

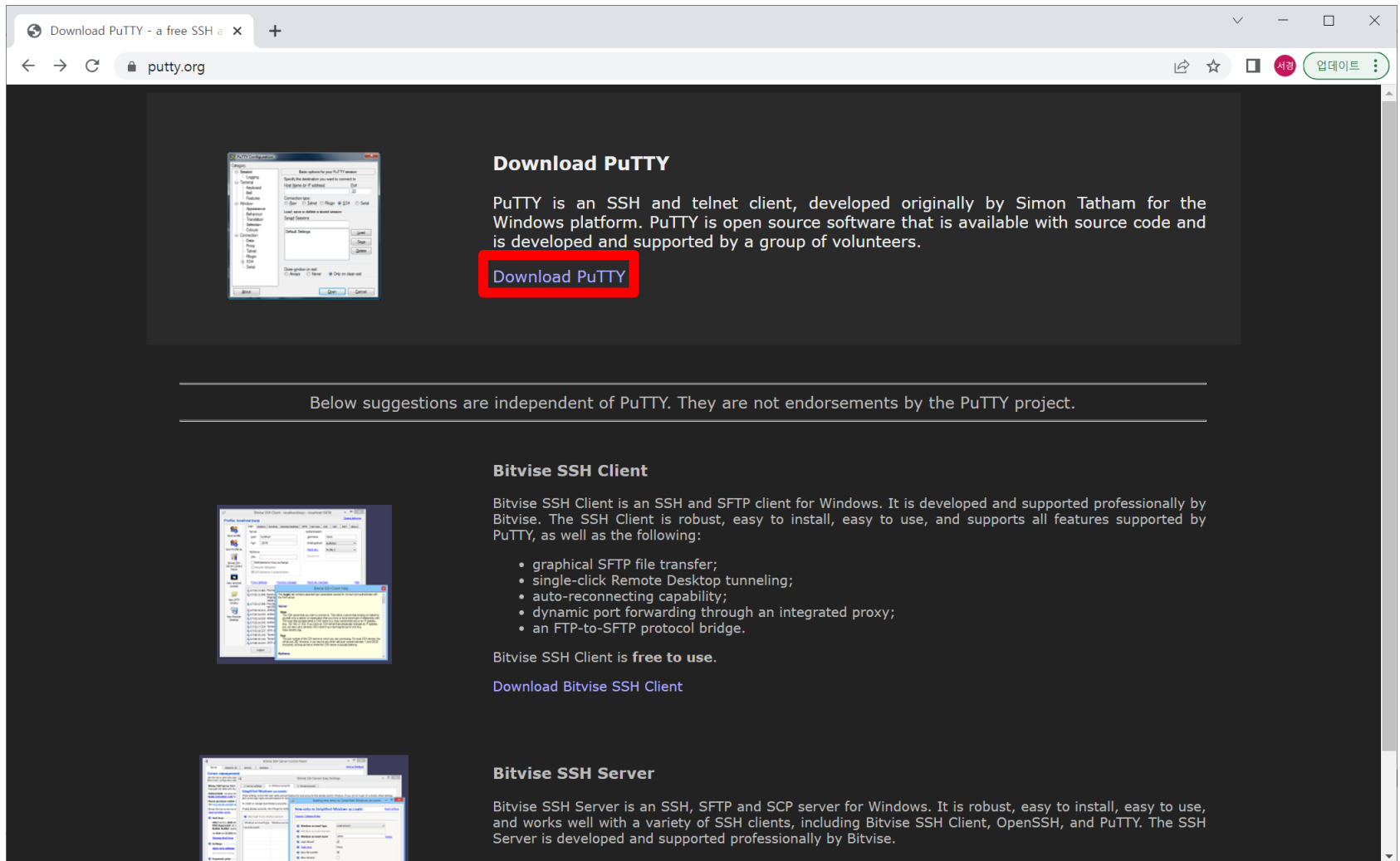
Linux Tutorial

For CSE courses in Sogang University

- Connecting to CSPRO (in Windows): 3 page~
 - Putty
 - Filezilla
- Connecting to CSPRO (in Mac): 19 page~
 - Terminal
 - Filezilla
- Basic Linux commands and usages: 25 page~

Connecting to CSPRO (in Windows)

- Go to 'https://www.putty.org/' and click 'Download PuTTY'



The screenshot shows the PuTTY.org website in a web browser. The browser's address bar displays 'putty.org'. The main content area features a dark background with a white box containing the text 'Download PuTTY' and a red button labeled 'Download PuTTY'. To the left of this box is a small image of the PuTTY installation window. Below this section, there is a horizontal line with the text 'Below suggestions are independent of PuTTY. They are not endorsements by the PuTTY project.' Below this line, there are two more sections: 'Bitvise SSH Client' and 'Bitvise SSH Server'. Each section includes a small image of the respective software's interface and a list of features or descriptions.

