T01. Connecting to the Server and Introduction to Linux

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Using Terminal

Terminal lets a person directly communicate with the computer with command line interface (↔ graphical user interface)

For Windows: search Windows Terminal from the task bar at the bottom of the screen. If it is not installed, you need to install it from the Microsoft app store

For MacOS: terminal would have been installed by default
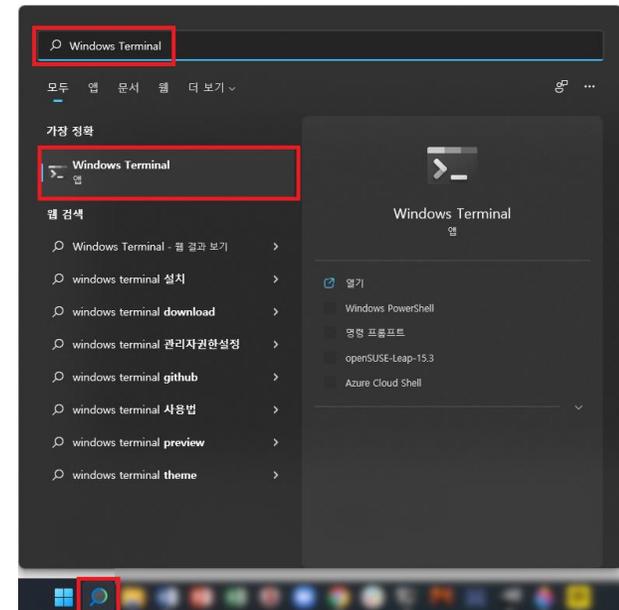
Using Terminal

Windows terminal should look like this
Note that it is different from the normal command prompt (cmd.exe)
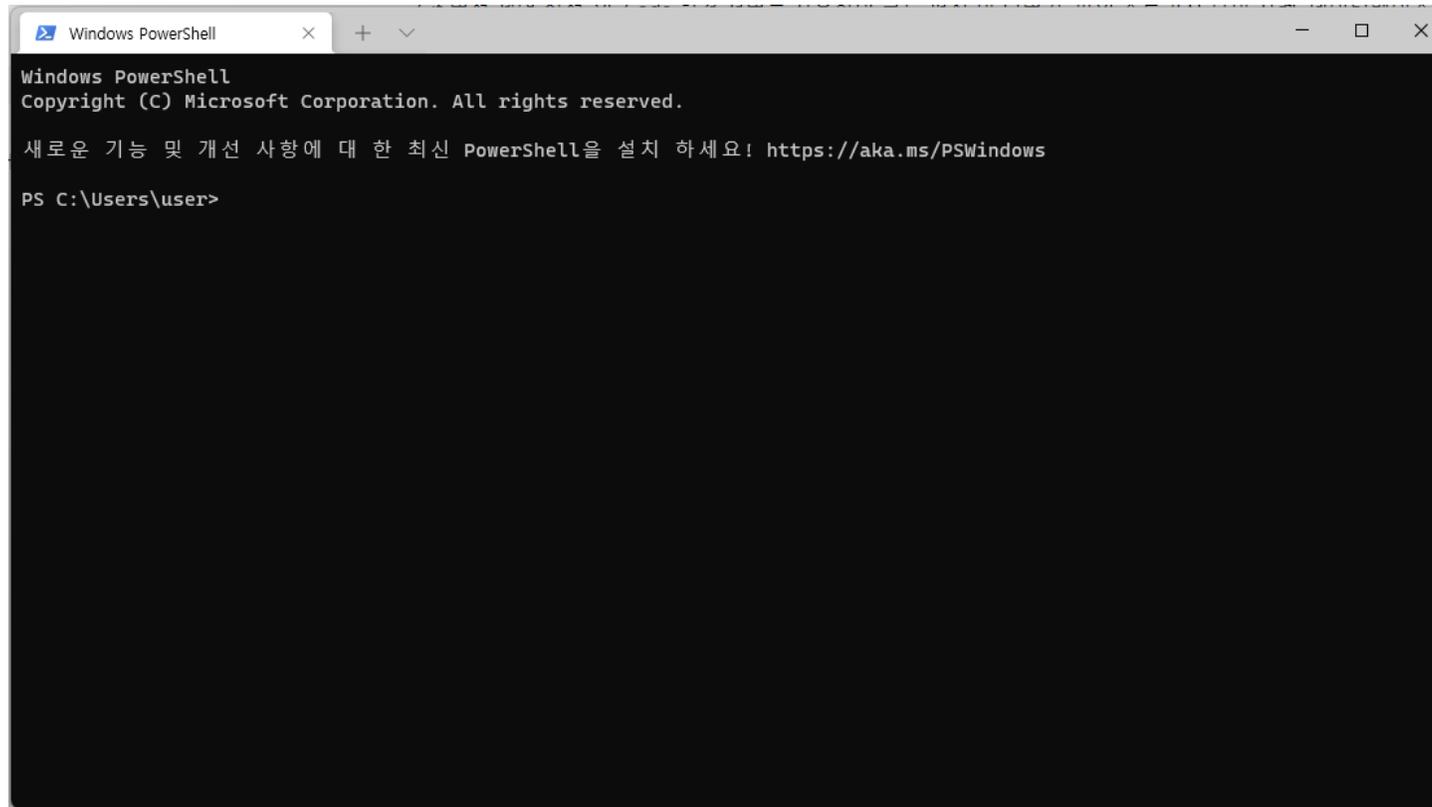
Using Terminal

