Operating Systems

Practice 1.
Linux Installation

AI Software, Gachon University

Objective

- Linux installation
  - Using virtual machine on your computer
- Build the first program on Linux
  - Write basic C code on Linux environment
  - Build your own code
  - (optional) Get used to VI command

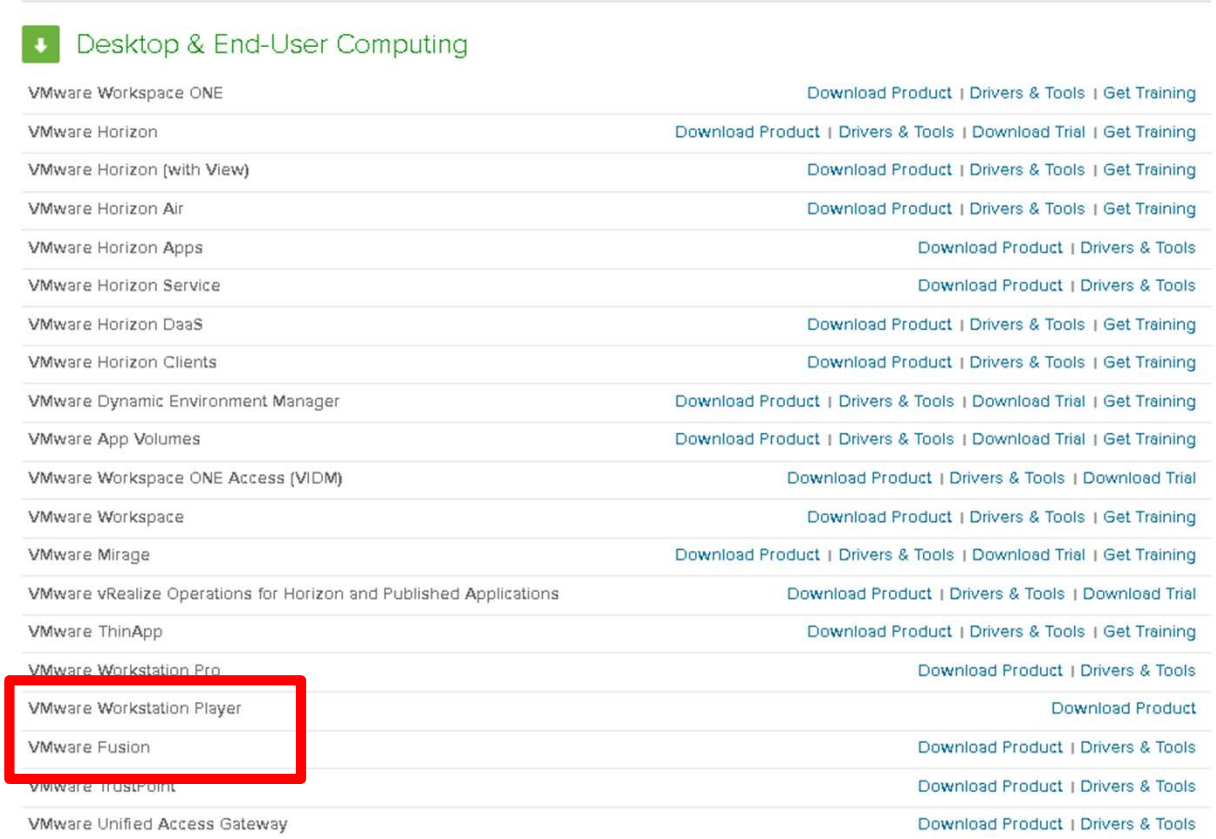
Linux Install

- Why Linux ?
  - It's free (GPL license)
  - All source codes are opened
  - Based on POSIX (compatible with UNIX system)

- Installation steps
  - Install VMware
  - Prepare Linux image (Ubuntu 18.04.4)
  - Install Linux on VMware

Install VMware

- VMware
  - https://www.vmware.com/kr.html
  - Choose workstation player (Windows) or Fusion (Mac)

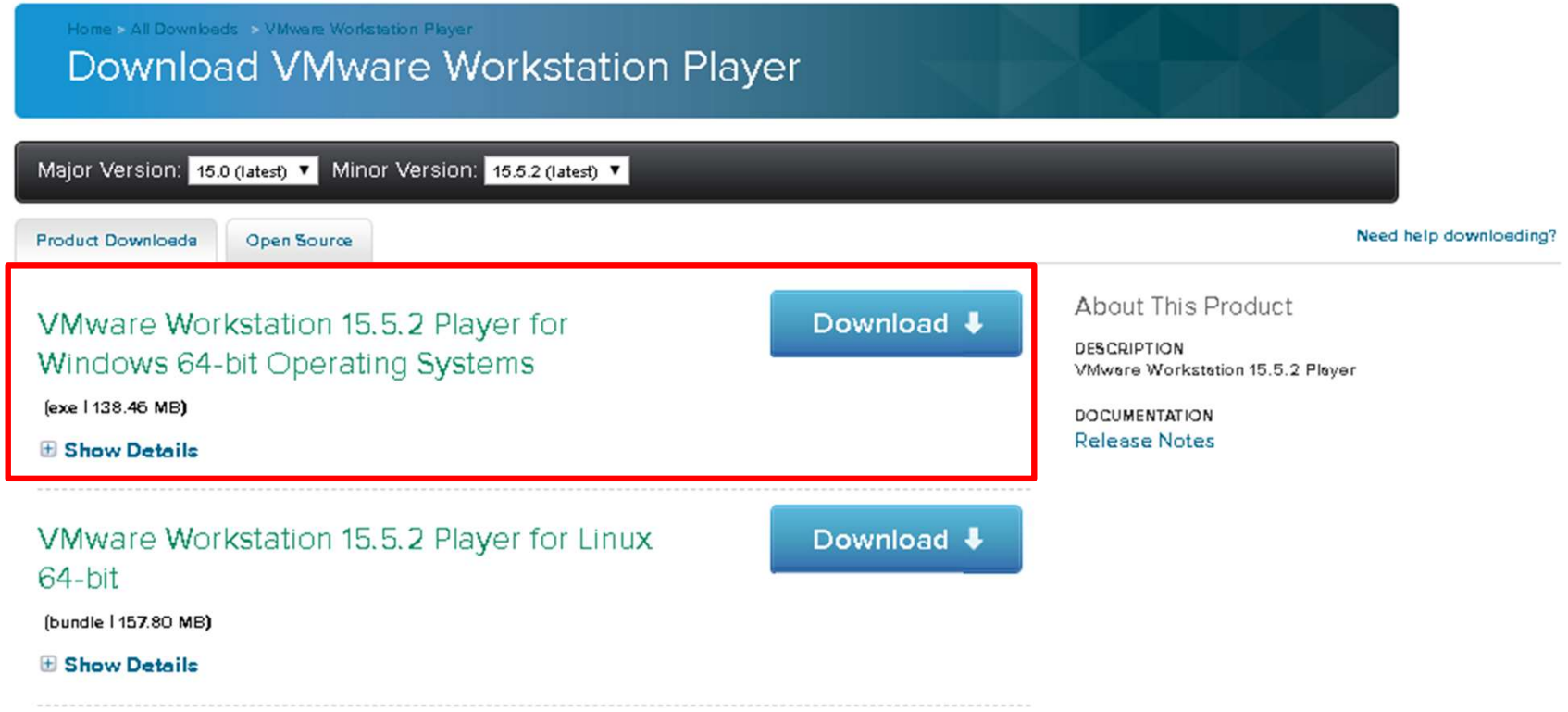


Desktop & End-User Computing

VMware Workspace ONE	Download Product | Drivers & Tools | Get Training
VMware Horizon	Download Product | Drivers & Tools | Download Trial | Get Training
VMware Horizon (with View)	Download Product | Drivers & Tools | Get Training
VMware Horizon Air	Download Product | Drivers & Tools | Get Training
VMware Horizon Apps	Download Product | Drivers & Tools
VMware Horizon Service	Download Product | Drivers & Tools
VMware Horizon DaaS	Download Product | Drivers & Tools | Get Training
VMware Horizon Clients	Download Product | Drivers & Tools | Get Training
VMware Dynamic Environment Manager	Download Product | Drivers & Tools | Download Trial | Get Training
VMware App Volumes	Download Product | Drivers & Tools | Download Trial | Get Training
VMware Workspace ONE Access (VIDM)	Download Product | Drivers & Tools | Download Trial
VMware Workspace	Download Product | Drivers & Tools | Get Training
VMware Mirage	Download Product | Drivers & Tools | Download Trial | Get Training
VMware vRealize Operations for Horizon and Published Applications	Download Product | Drivers & Tools | Download Trial
VMware ThinApp	Download Product | Drivers & Tools | Get Training
VMware Workstation Pro	Download Product | Drivers & Tools
VMware Workstation Player	Download Product
VMware Fusion	Download Product | Drivers & Tools
VMware TrustPoint	Download Product | Drivers & Tools
VMware Unified Access Gateway	Download Product | Drivers & Tools

