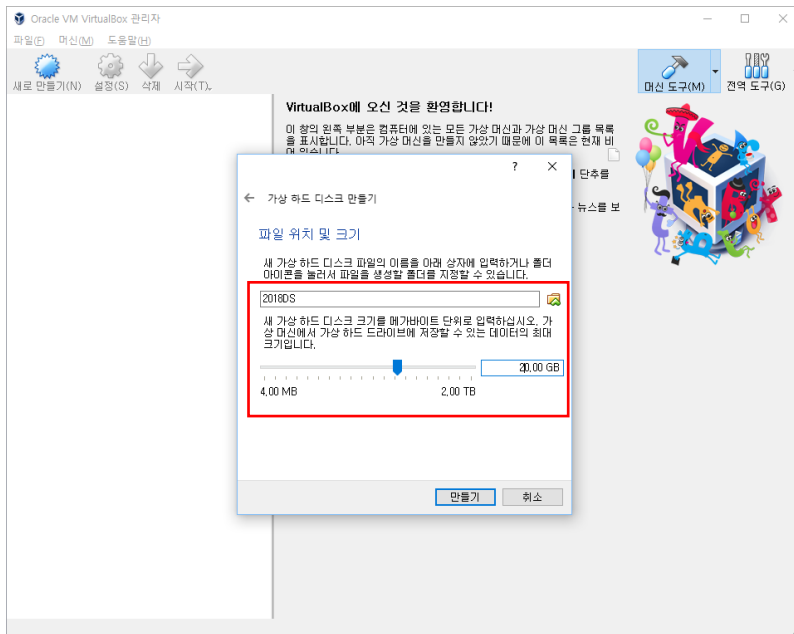
How to install Ubuntu
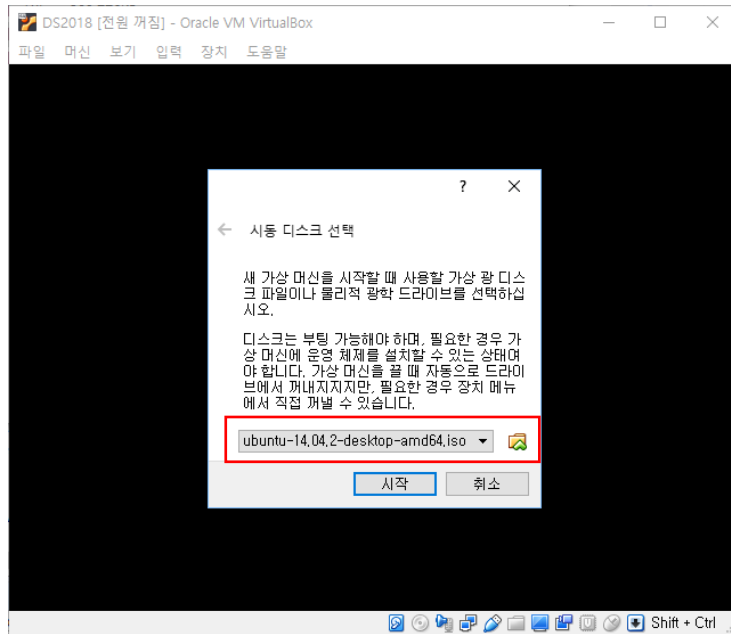

- VDI

How to install Ubuntu

- Recommendation: Fixed size

How to install Ubuntu

- Virtual disk file location & size:

- any location you want
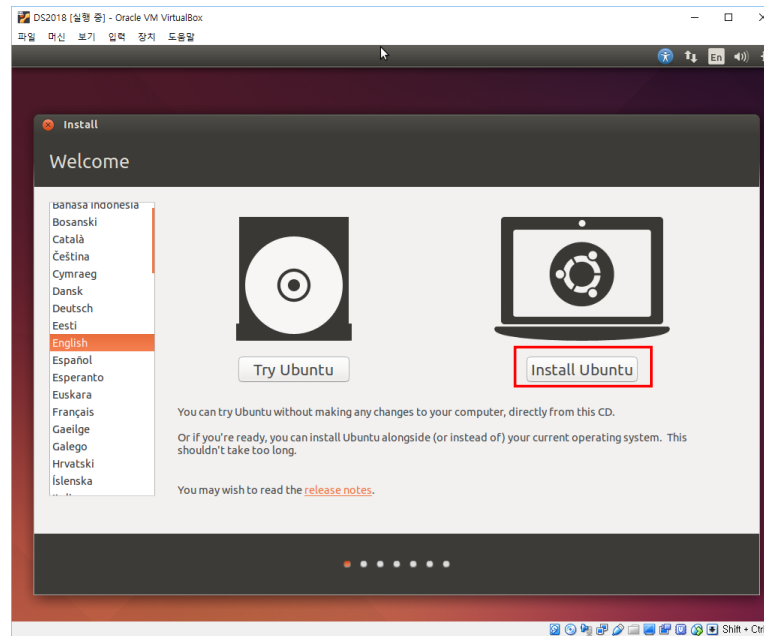
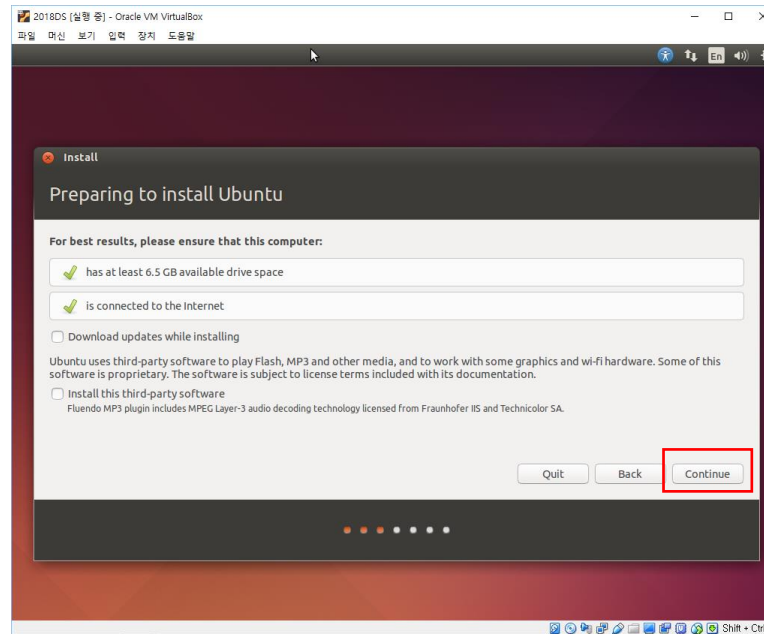- any size you want (e.g. 20GB)

