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# **Creative Software Design**

## **1 - Lab1 - Environment Setting**

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Fall 2020

# Topic Covered

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

# Today's Lab

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- 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

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- (If you're using OS other than Ubuntu) Use virtual machine: <http://www.virtualbox.org/>
- Ubuntu: Ubuntu 20.04 is recommended.
  - <http://releases.ubuntu.com/20.04>
- Editor: Vim is recommended.

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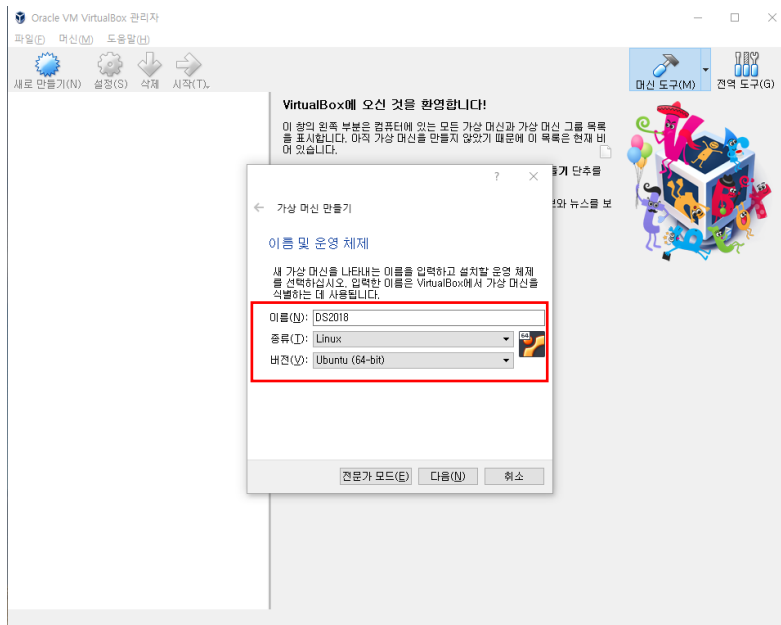
# **Install Ubuntu**

# Install Ubuntu in Virtual Box

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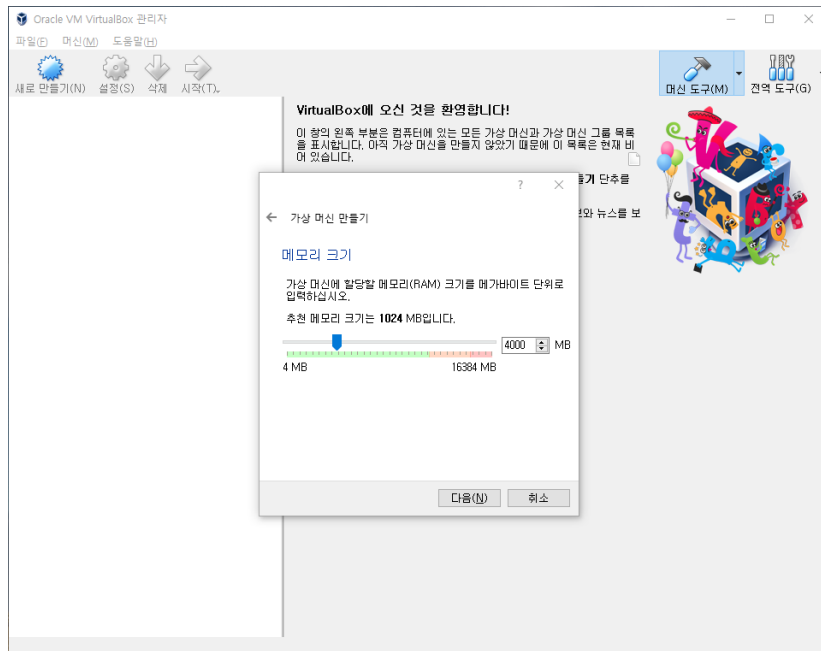
- If you're using a computer with Ubuntu installed, you can use it as is.
- Following slides assume you're using other OSs.