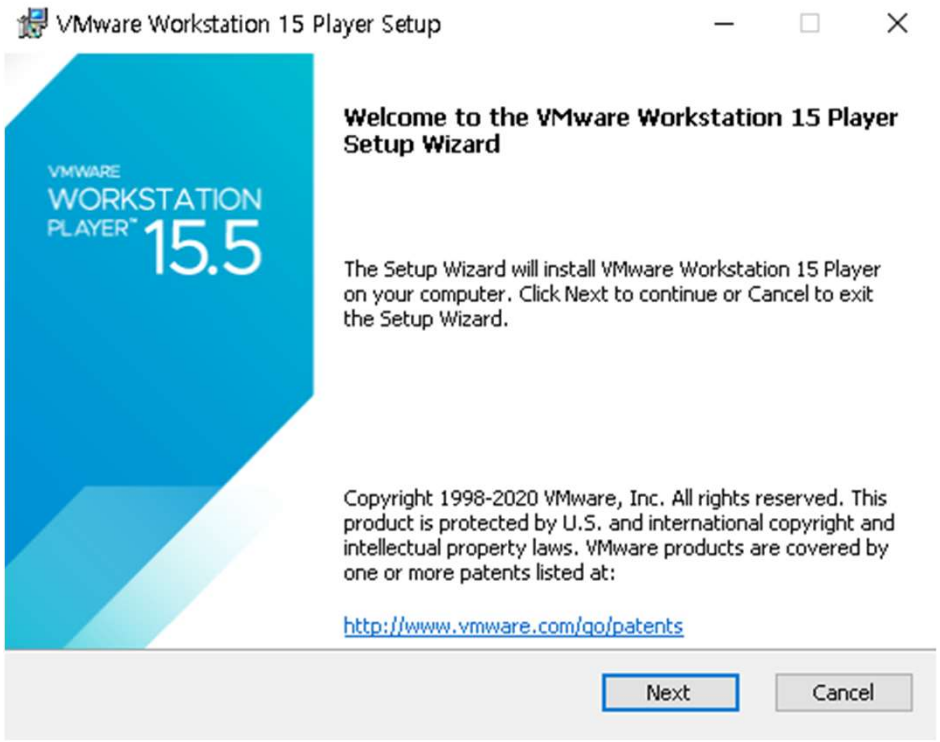
Install VMware

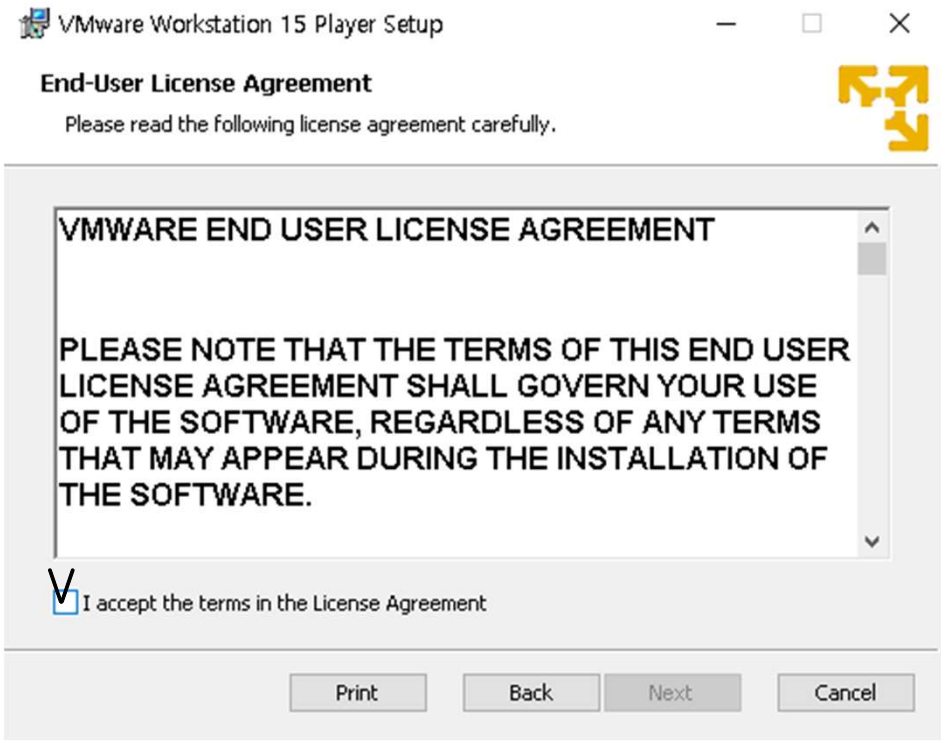
- VMware
  - VMware Workstation for Windows…



Install VMware

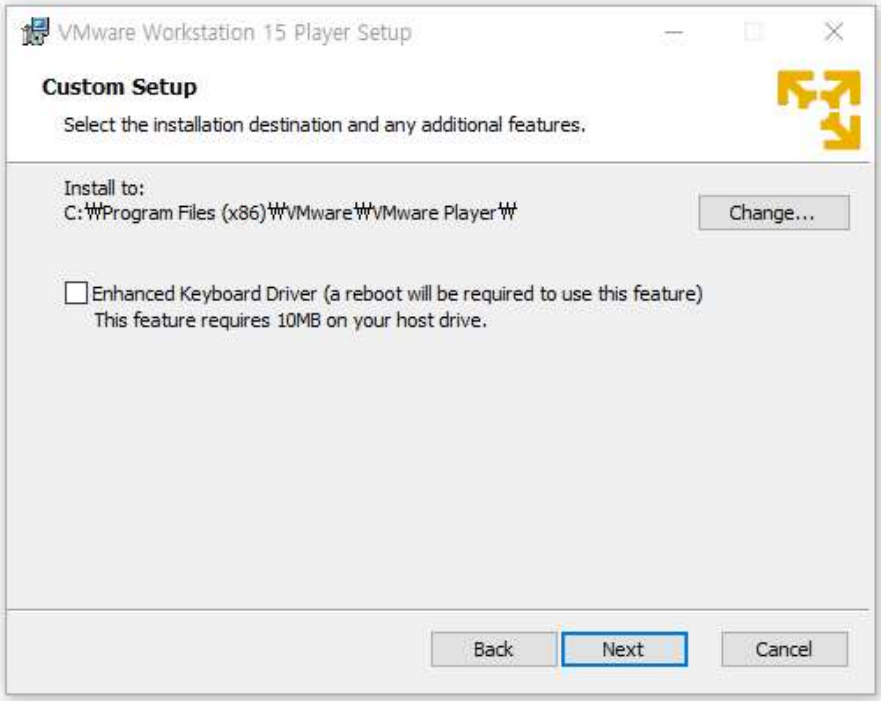
- VMware
  - follow instructions

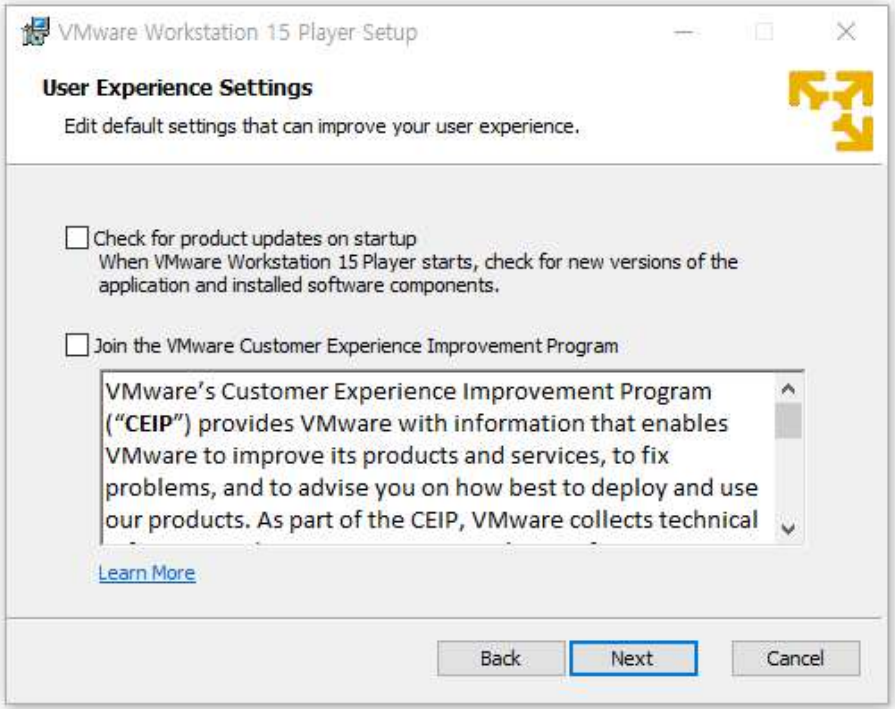




Install VMware

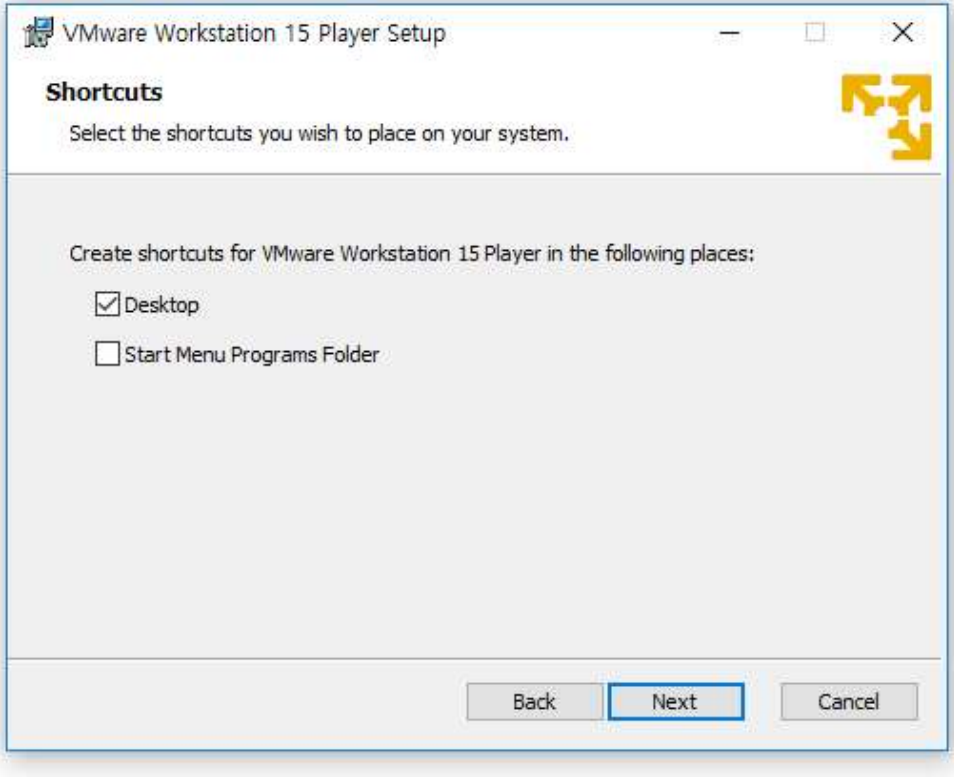
- VMware
  - Enhanced keyboard? (Not necessary)