Press the "v" shaped button on the top and select Option (설정) from the menu
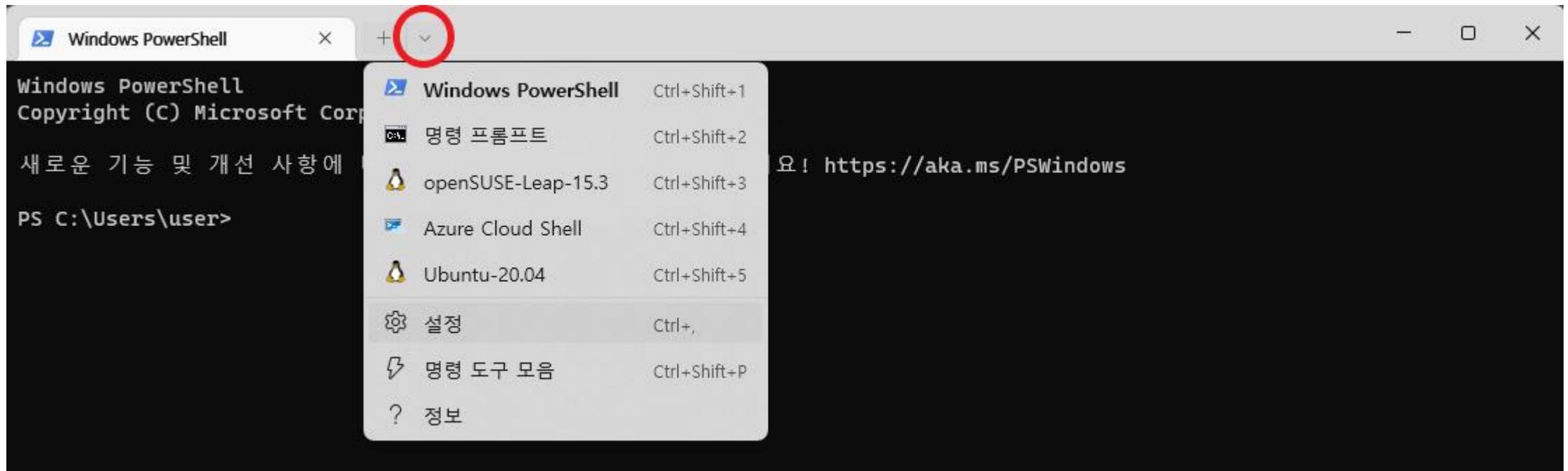
Using Terminal