# How to install Ubuntu



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

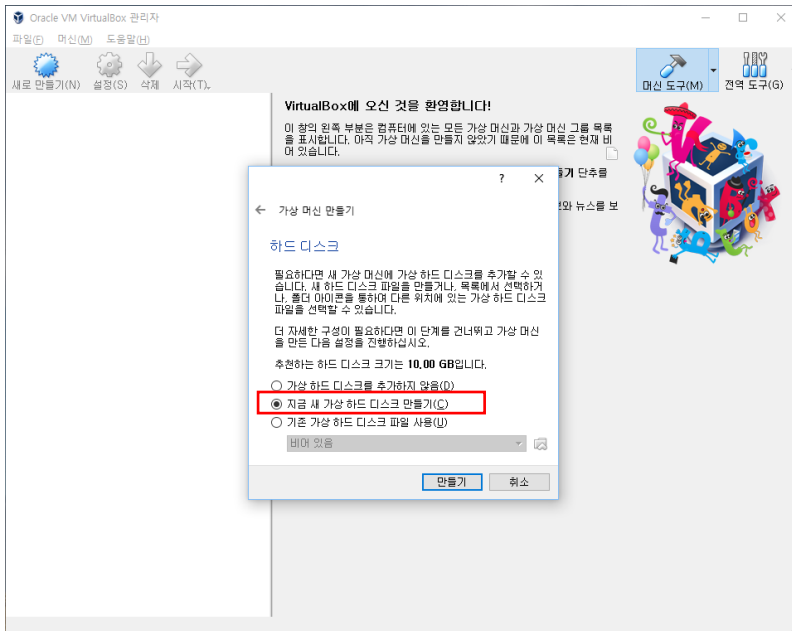
# How to install Ubuntu



- Memory size : (any size)