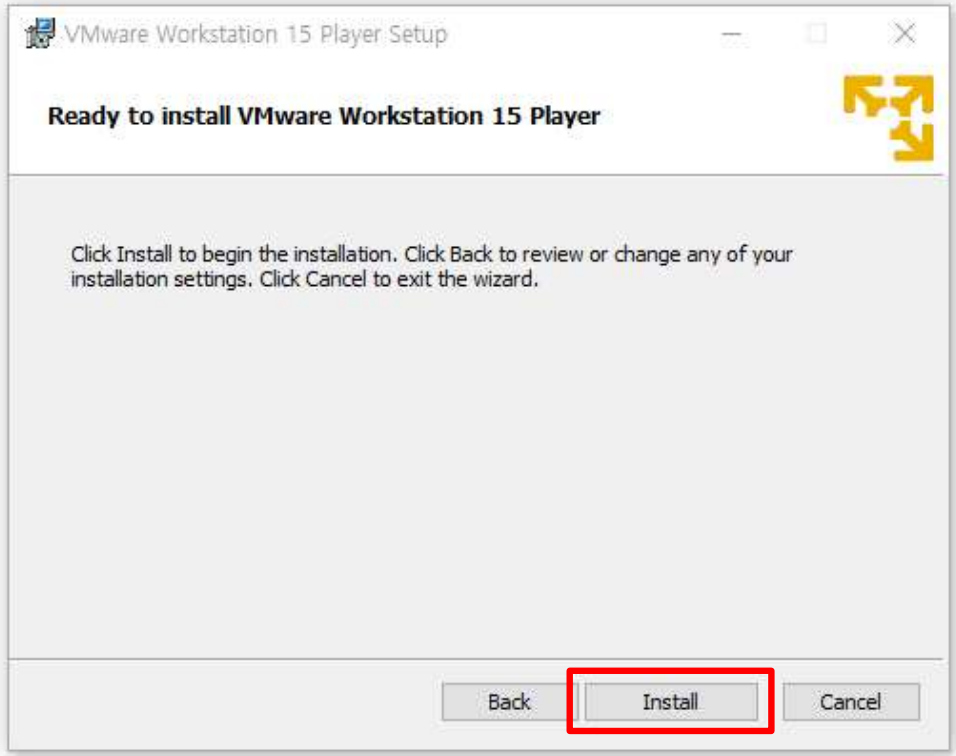




Install VMware

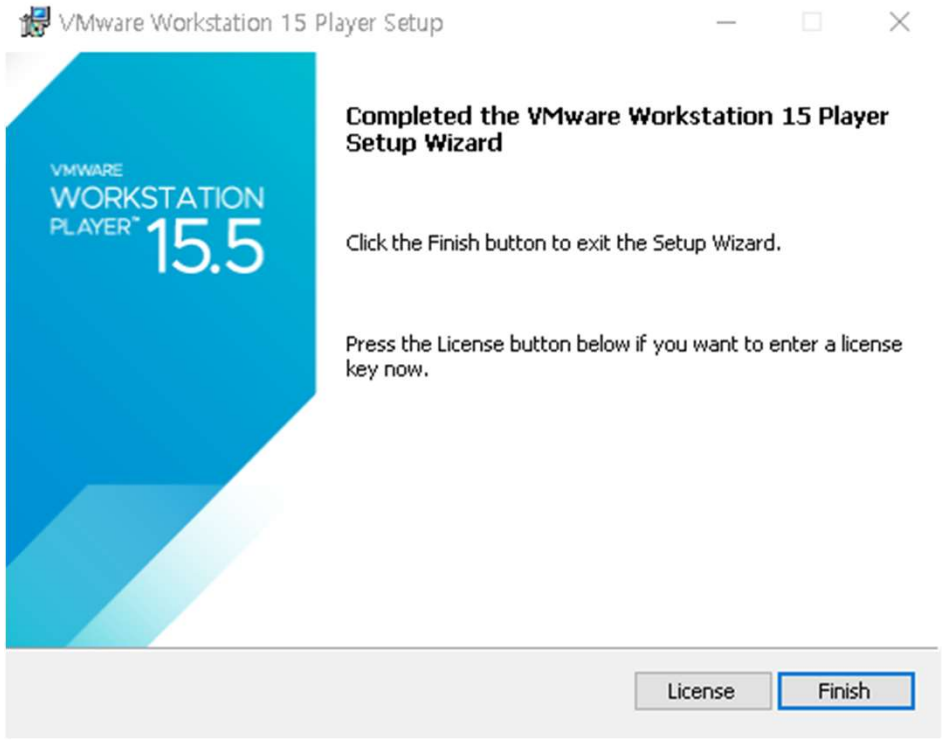
- VMware
  - Install





Install VMware

- VMware



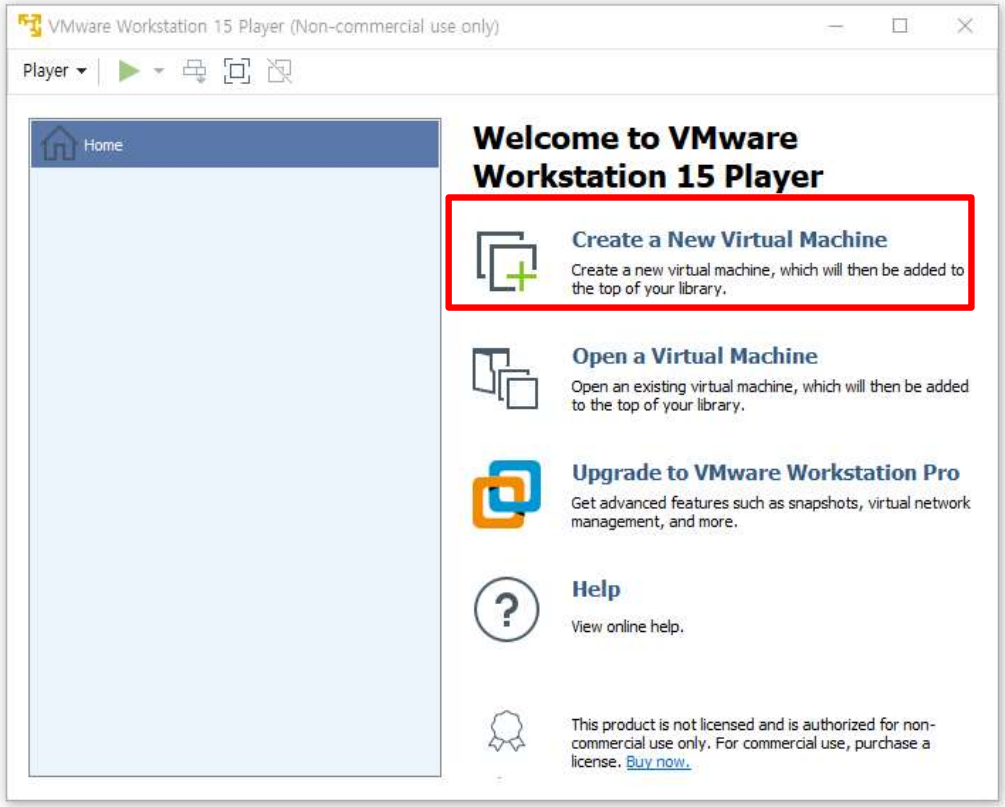
Prepare Linux image

- Ubuntu 18.04.4
  - https://old-releases.ubuntu.com/releases/18.04.4/

SHA256SUMS.gpg	2021-09-16 21:58	833
source/	2021-08-27 18:38	-
ubuntu-18.04-desktop-amd64.iso	2018-04-26 18:44	1.8G
ubuntu-18.04-desktop-amd64.iso.torrent	2018-04-26 20:58	72K
ubuntu-18.04-desktop-amd64.iso.zsync	2018-04-26 20:58	3.6M
ubuntu-18.04-desktop-amd64.list	2018-04-26 18:44	7.9K
ubuntu-18.04-desktop-amd64.manifest	2018-04-26 18:40	53K
ubuntu-18.04-desktop-amd64.metalink	2018-04-26 21:00	45K
ubuntu-18.04-live-server-amd64.iso	2018-04-26 19:48	806M
ubuntu-18.04-live-server-amd64.iso.torrent	2018-04-26 20:59	32K
ubuntu-18.04-live-server-amd64.iso.zsync	2018-04-26 20:59	1.6M