Add the new hotkeys to the copy (ctrl+shift+c) and paste (ctrl+shift+v) tasks, and delete the old ones (ctrl+c and ctrl+v)
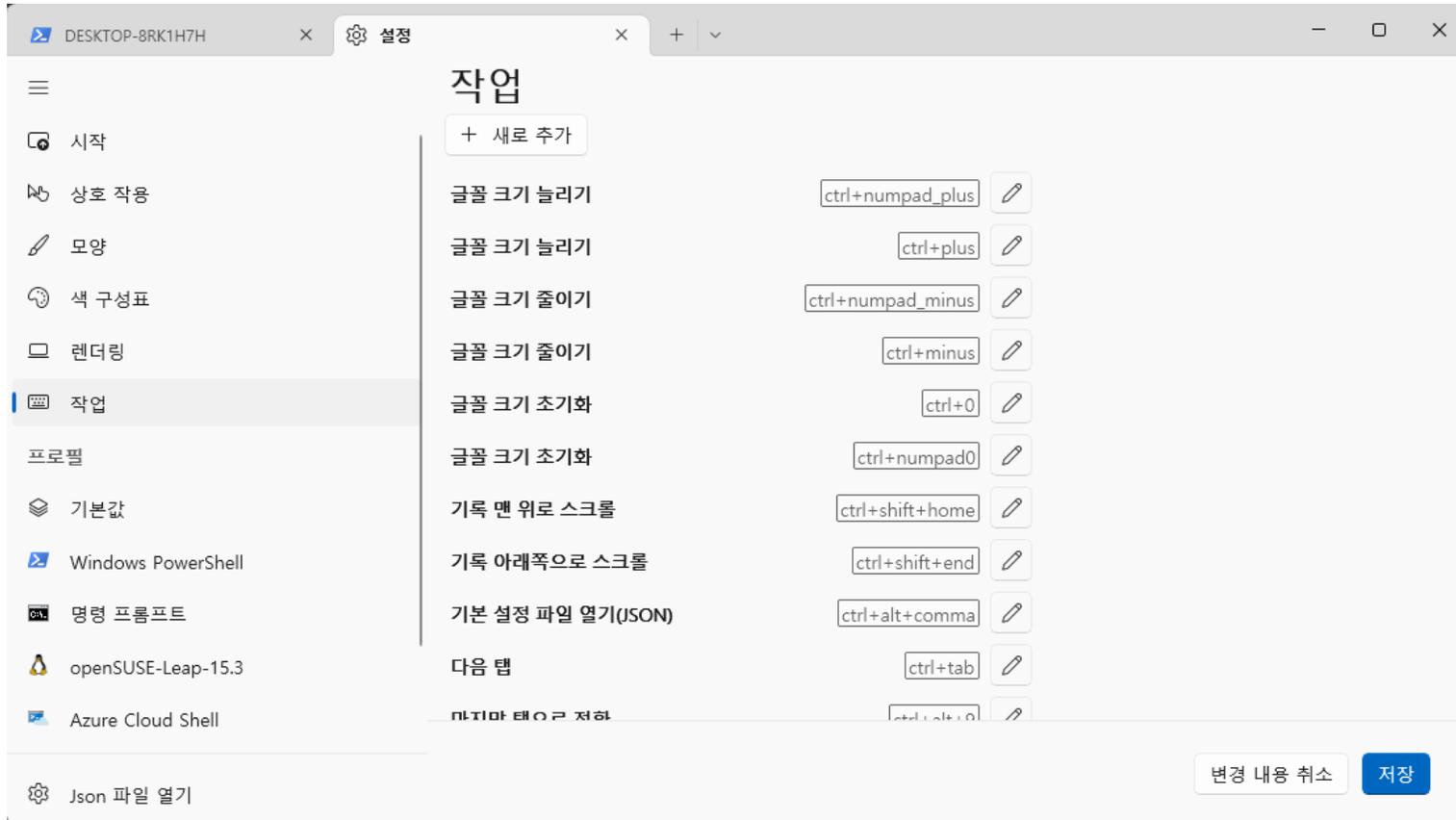
This is because ctrl+c is reserved for forced stop in Linux

So we want to prevent any potential conflict

Connecting to the Server

In this lecture, the students will use the supercomputer cluster in Room #902 of the Basic Science Bldg. A (기초과학특성화과학관 A동)

Type the following command to connect to the server:

ssh -p XXXX <ID>@168.131.XXX.XXX

Whenever there is a word in the angular brackets <>, it must not be interpreted literally and needs to be replaced by an appropriate word, number, path, etc.

This is a very common confusion for people who is not used to the language of command line interface.

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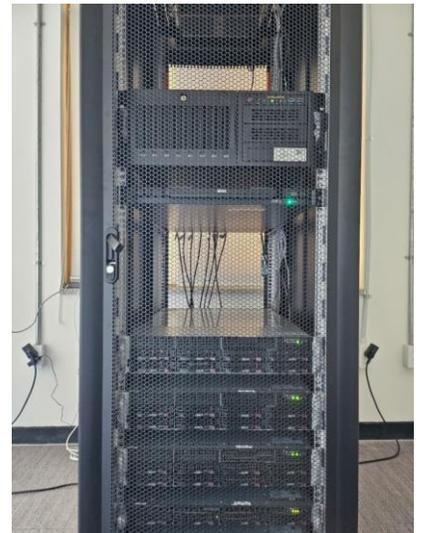
Connecting to the Server

Each person is assigned to a unique ID made by c<student number>.

For example, if your student number is 080455, the ID is c080455.