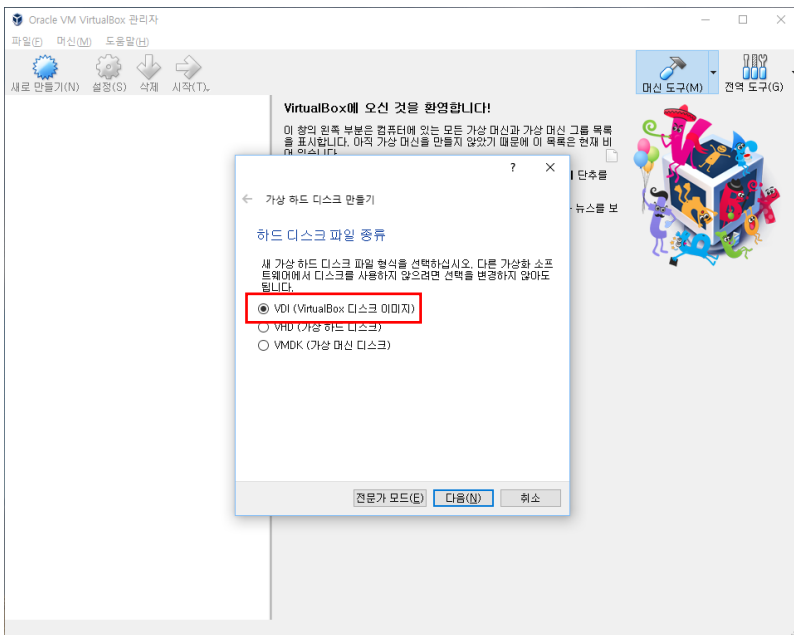


# How to install Ubuntu



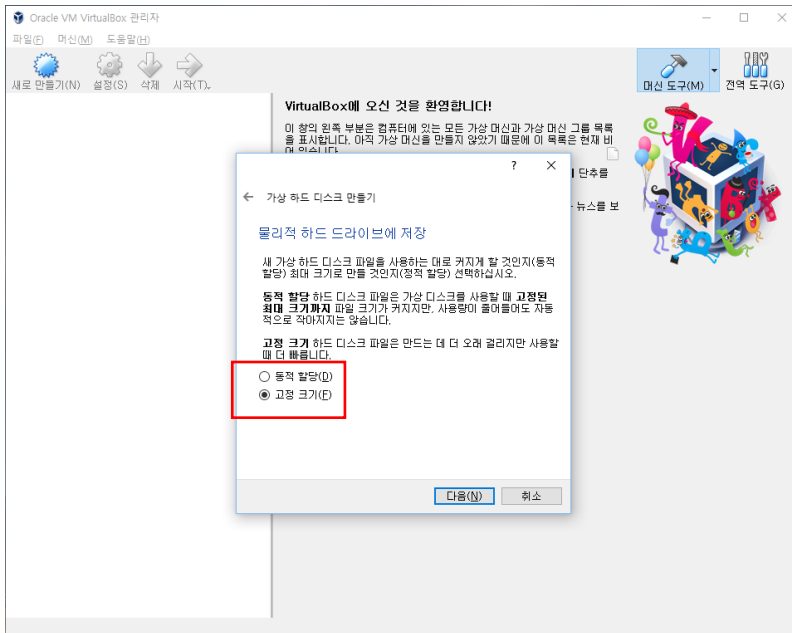
- Create a virtual hard disk

# How to install Ubuntu



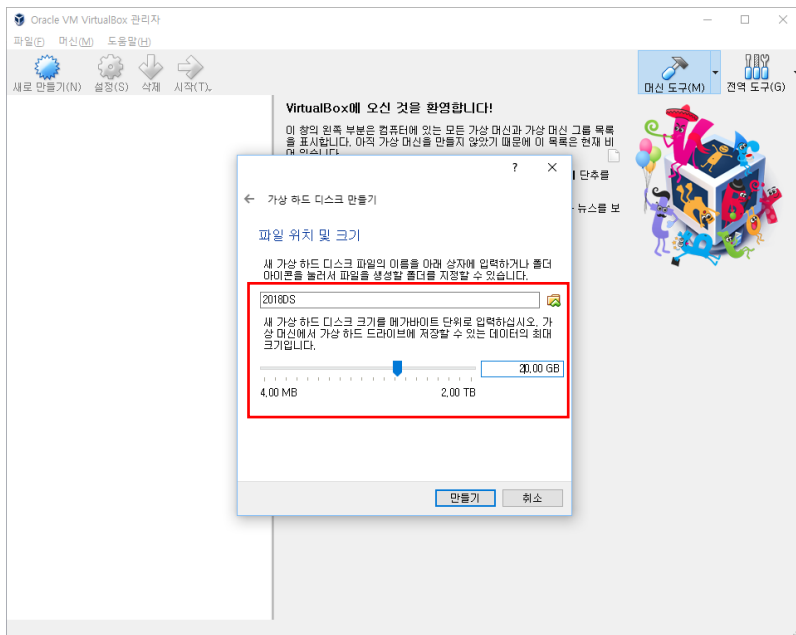
- VDI