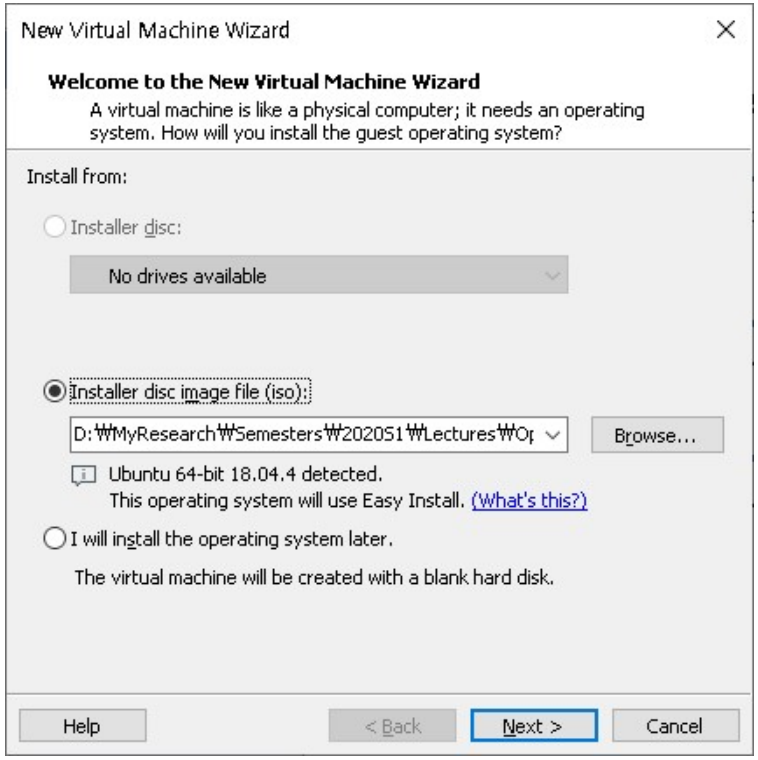
Install Linux on VMware

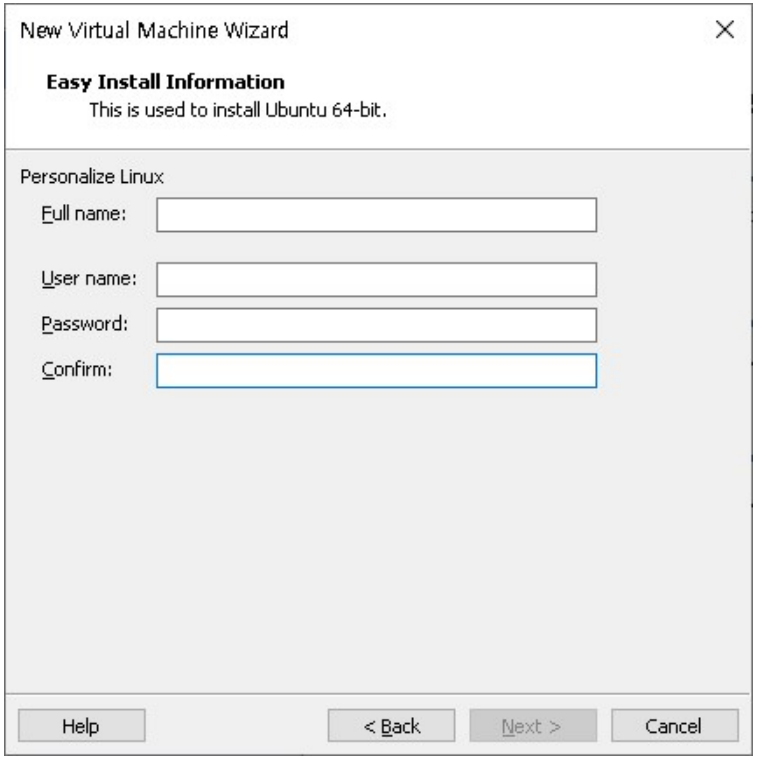
- VMware
  - Run WMware → Create New virtual machine



Install Linux on VMware

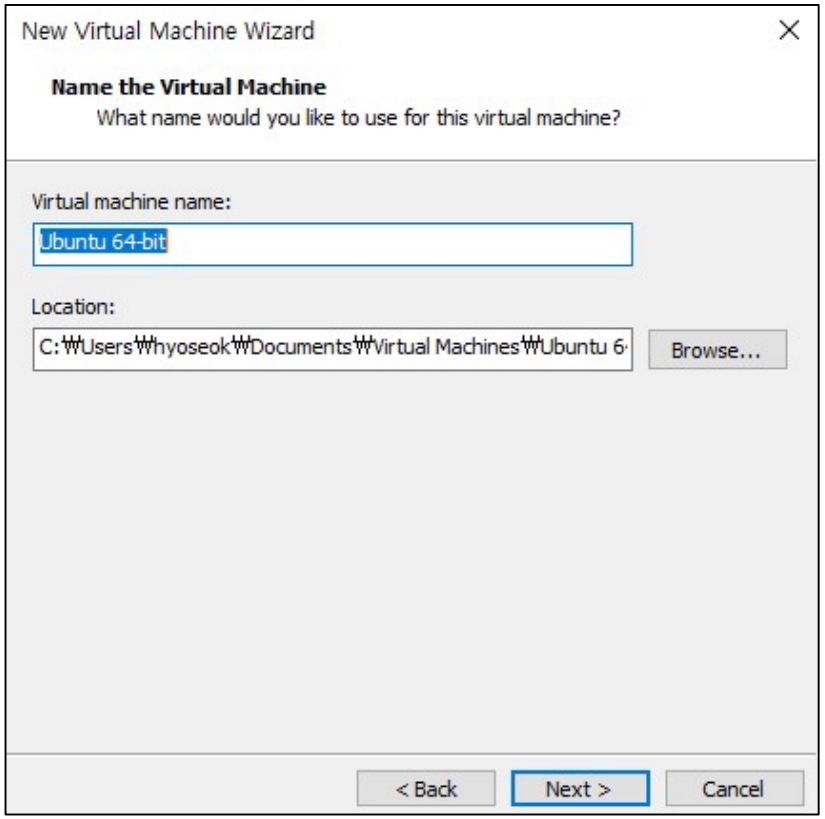
- Installer disc image → Download file
- Naming: it's free but your name is recommended (for check)

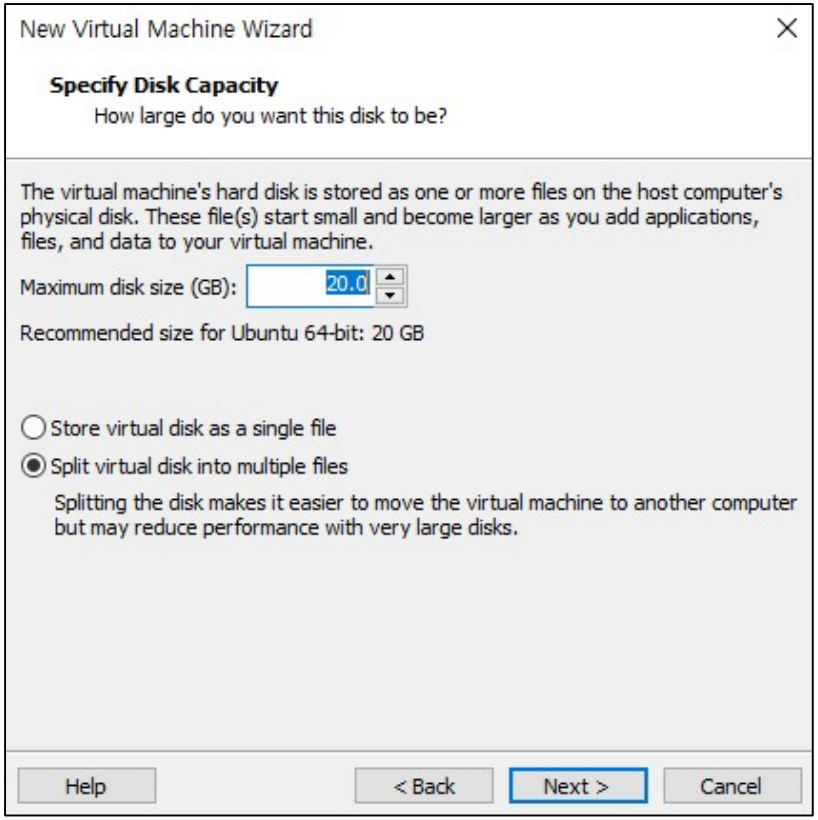




Install Linux on VMware

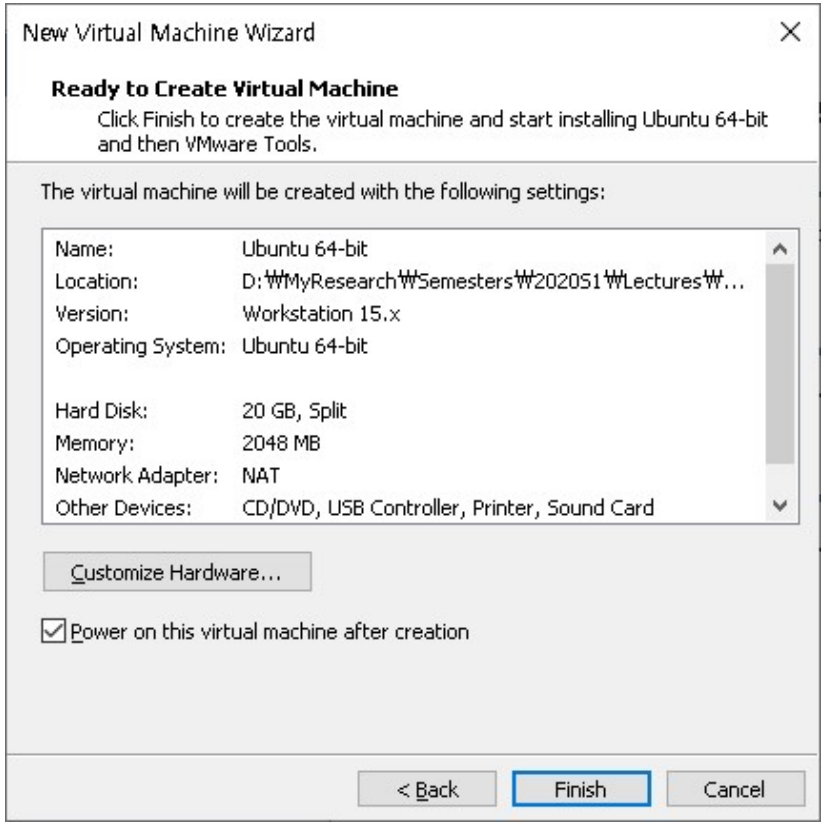
- Machine name is not important
- Disk size of 20GB is enough