Download PuTTY

PuTTY is an SSH and telnet client, developed originally by Simon Tatham for the Windows platform. PuTTY is open source software that is available with source code and is developed and supported by a group of volunteers.

[Download PuTTY](#)

Below suggestions are independent of PuTTY. They are not endorsements by the PuTTY project.

Bitvise SSH Client

Bitvise SSH Client is an SSH and SFTP client for Windows. It is developed and supported professionally by Bitvise. The SSH Client is robust, easy to install, easy to use, and supports all features supported by PuTTY, as well as the following:

- graphical SFTP file transfer;
- single-click Remote Desktop tunneling;
- auto-reconnecting capability;
- dynamic port forwarding through an integrated proxy;
- an FTP-to-SFTP protocol bridge.

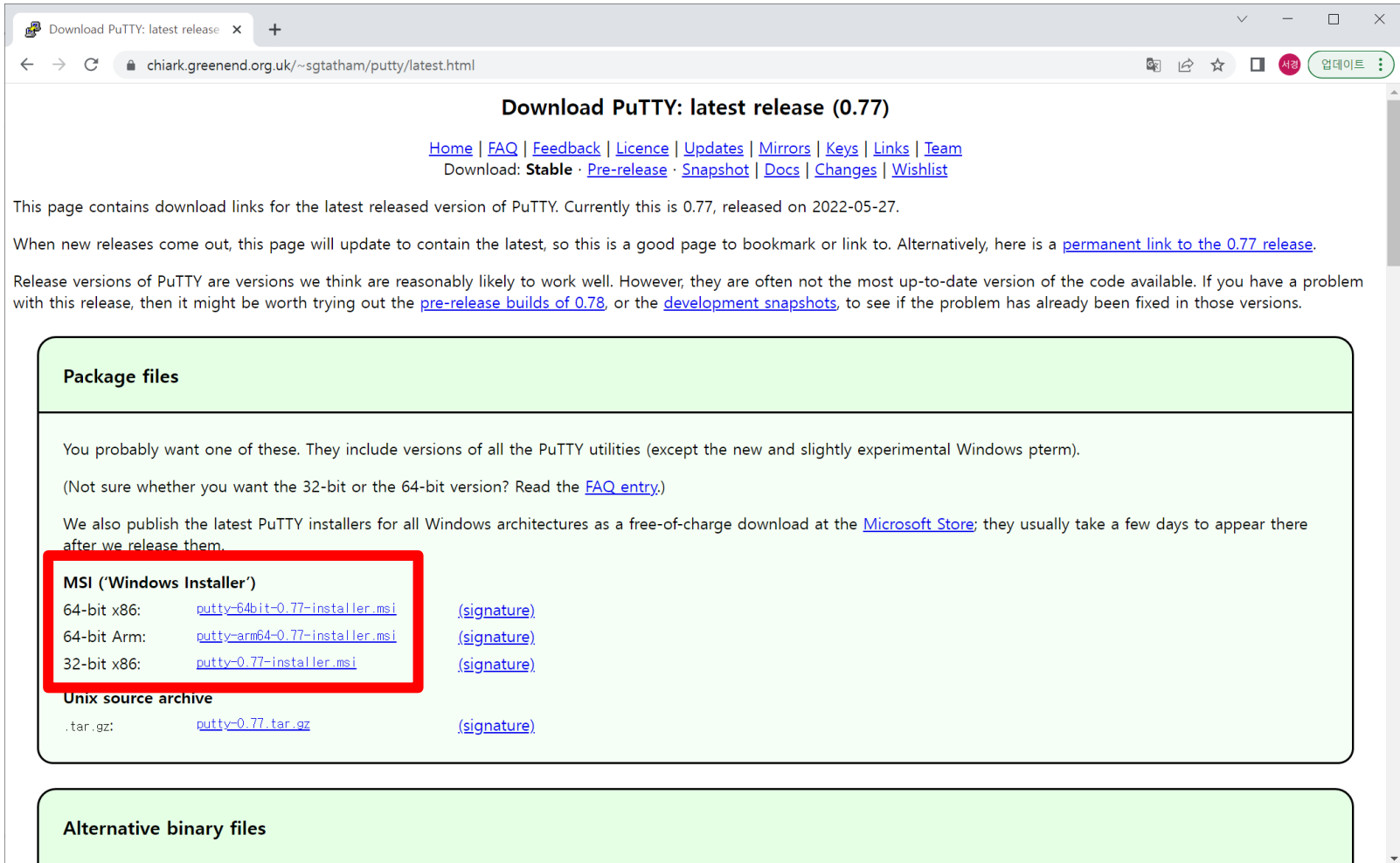
Bitvise SSH Client is **free to use**.