# How to install Ubuntu



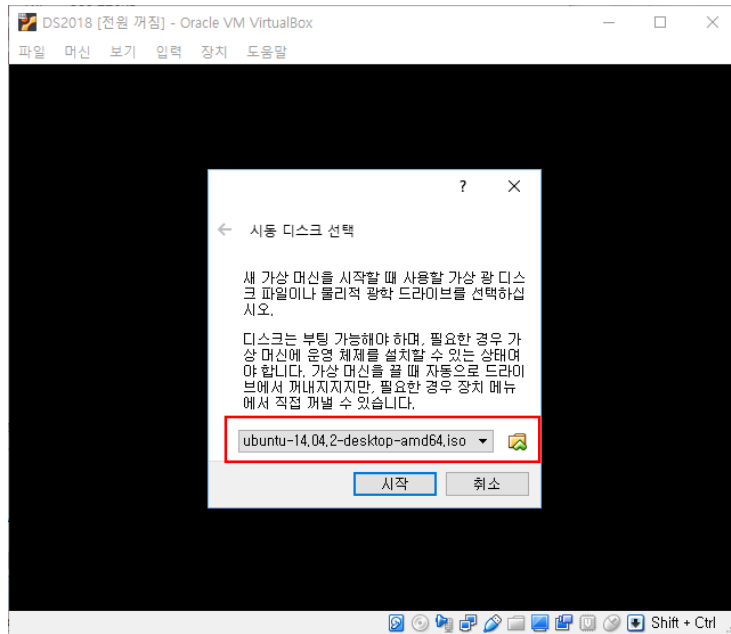
- Recommendation: Fixed size

# How to install Ubuntu



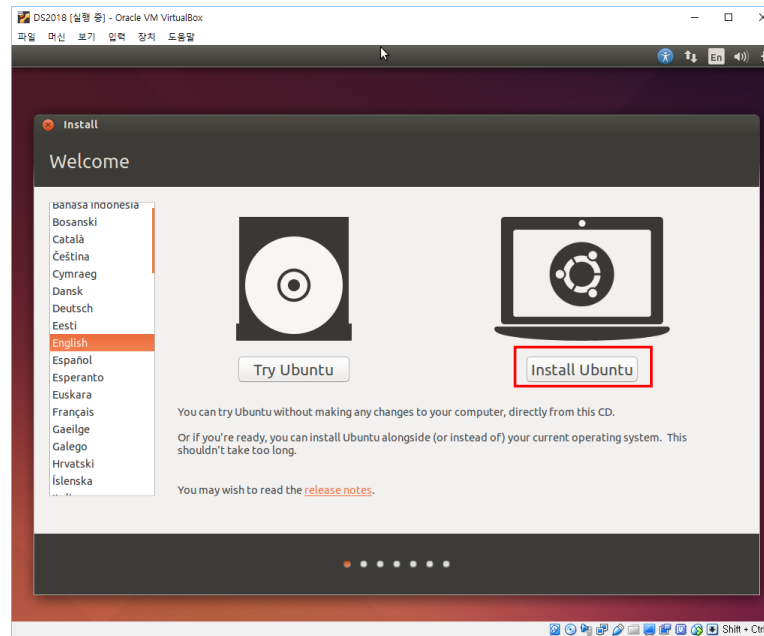
- Virtual disk file location & size:
- any location you want
- any size you want (e.g. 20GB)