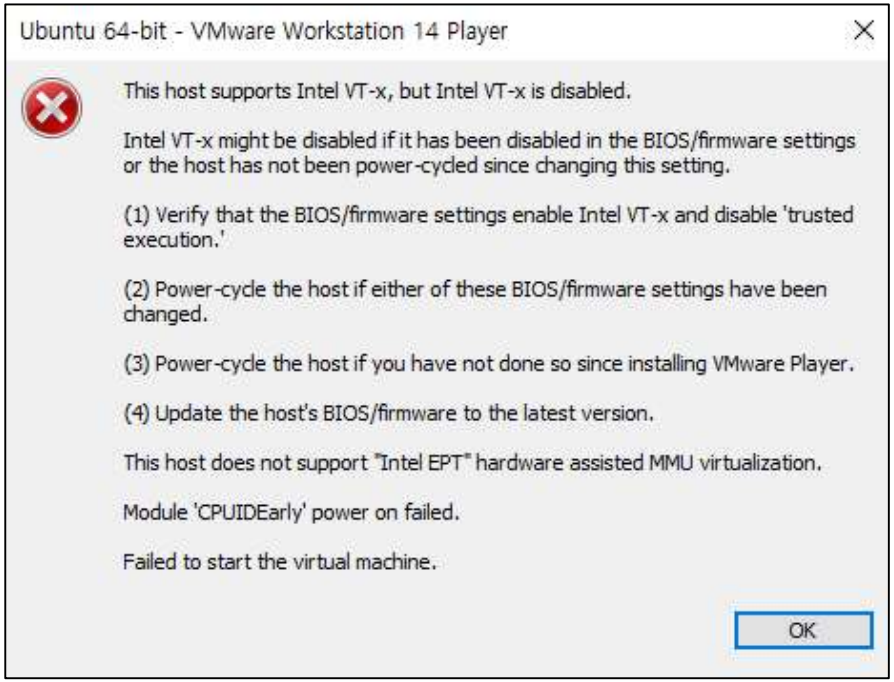
Install Linux on VMware

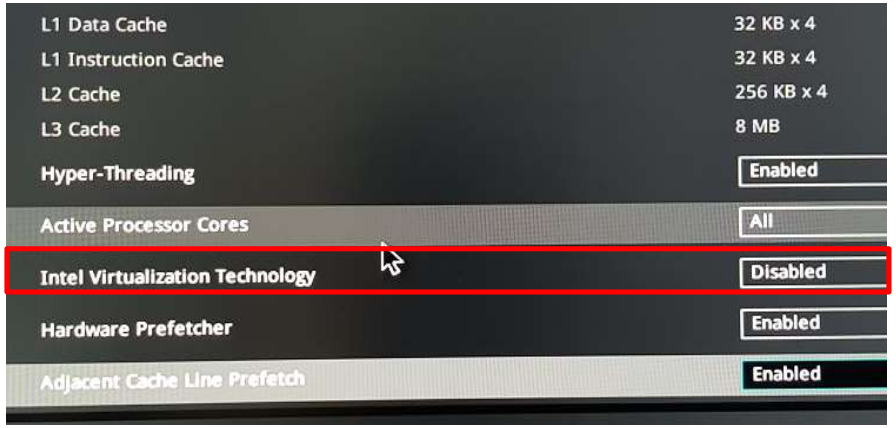
- Well done



Trouble shooting

- If the following warning appears, check your BIOS setting.





Enabled

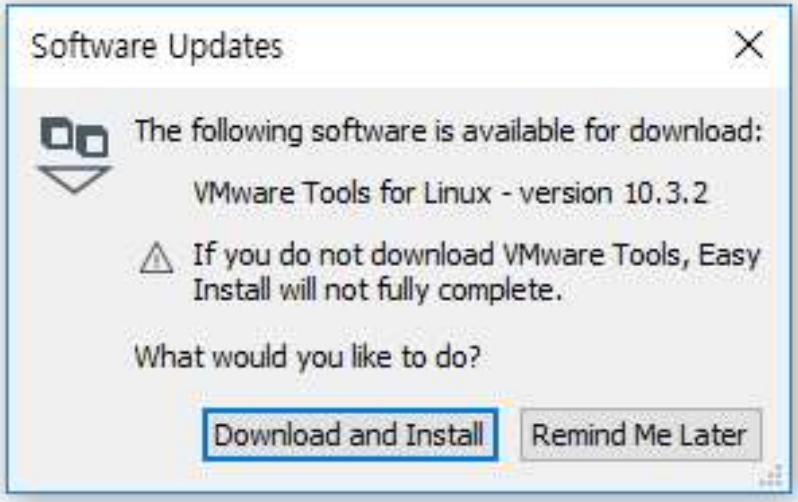
https://www.qtithow.com/2020/12/fix-error-this-host-supports-Intel-VT-x.html