[Download Bitvise SSH Client](#)

Bitvise SSH Server

Bitvise SSH Server is an SSH, SFTP and SCP server for Windows. It is robust, easy to install, easy to use, and works well with a variety of SSH clients, including Bitvise SSH Client, OpenSSH, and PuTTY. The SSH Server is developed and supported professionally by Bitvise.

- Choose installer according to your PC environment (maybe almost **64-bit x86**)
- And execute installer



The screenshot shows a web browser window with the address bar displaying "Download PuTTY: latest release" and the URL "chiark.greenend.org.uk/~sgtatham/putty/latest.html". The page title is "Download PuTTY: latest release (0.77)". Below the title are navigation links: Home, FAQ, Feedback, Licence, Updates, Mirrors, Keys, Links, Team. There are also download links: Stable, Pre-release, Snapshot, Docs, Changes, Wishlist. The main text states: "This page contains download links for the latest released version of PuTTY. Currently this is 0.77, released on 2022-05-27. When new releases come out, this page will update to contain the latest, so this is a good page to bookmark or link to. Alternatively, here is a permanent link to the 0.77 release. Release versions of PuTTY are versions we think are reasonably likely to work well. However, they are often not the most up-to-date version of the code available. If you have a problem with this release, then it might be worth trying out the pre-release builds of 0.78, or the development snapshots, to see if the problem has already been fixed in those versions."

Package files

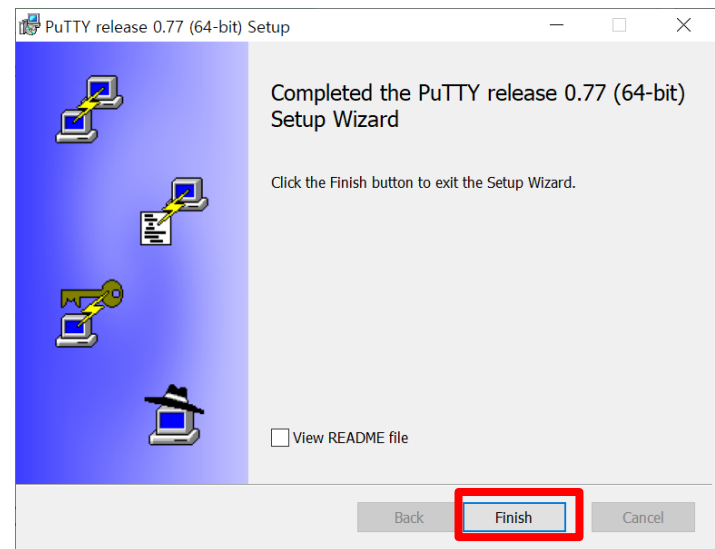
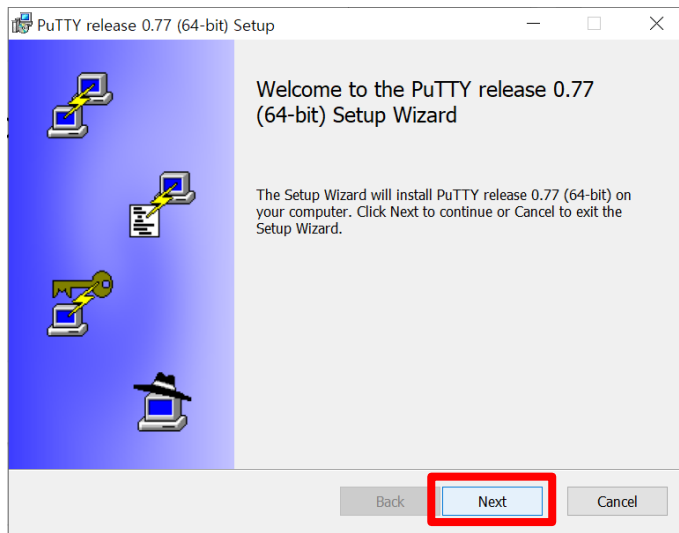
You probably want one of these. They include versions of all the PuTTY utilities (except the new and slightly experimental Windows pterm).
(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

We also publish the latest PuTTY installers for all Windows architectures as a free-of-charge download at the [Microsoft Store](#); they usually take a few days to appear there after we release them.