# How to install Ubuntu

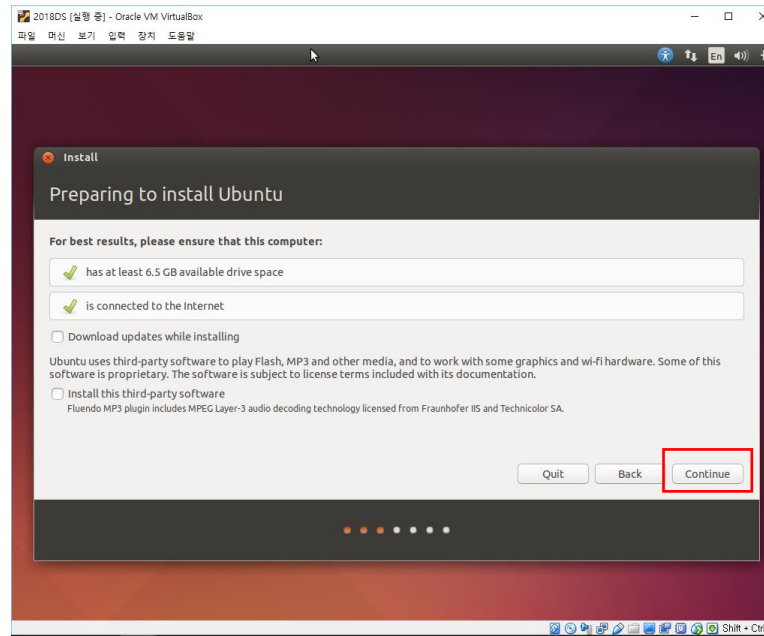


- Choose the downloaded Ubuntu .iso file as a boot disk

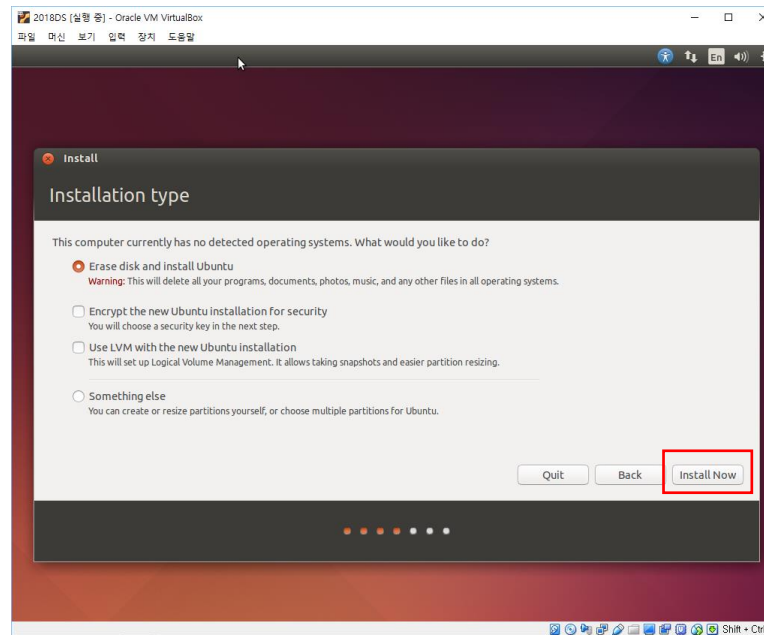
# How to install Ubuntu



# How to install Ubuntu

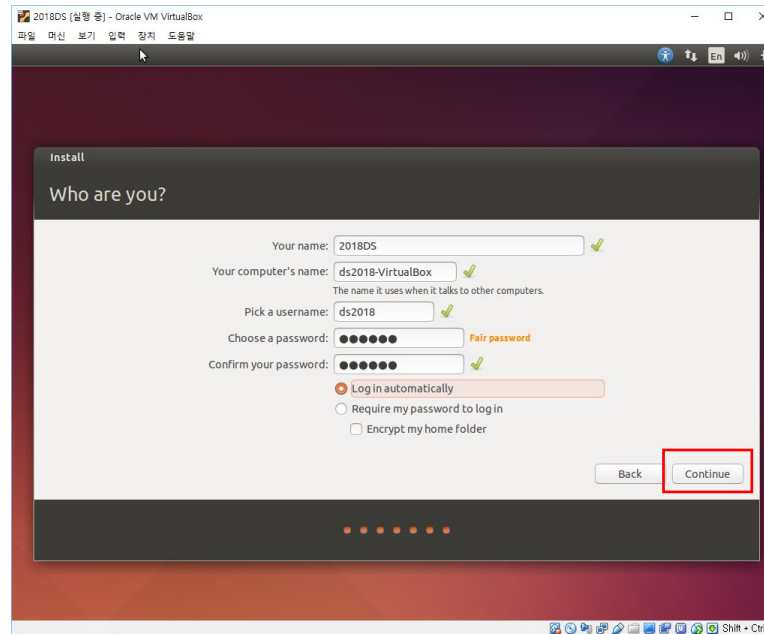


# How to install Ubuntu





# How to install Ubuntu

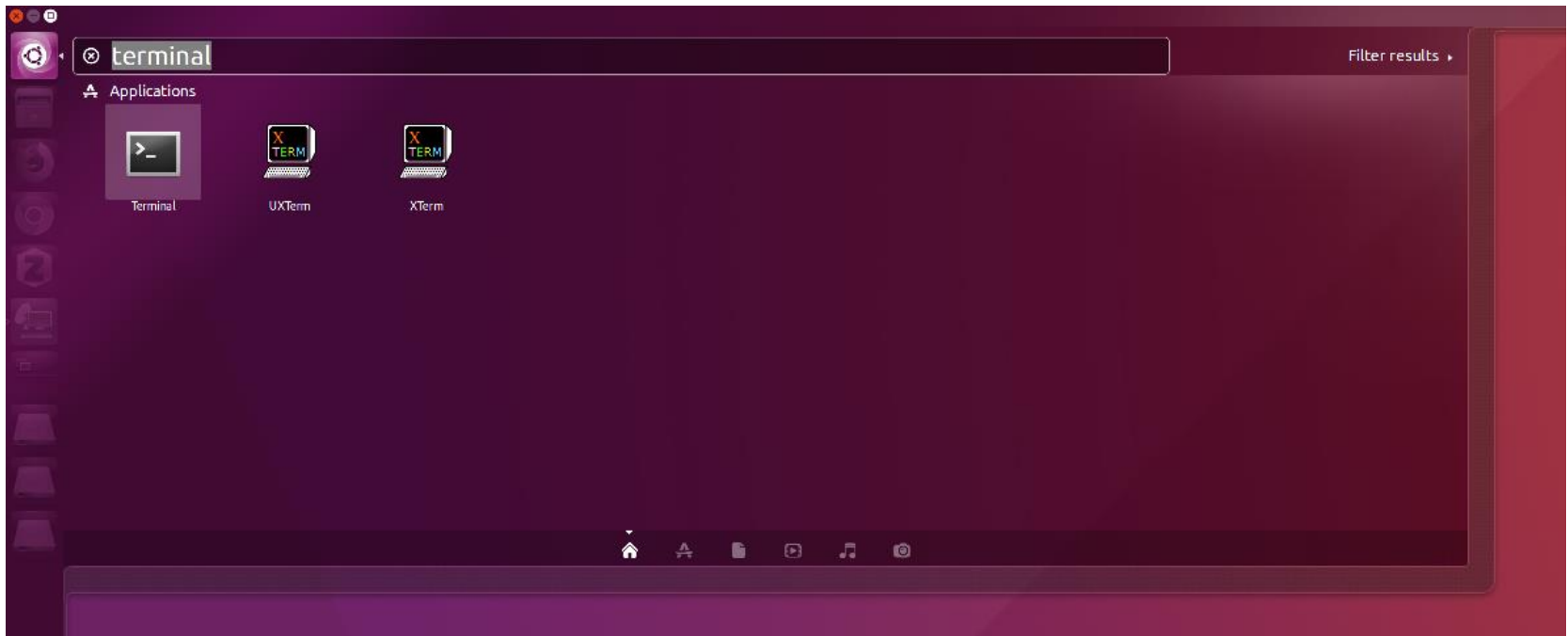


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# **How to use Terminal**

# Launch a Terminal

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



# How to use Terminal

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- 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

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- 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

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- 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

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- 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