How to install Ubuntu

- Choose the downloaded

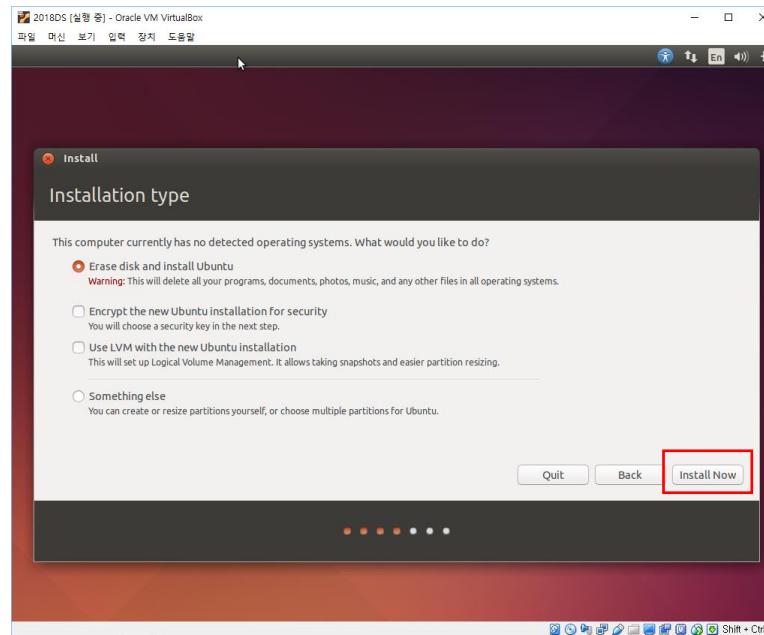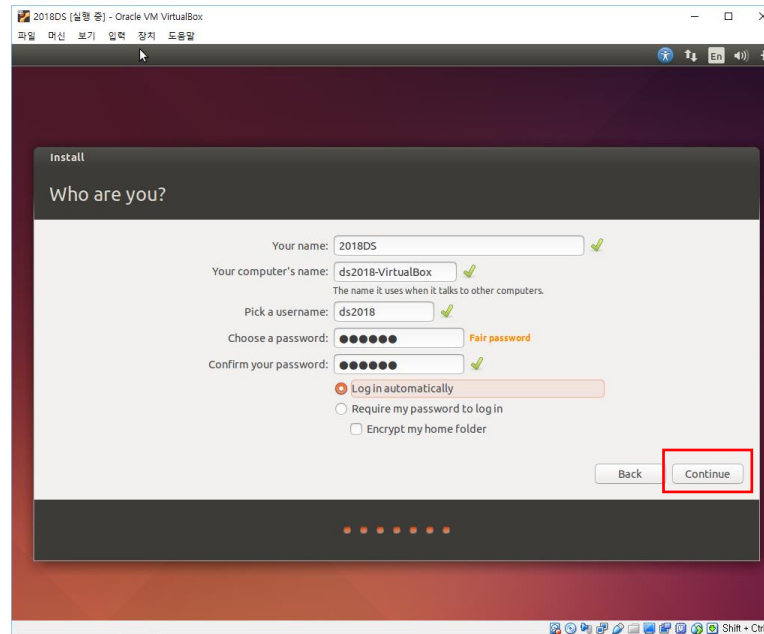   Ubuntu .iso file as a boot disk

How to install Ubuntu

How to install Ubuntu

How to install Ubuntu

How to install Ubuntu
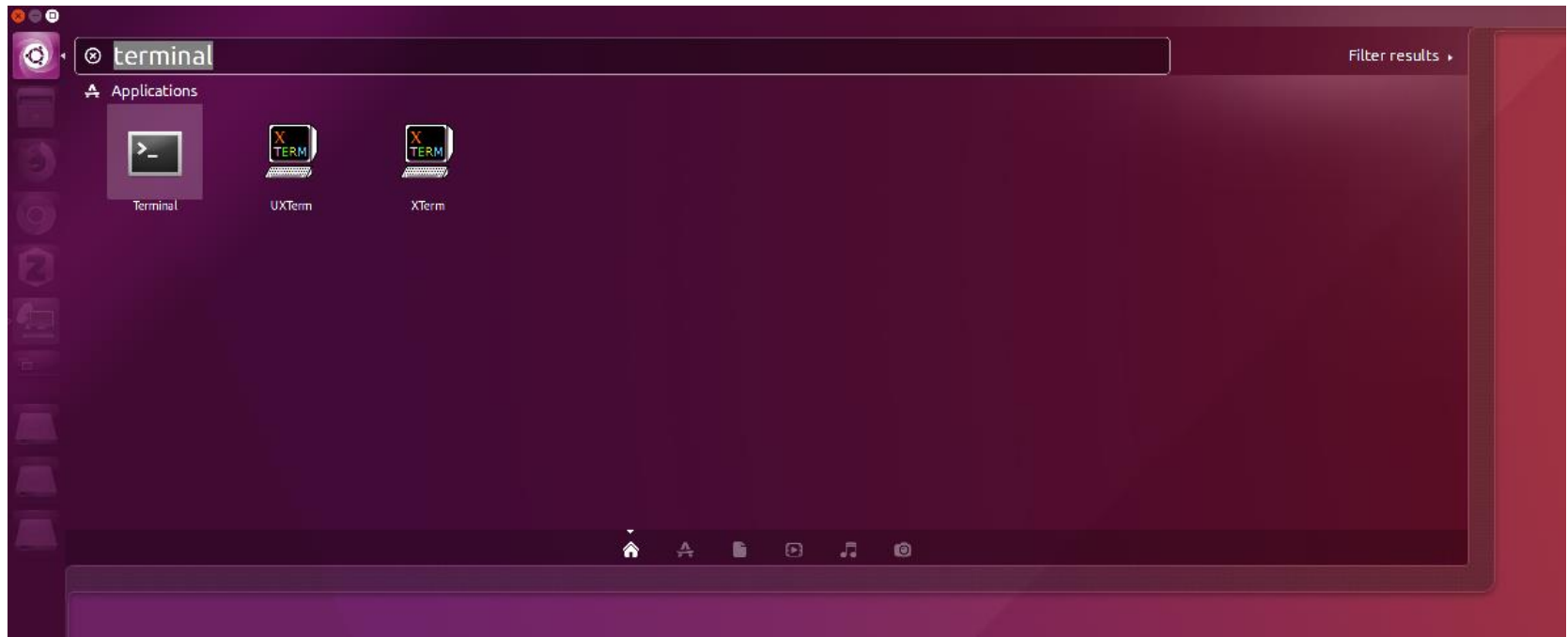
How to use Terminal