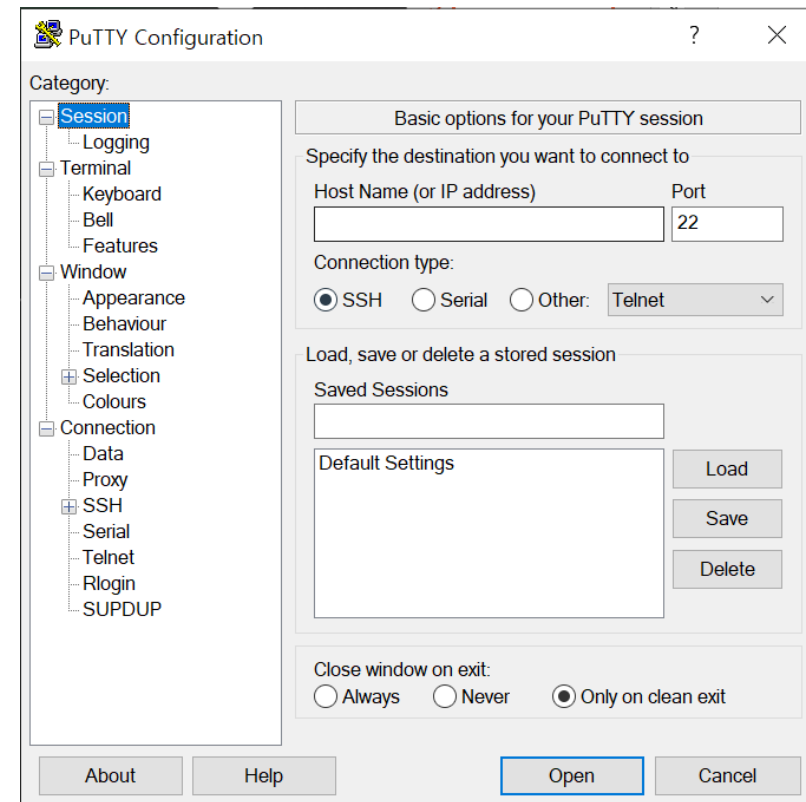
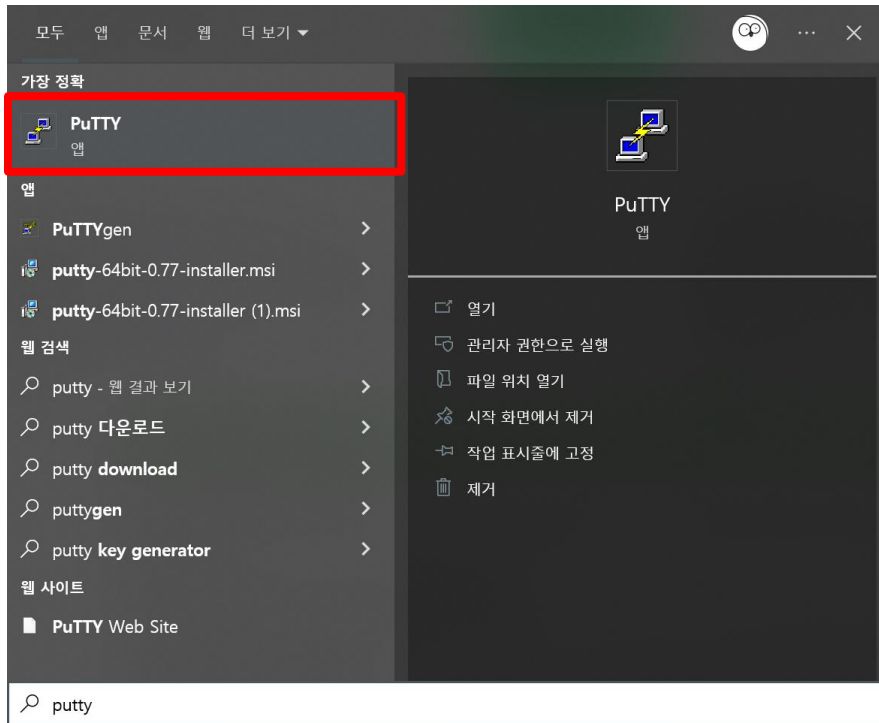
MSI ('Windows Installer')		
64-bit x86:	putty-64bit-0.77-installer.msi	(signature)
64-bit Arm:	putty-arm64-0.77-installer.msi	(signature)
32-bit x86:	putty-0.77-installer.msi	(signature)
Unix source archive		
.tar.gz:	putty-0.77.tar.gz	(signature)