https://youtu.be/hO9QidPwMEs

https://youtu.be/l4kcgYuxuU0?t=50

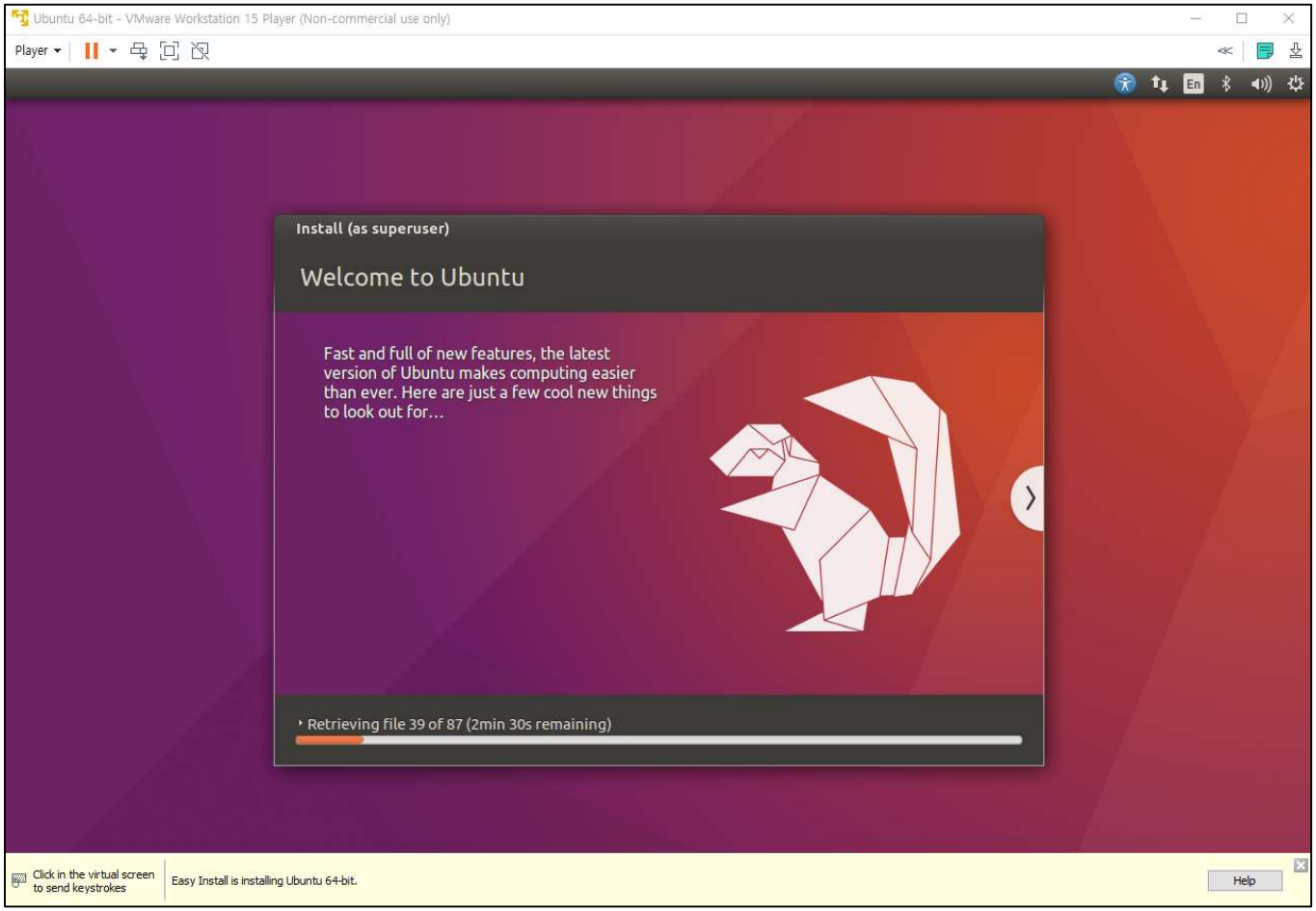
Install Linux on VMware

- Install on VMware



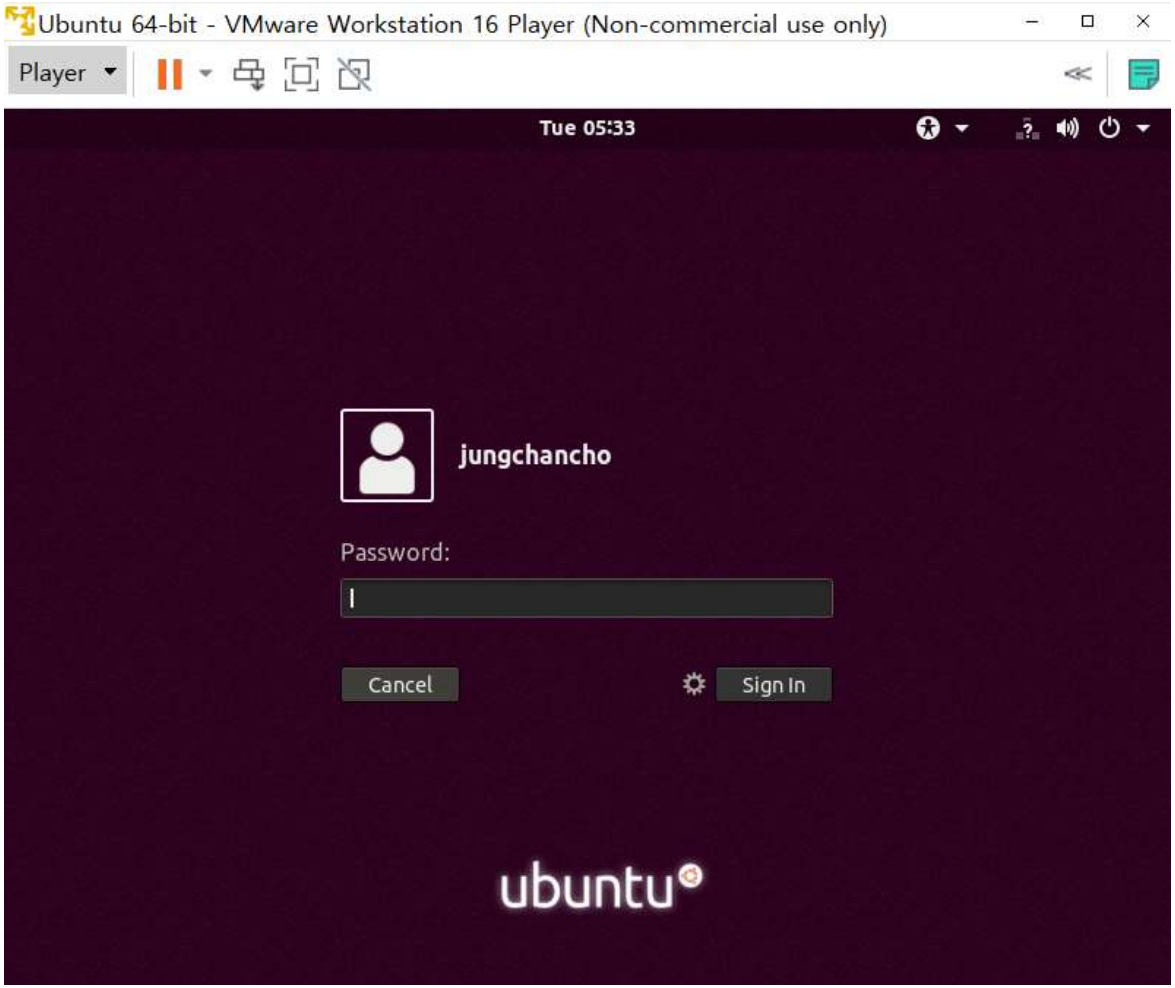
Install Linux on VMware

- Install on VMware



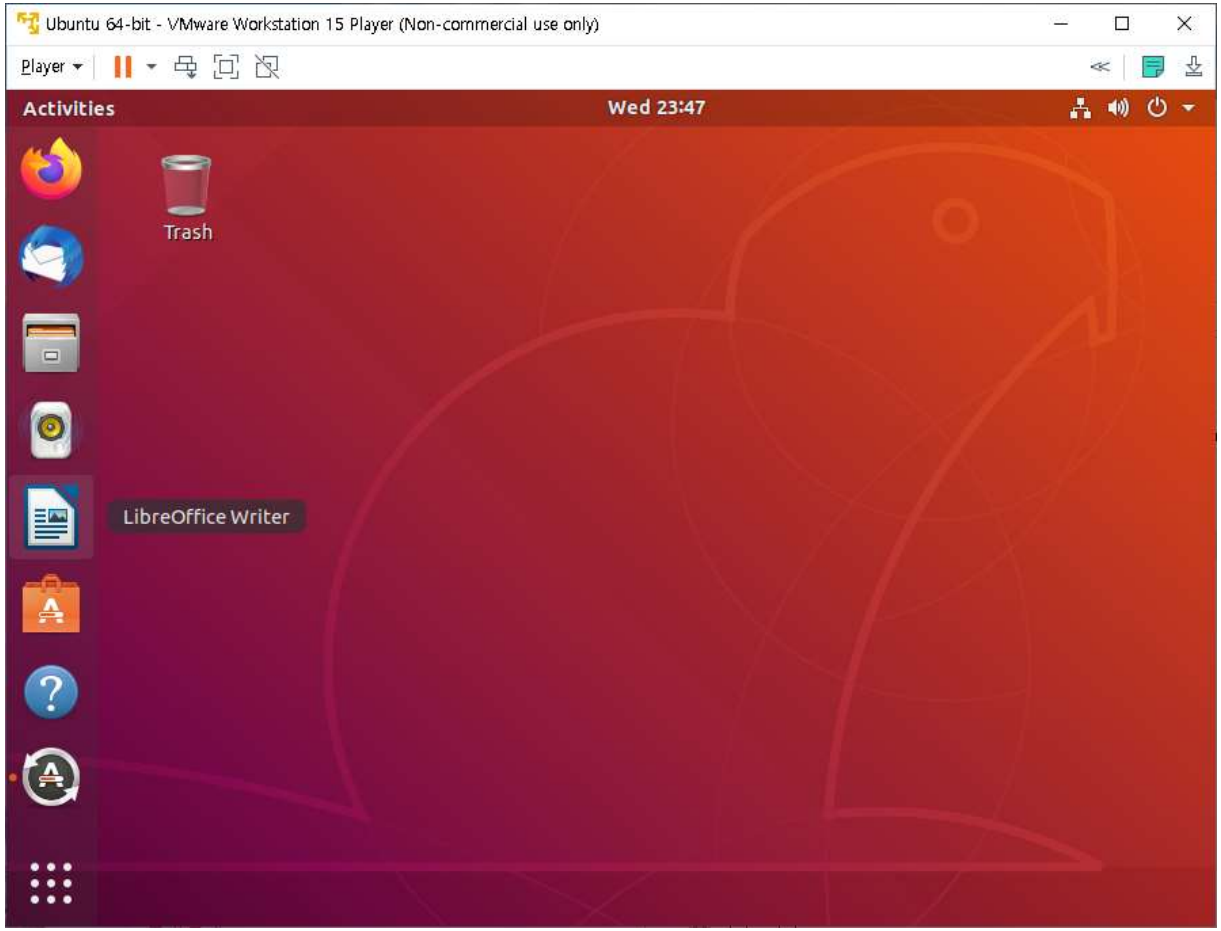
Linux Install

- Installation is done



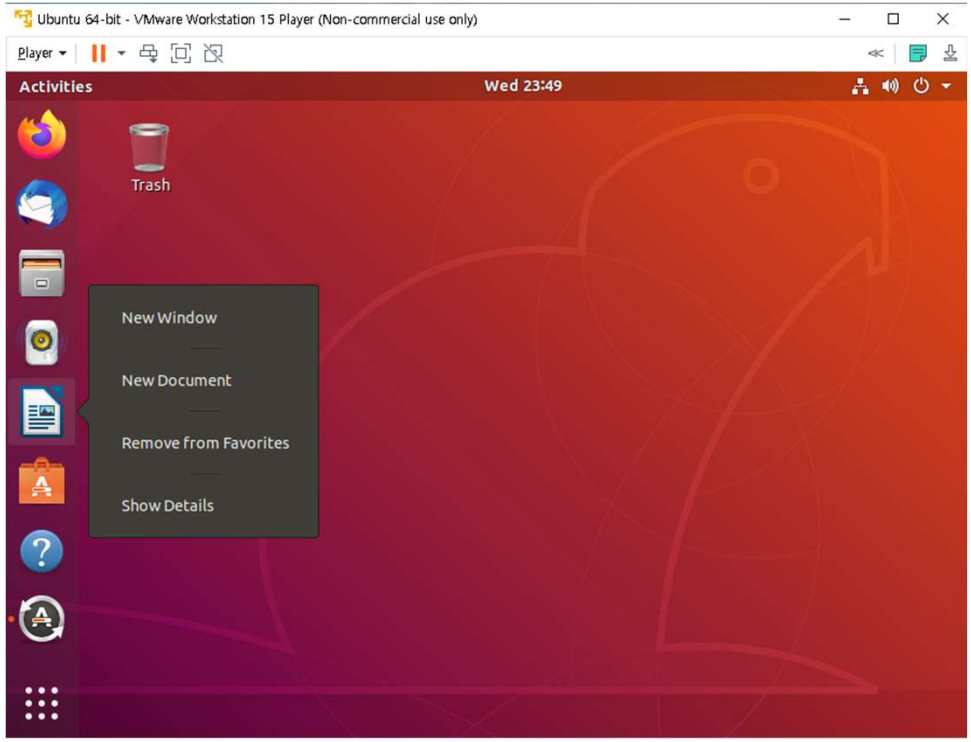
Linux Install

- Installation is done



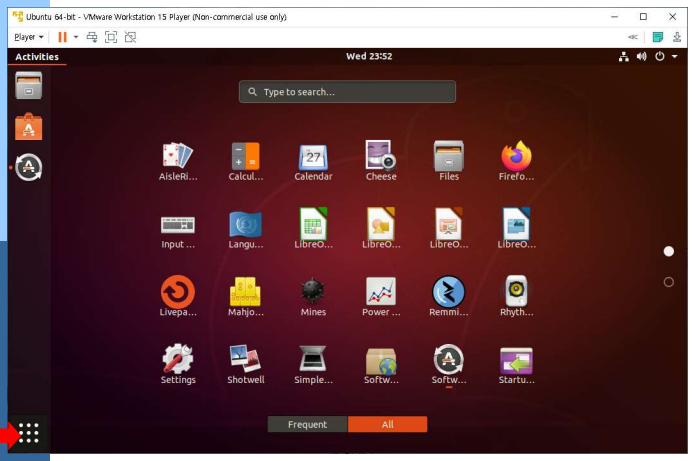
Linux Install

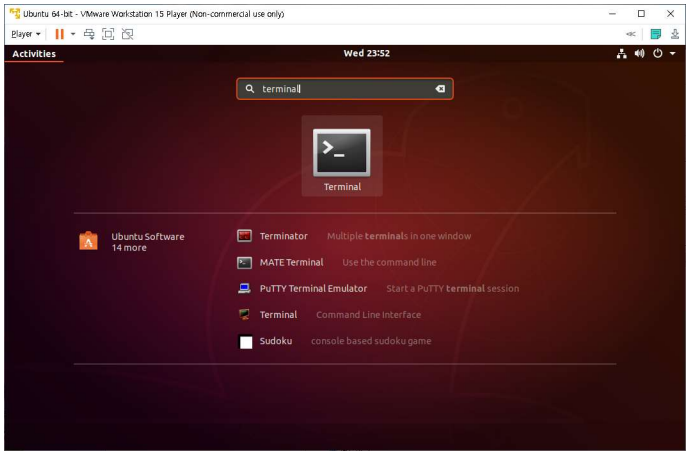
- Other icons can be removed
  - Right Click → Remove from launcher

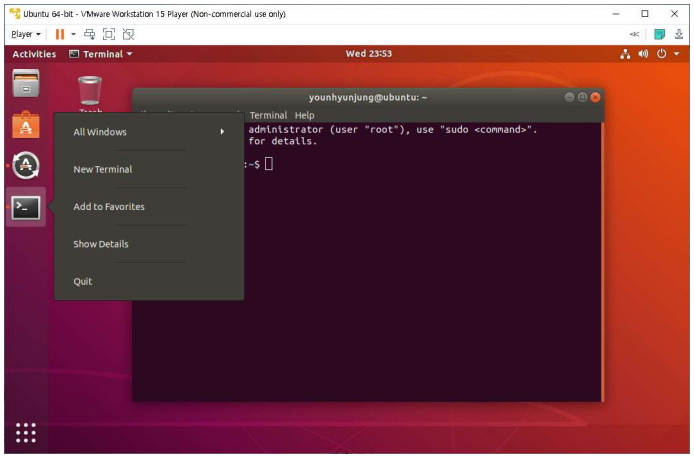


Linux Install

- Gnome-terminal
  - New tab: Ctrl + shift + t
  - Move between tabs: Ctrl + page up / ctrl + page down







Linux Install

- Current location
  - pwd
- Make your own directory
  - Go into a directory: cd [dir_name]