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**

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

```
seongil@seongil-VirtualBox: ~
print("Apple")
~
~
```

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
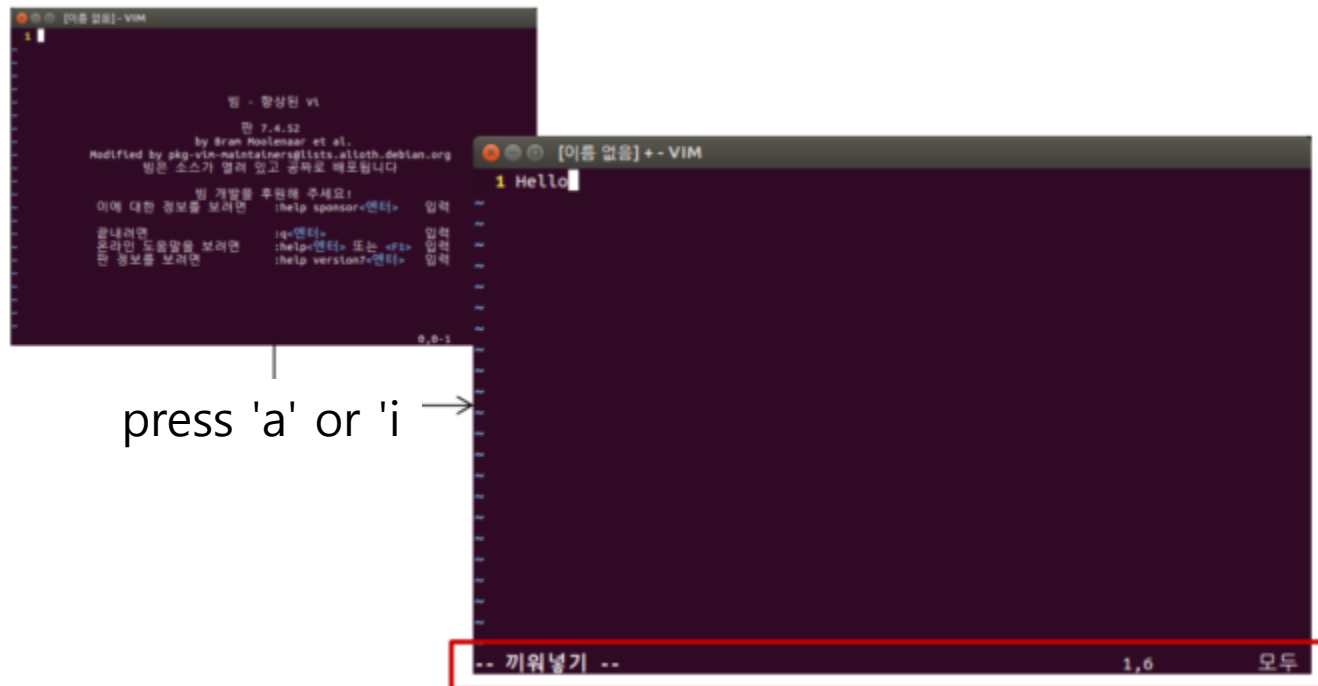 - Command-line mode