Alternative binary files

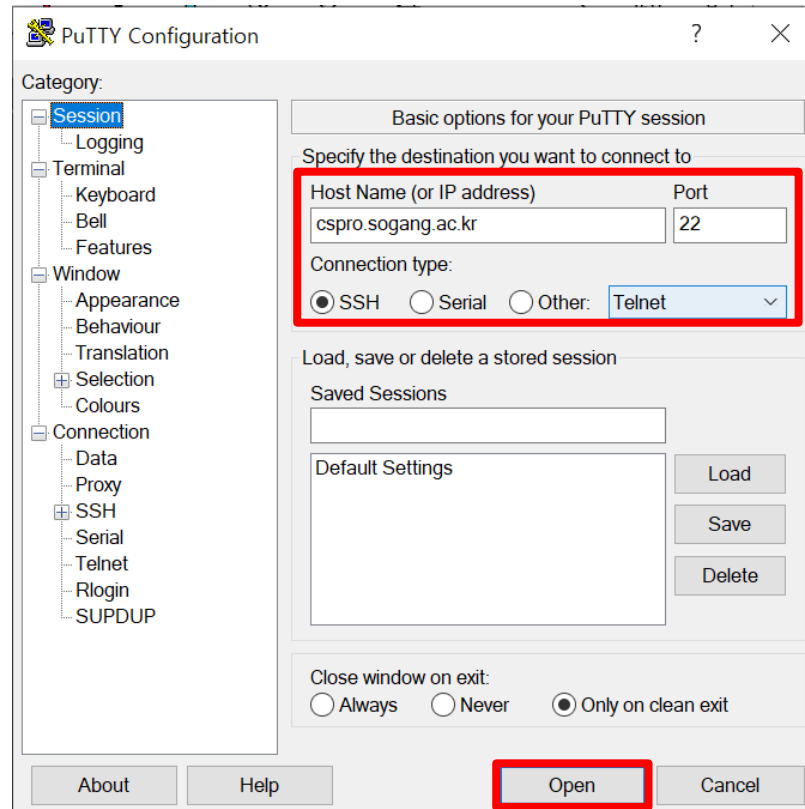
- Continue to press the next button and press finish after the installation is complete



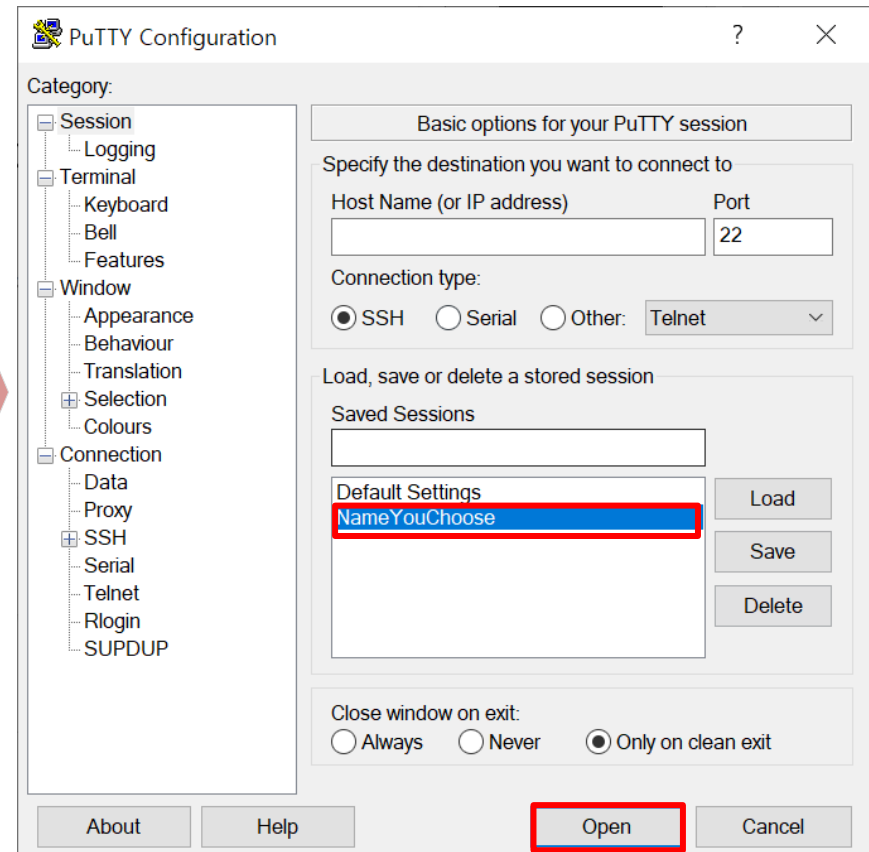
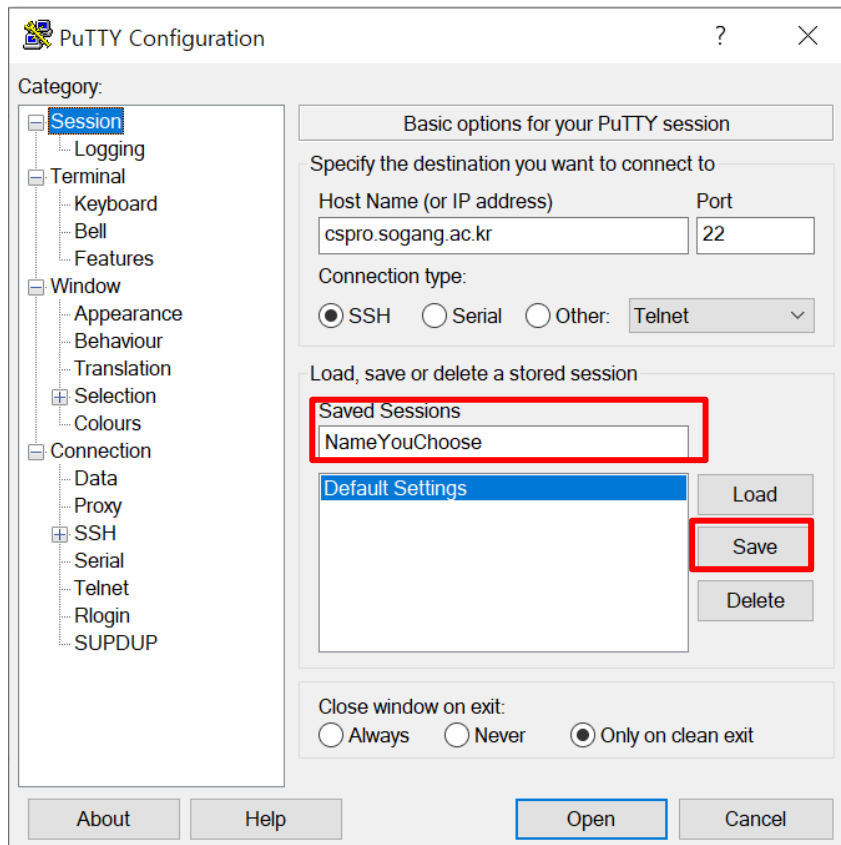
- Run PuTTY Application