  - Back to higher level: cd ..

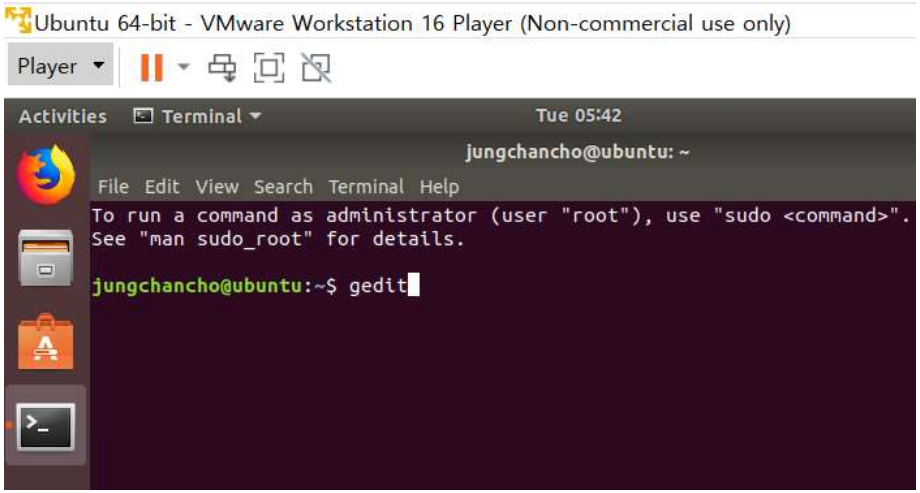
```
jungchancho@ubuntu:~$ pwd
/home/jungchancho
jungchancho@ubuntu:~$ mkdir homework
jungchancho@ubuntu:~$ cd homework
jungchancho@ubuntu:~/homework$ mkdir hw1
jungchancho@ubuntu:~/homework$ cd hw1
jungchancho@ubuntu:~/homework/hw1$
```

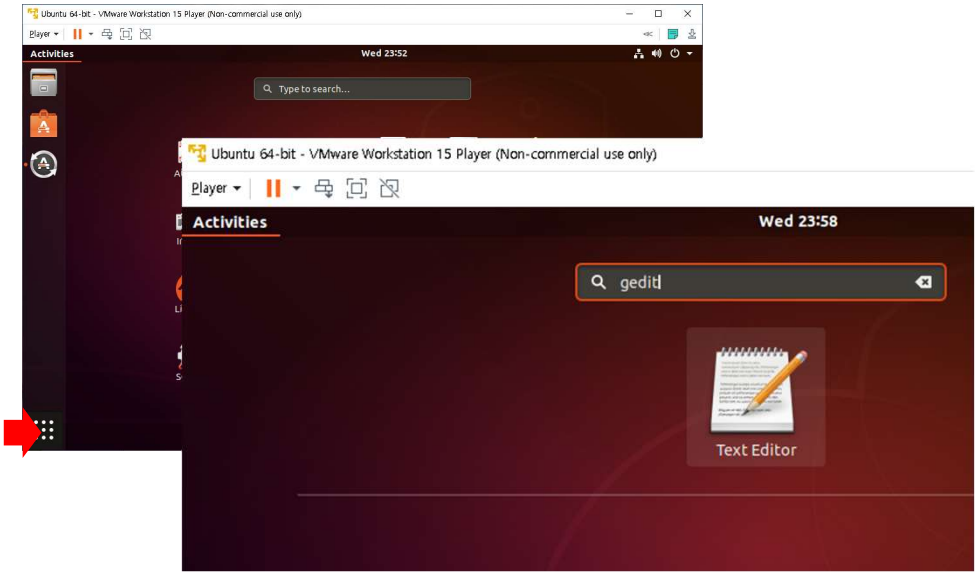
Linux Install

- Basic command
  - pwd: show current path
  - cd: change directory
    - . : current directory
    - .. : upper directory
    - If you enter just “cd + (enter)”, you would move to your home directory
  - mkdir: make directory Ex. mkdir hw1
  - rmdir: remove dir (directory should be empty)

Linux Install

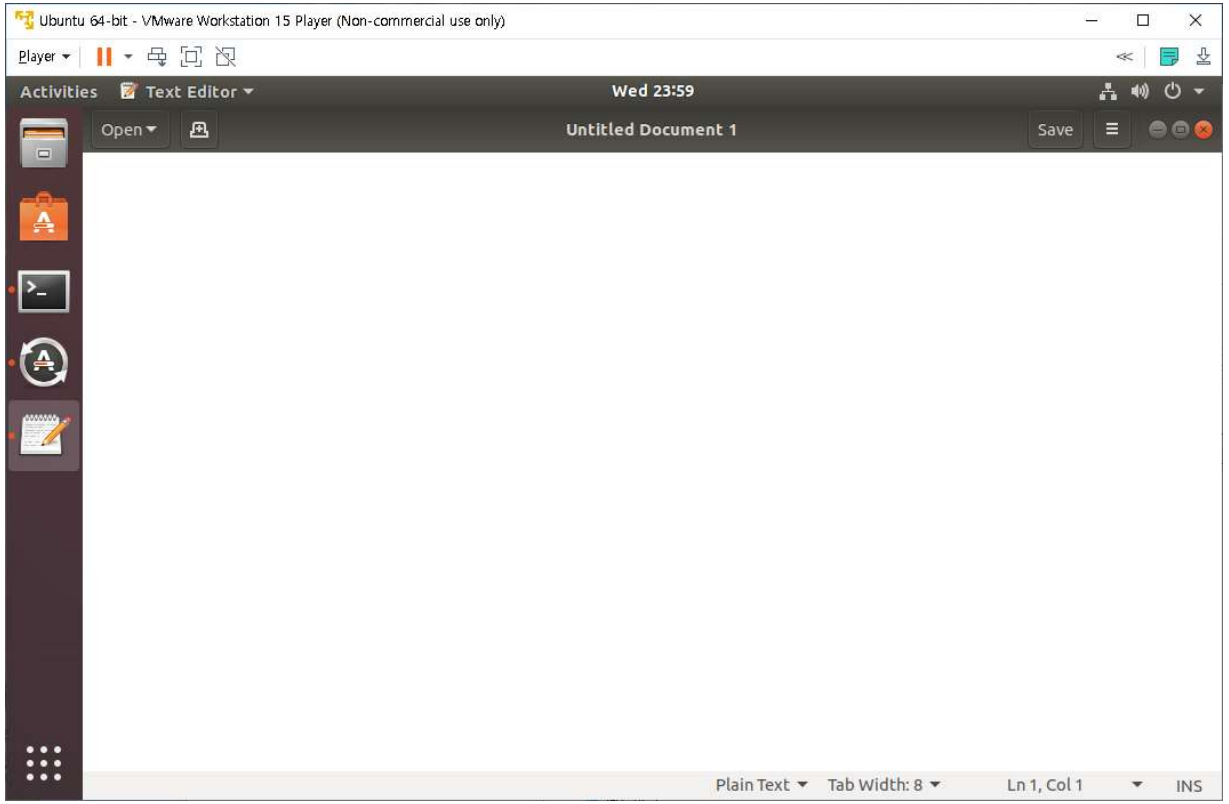
- Gedit
  - Application such as Notepad
  - 1. type gedit on the terminal
  - 2. type gedit on the search box → lock gedit to the launcher (recommended)