Normal Mode

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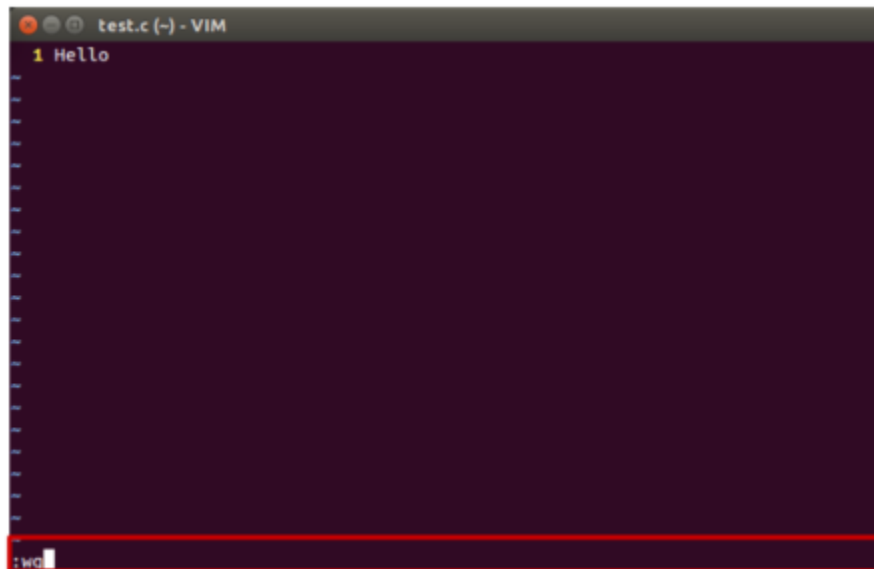- In this mode, vim is waiting for your command shortcut.
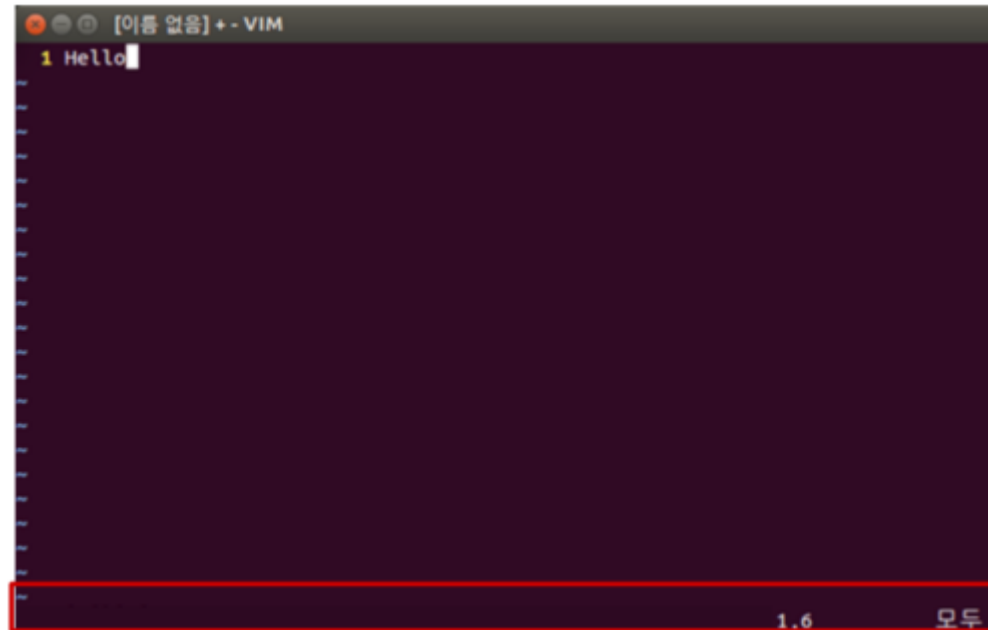
Insert Mode

- 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.

press 'a' or 'i' →

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

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

Vim Advanced Usage

- In the supplementary material *1 - Lab1 - Reference - Vim Advanced.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 Lab (Tomorrow)

- Tomorrow, you'll have the first assignment that requires you to write a simple C programs.

- Therefore, please complete the environment setup and become familiar with the basic usage of vim before the lab tomorrow.