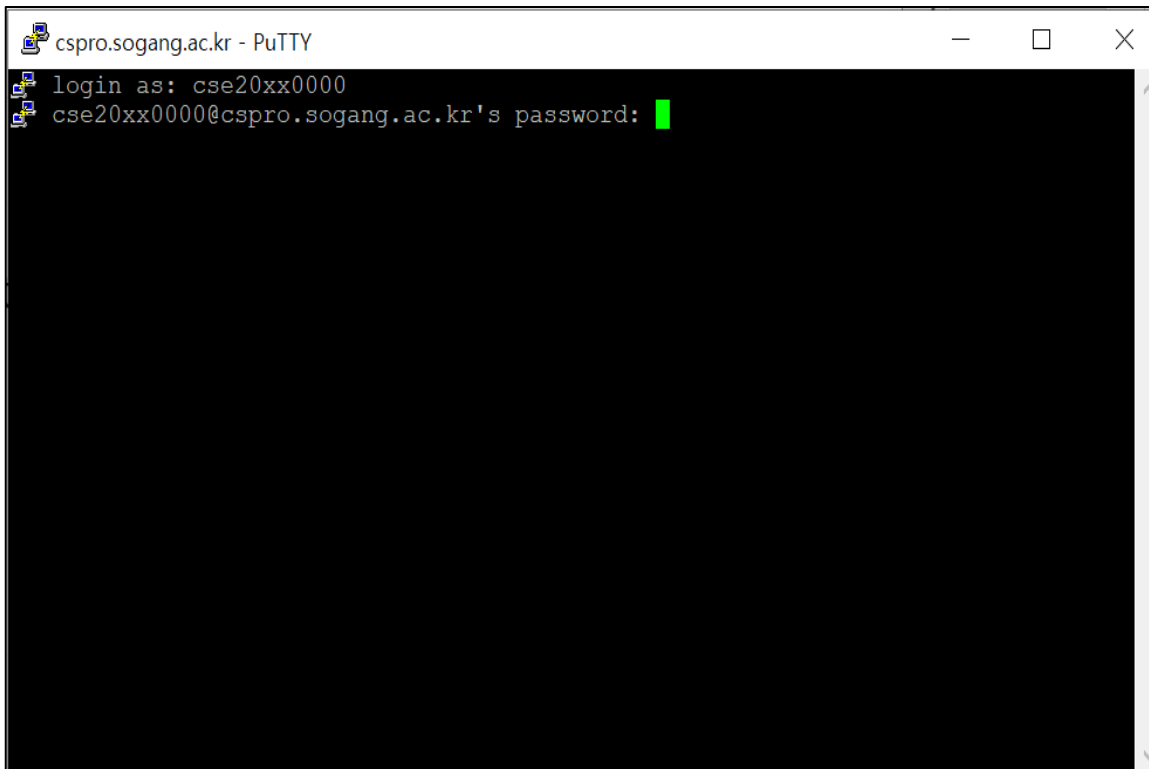
- **Setting in Session tap.**
 - Host Name : cspro.sogang.ac.kr (or cspro1~10.sogang.ac.kr. ex) cspro7.sogang.ac.kr)
 - Port: 22 (fixed)
 - Connexion type: SSH (fixed)
- **And press Open**