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- 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")
```

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# Vim Basic Usage

# Vim

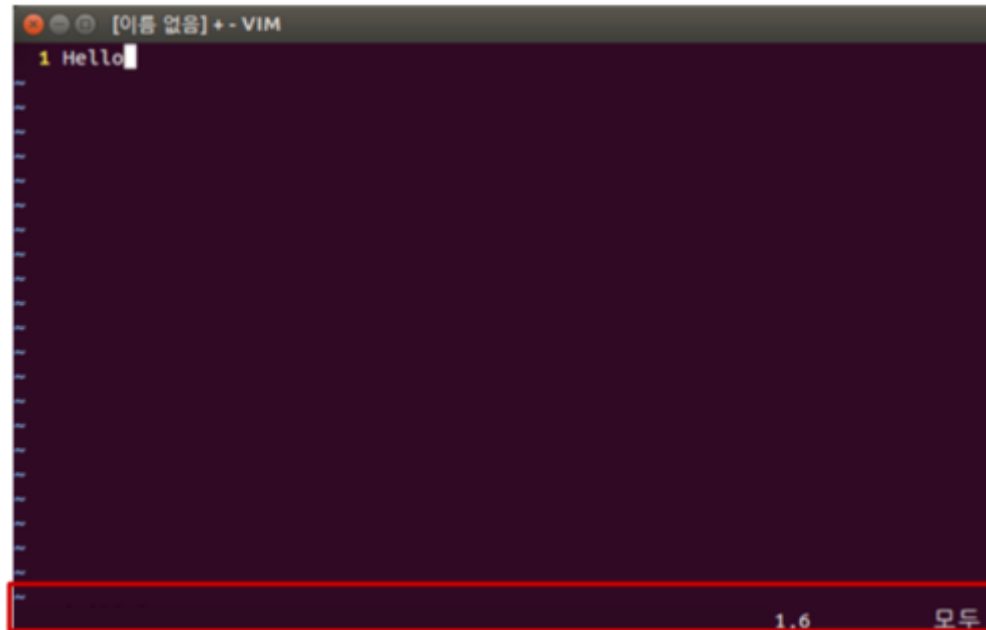


- **Vi IMproved**
- An editor with many improvements to the existing Vi editor (first released in 1991 by Bram Moolenaar)
  - Vi is created in 1976 by Bill Joy, a key developer of BSD
  - Vim is used much more now.
- Vim is a default editor in most Linux systems.
  - Knowing how to use Vim is a great way to work on Linux.
- Three modes in Vim:
  - Normal mode
  - Insert mode
  - Command-line mode

# Normal Mode

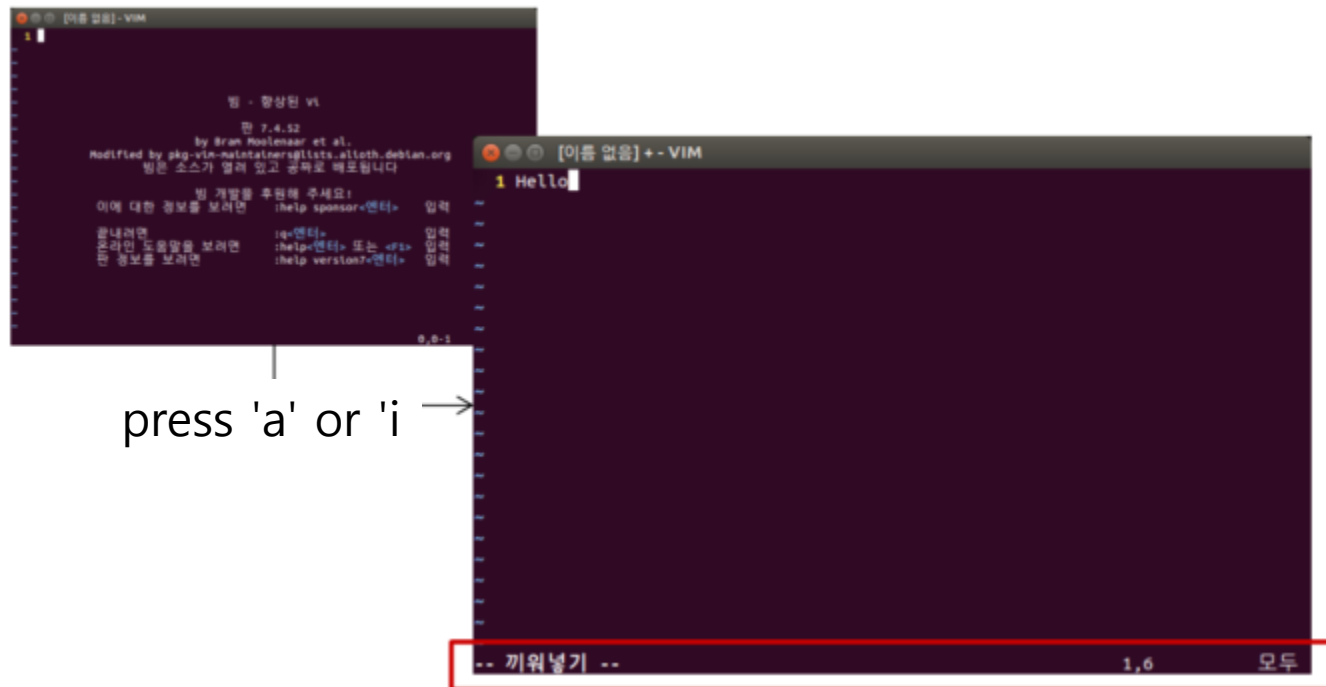
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- Vim starts in Normal mode.
- Copy, paste, delete, search and other functions are available through shortcut keys.
- In this mode, vim is waiting for your command shortcut.



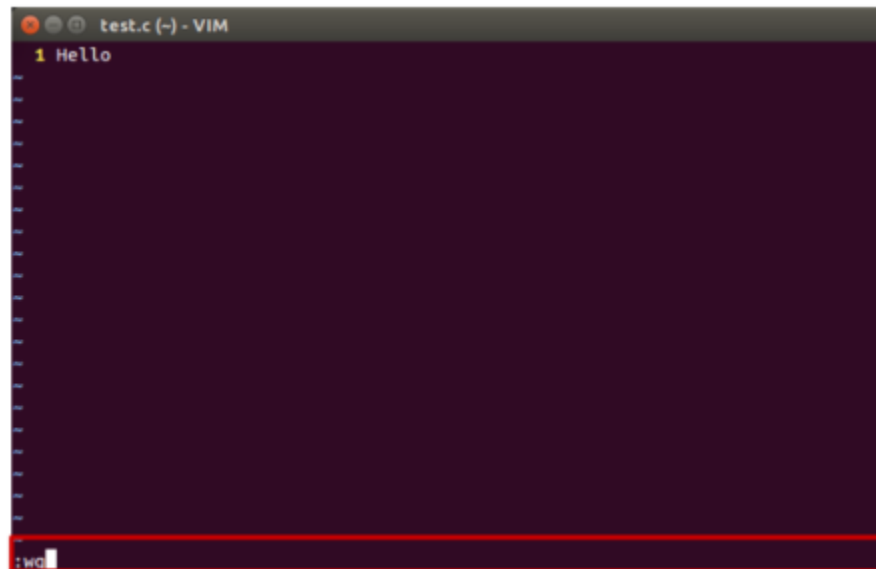
# Insert Mode

- 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.



The screenshot shows a terminal window titled "test.c (-) - VIM". The main area of the window contains the text "1 Hello" on the first line. At the bottom of the window, a red horizontal bar highlights the command-line prompt ":w", indicating that the user is in command-line mode and has entered the 'w' command to save the file.

# References for Vim Basic Usage

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- Vimtutor: A tutorial included in vim

(Shell)