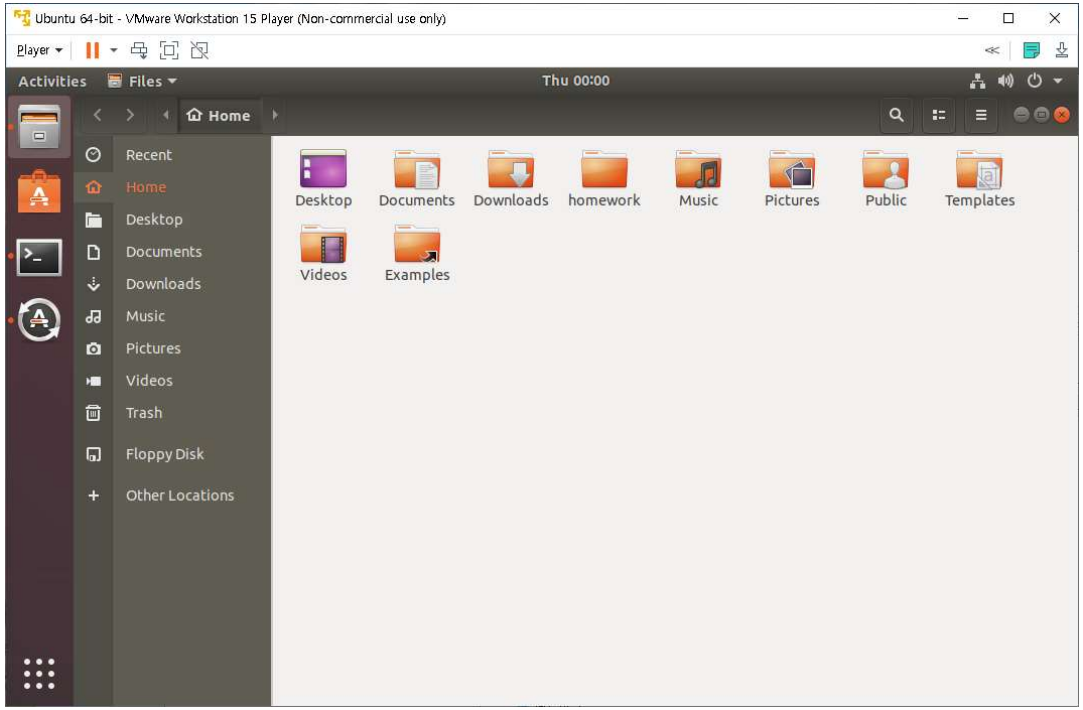
Linux Install

- Gedit
  - Gedit is very simple text editor



Linux Install

- Nautilus
  - Nautilus is a file browser
  - Initially locked into the launcher as “Files”



Linux Install

- Gcc install
  - sudo apt-get install gcc

```
jungchancho@ubuntu:~/homework/hw1$ sudo apt-get install gcc
[sudo] password for jungchancho:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  cpp cpp-7 gcc-7 gcc-7-base gcc-8-base libasan4 libatomic1 libc-dev-bin libc6
  libc6-dbg libc6-dev libcc1-0 libcilkrts5 libgcc-7-dev libgcc1 libgomp1
  libitm1 liblsan0 libmpx2 libquadmath0 libstdc++6 libtsan0 libubsan0
  linux-libc-dev manpages-dev
Suggested packages:
  cpp-doc gcc-7-locales gcc-multilib make autoconf automake libtool flex bison
  gcc-doc gcc-7-multilib gcc-7-doc libgcc1-dbg libgomp1-dbg libitm1-dbg
  libatomic1-dbg libasan4-dbg liblsan0-dbg libtsan0-dbg libubsan0-dbg
  libcilkrts5-dbg libmpx2-dbg libquadmath0-dbg glibc-doc
The following NEW packages will be installed:
  gcc gcc-7 libasan4 libatomic1 libc-dev-bin libc6-dev libcilkrts5 libgcc-7-dev
  libitm1 liblsan0 libmpx2 libquadmath0 libtsan0 libubsan0 linux-libc-dev
  manpages-dev
The following packages will be upgraded:
  cpp cpp-7 gcc-7-base gcc-8-base libc6 libc6-dbg libcc1-0 libgcc1 libgomp1
  libstdc++6
10 upgraded, 16 newly installed, 0 to remove and 676 not upgraded.
Need to get 36.0 MB of archives.
After this operation, 76.5 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Linux Install

- Vim install (Optional)
  - sudo apt-get install vim
- How to use: http://gyuha.tistory.com/157

```
jungchancho@ubuntu:~$ sudo apt-get install vim
[sudo] password for jungchancho:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  vim-common vim-runtime vim-tiny
Suggested packages:
  ctags vim-doc vim-scripts indent
The following NEW packages will be installed:
  vim vim-runtime
The following packages will be upgraded:
  vim-common vim-tiny
2 upgraded, 2 newly installed, 0 to remove and 674 not upgraded.
Need to get 7,136 kB of archives.
After this operation, 32.0 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Linux install (VI)

```
jungchancho@ubuntu:~/homework/hw1$ vi hw1.c
```

- Make your own code
  - Text mode: i / edit mode: esc
  - Save → :w
  - Quit → :q

```
#include <stdio.h>

int main()
{
        char name[20];
        printf("What is your name?");
        scanf("%s", name);
        printf("Hello, %s!\n", name);

        return 0;
}
~
~
~
~
~
~
~
~
~
~
~
~
~
"hw1.c" [New] 11L, 146C written                    8,30-37       All
```

Practice 1

- Build simple code on Linux for the first time
  - Ask what your name
  - Answer
  - Print “his/her” name

```
jungchancho@ubuntu:~/homework/hw1$ ./a.out
What is your name?jungchan
Hello, jungchan
```

- Edit code
  - Make a new directory (ex. Mkdir hw1)
  - Change directory (ex. Cd hw1)
  - Make new text file / edit / save as hw1.c

- Build source code
  - You can edit your source code using either Vim or Gedit.
  - Compile (Assembler) your code using gcc

Practice 1

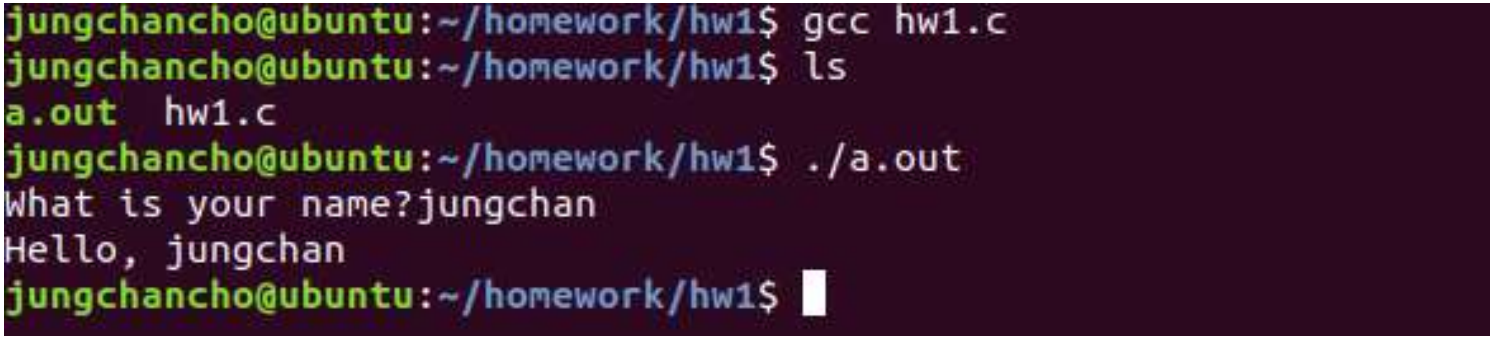
- How to build?
  - gcc [filename.c] will generate a.out (compile, assembly)
    - Ex. gcc hw1.c
  - a.out is a binary file
  - Run file by typing that name
    - Caution: executable file needs correct path (if not, system will search the path)
    - Current path can be represented as “./”

```
jungchancho@ubuntu:~/homework/hw1$ gcc hw1.c
jungchancho@ubuntu:~/homework/hw1$ ls
a.out  hw1.c
jungchancho@ubuntu:~/homework/hw1$ ./a.out
What is your name?jungchan
Hello, jungchan
jungchancho@ubuntu:~/homework/hw1$
```

Practice mission

- Submit your screenshot image file named “hw1_ID_NAME.jpg” to cyber campus

  - An example of the screenshot image file



  - Due: 2022/03/23 (23:59)

Practice 2

- Exercise file operation
  - Make your own directory
    - mkdir hw2 → cd hw2 → mkdir test → cd test
  - touch create file
    - Ex. touch aaa.txt
  - ls: list files in a directory
    - Ex. ls
  - cp: copy file
    - Ex. cp aaa.txt bbb.txt
  - rm: remove file (can be applicable to a directory)
    - Ex. rm aaa.txt
  - mv: move file (or change name)
    - Ex. mv bbb.txt ccc.txt
  - remove directory
    - cd ..
    - rm –r test
  - TIP: man (manual) will show you more detail
    - Ex. man cp