- If you don't want to set these settings every time you run PuTTY, you can save the settings.
 - Enter the settings described on the previous page, select the setting name under Saved Sessions
 - And press the Save button
- At the next PuTTY open, simply select the session name and press Open button.



- Enter your account ID + press 'Enter key'
 - ID: cse+student ID. Ex) cse20221234
- And Enter password + press 'Enter key' (it can't be seen as it is being typed)
 - Default password: sgcse3030@
 - If you are taking another class that uses CSPRO, your account may have been created with a different default password



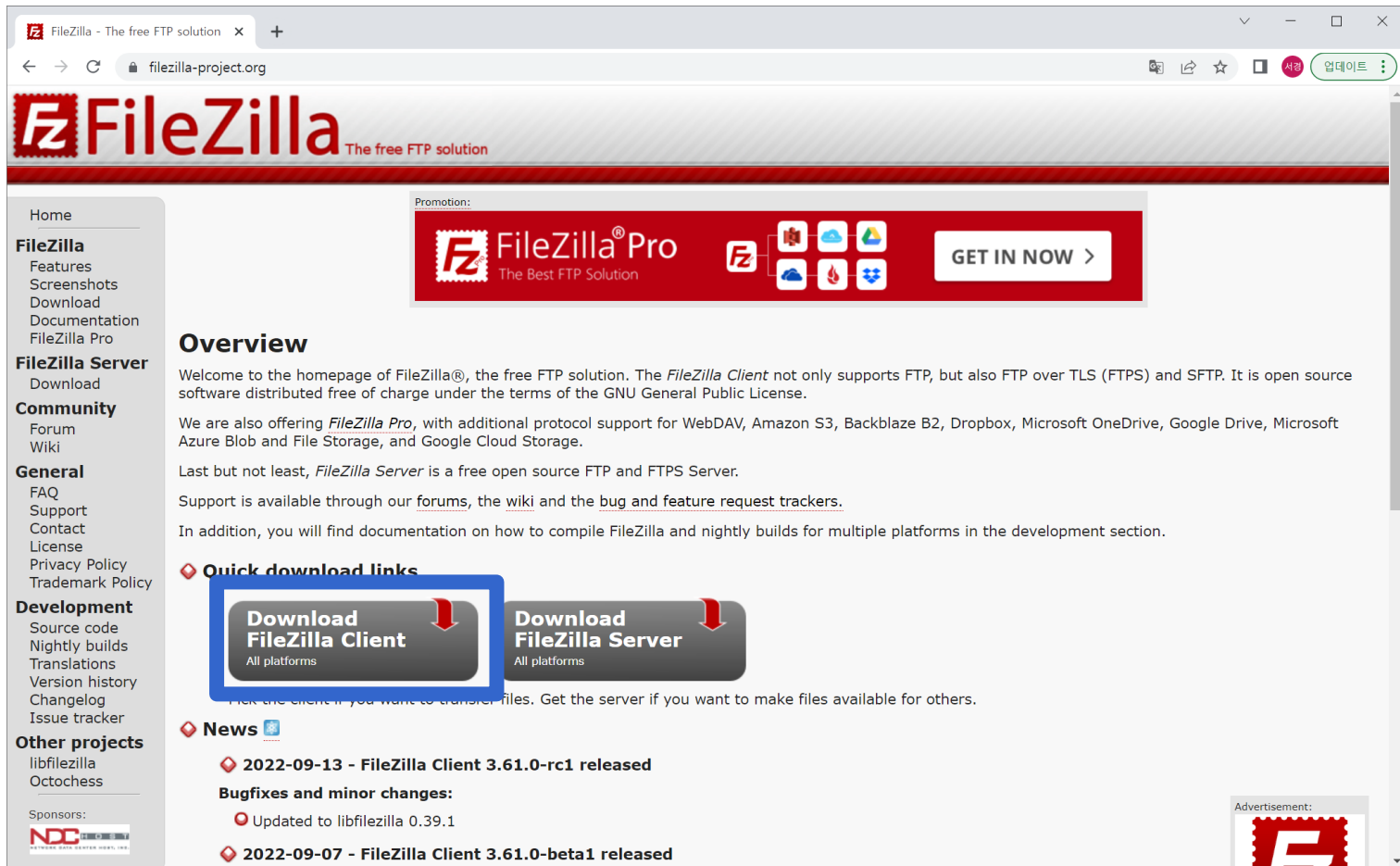
```
cspro.sogang.ac.kr - PuTTY
login as: cse20xx0000
cse20xx0000@cspro.sogang.ac.kr's password: [REDACTED]
```