When you type the command, you will be asked a question to make sure that you want to connect to a foreign computer. Type yes

The default password is 1, which can be changed by typing passwd

You are now connected to the server via the terminal

In the next few slides, we will learn some basic commands for control

Basic Linux Concepts and Commands

For creating and removing files and folders

touch: creates an empty file (error when no argument is specified)
touch a.txt: creates an empty file named a.txt

mkdir: creates an empty folder (error when no argument is specified)
mkdir test: creates an empty folder named test

rm: removes files or folders (error when no argument is specified)

rm a.txt: removes the file named a.txt

rm -r test: removes the folder named test (-r: recursive)

rm -r *: removes all files and folders in the current location

Basic Linux Concepts and Commands

For browsing

ls: lists the files and folders in the current folder

You can give options to ls to show additional information

ls -l: show size and permission

ls -a: show hidden files (which start with .)

ls -t: sort the files by the time it was last modified

You can use these options in combination, such as ls -alt

ls -h: make the size human-readable (meaningful only when used with -l)

ls --help: list all available options for ls

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Basic Linux Concepts and Commands

For moving to different locations

In Linux, there are two ways to specify a path: absolute and relative path

An absolute path starts from /, while a relative path does not

/ is also used to split the names of the parent and subordinate folders

pwd: shows the absolute path for your current location

/: the root directory

.: the current directory

..: the parent directory

~: the default directory of an account (/home/<ID>)

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Basic Linux Concepts and Commands

For moving to different locations

cd <location>: moves you to <location>, which can be either absolute or relative path

cd test: moves into the folder named test in the current directory (shows you an error message when it does not exist)

cd .: does nothing

cd ..: moves to the parent directory

cd : moves to default directory

cd ~: moves to default directory

Basic Linux Concepts and Commands

For moving and copying files and folders

The descriptions below are valid when there is a folder named test

mv -i a.txt b.txt: rename a.txt to b.txt

　　　　　　　　　　-i ask for confirmation when overwriting an existing file

mv a.txt test: move a.txt inside test (when there is a directory named test)

cp a.txt b.txt: copy a.txt to b.txt

cp a.txt test/b.txt: copy a.txt inside test and set the name as b.txt

cp -r test test2: copy test to test2 with all the files inside it

　　　　　　　　　　-r (recursive) is required when requesting to copy a folder

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Reading and Editing the File by Using vi

An editor lets one to read and edit the content of files

There are several editors, but vi is usually the most recommended for people who first learn how to use Linux

vi: open a new document without specifying the file name

vi a.txt: open a new document whose name is a.txt

There are two different modes in vi editor:
- Command mode
- Write mode

You can edit the content of your files by typing only when you are in the write mode

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Reading and Editing the File by Using vi

vi is always launched in command mode, and the write mode is activated by pressing i

You can know that you are in the write mode by recognizing ---INSERT--- or ---REPLACE--- at the bottom left

The insert and replace are toggled by pressing insert

To go back to the command mode, press esc

In command mode, you can do various things such as
- Save/exit
- Browse
- Editing the text without direct typing

Reading and Editing the File by Using vi

Many commands start with : (colon)

For such commands, you can check what you have typed by looking at bottom left of the screen

:q : quit the editor (when no changes are made)

:wq : save the changes and quit the editor

:q! : discard the changes and quit the editor

:w a.txt : save the file as new and set the name as a.txt

:e b.txt : open b.txt without quitting the editor

:<number> : go to line number <number>

Reading and Editing the File by Using vi

There are also other commands which do not start with :

dd: delete one line where the cursor is

d<number>: delete <number> lines from the line where the cursor is

G: jump to the end of the file

u: undo the change

ctrl+r: redo the change

/<word>: forward search for <word>

?<word>: backward search for <word>

Miscellaneous

If you are too familiar with the windows hotkey and press ctrl+z when you are working with vi, it gives you this message:


```
guest@DESKTOP-8RK1H7H:~$ vi

[1]+  Stopped                 vi
guest@DESKTOP-8RK1H7H:~$
```

This means that vi moved to the background and stopped

We can get it back to the foreground by typing fg 1

top: launch the task manager

ctrl+c: stop the process

kill <job number>: force to stop the process

exit: terminate the session and log out to Windows

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Copying Files from the Server

We can use scp (ssh + cp) to copy the files between remote computers

Note that the password is required every time

scp -rp -P XXXX a.txt <ID>@168.131.XXX.XXX:~

Copy a.txt in the current folder of the personal laptop to the default directory of the server

scp -rp -P XXXX <ID>@168.131.XXX.XXX:~/b.txt .

Copy b.txt in the default directory on the server to the current folder in the personal laptop

If not specified, the files are stored in C:\Users\<Windows ID>