```
vimtutor
```

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



# References for Vim Commands

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- Vim Cheat Sheet : <https://vim.rtorr.com/lang/ko/>
- `:help <command>` : help document for the command

# Vim Cursor Movement Commands

previous  
**gg**  
first line

**#** find word under cursor    **n** previous text    **?text** find text    **N** next text

**C-b** page    **C-u** 1/2 page

**H** screen

**{** paragraph    **(** sentence

**;** previous x    **B** delimited word    **gE** delimited end    **,** previous x

**O** line    **^** non-blank    **Fx** find x    **Tx** after x    **b** word    **ge** end    **h** left    **k** up    **l** right    **e** end    **w** word    **tx** before x    **fx** find x    **\$** line

**,** next x    **)** sentence    **}** paragraph    **E** delimited end    **W** delimited word    **;** next x

**L** screen

**C-d** 1/2 page    **C-f** page

**N** previous text    **/text** find text    **n** next text    **\*** find word under cursor

**G** last line next

back

forward

absolute movements

**''** last location    **'.** last edit    **#G** line #    **%** matching bracket



# Vim Advanced Usage

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- Shell settings for convenient vim use
- `.vimrc` - vim configuration file
- Vim visual mode
- Vim windows
- Vim plug-ins
- Vim color schemes
  
- For details, see the supplementary material: *1-Lab1-reference-VimAdvanced.pdf*

# Next Lab (Tomorrow)

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- 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.