- You MUST change your password

- Enter 'passwd' command
- and enter current password (the default password in the previous page)
- and enter your new password twice

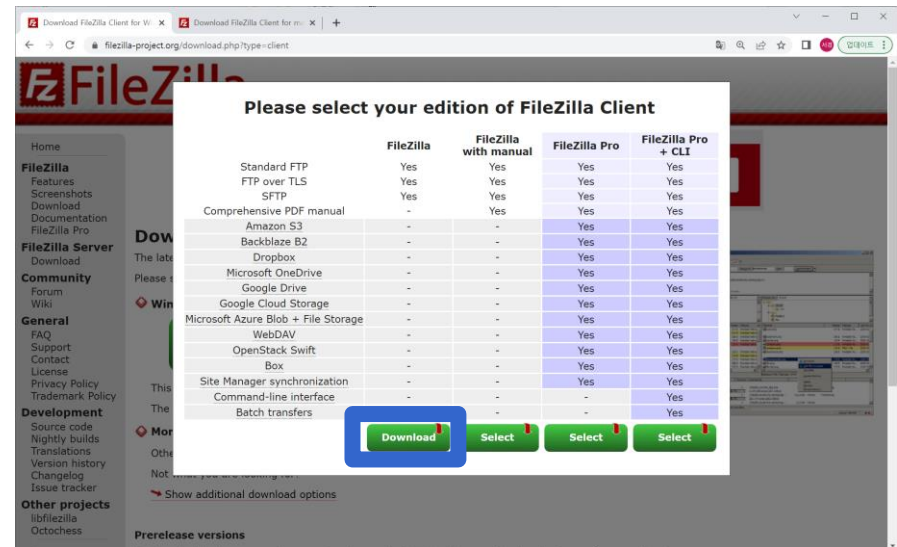
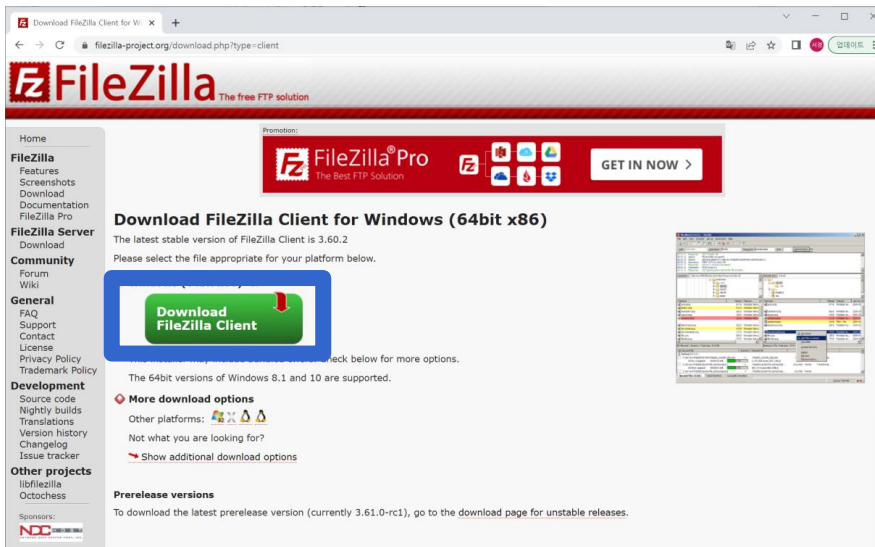
```
gr120210392@cspro: ~  
login as: gr120210392  
gr120210392@cspro.sogang.ac.kr's password:  
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.0-193-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/advantage  
  
241 packages can be updated.  
110 updates are security updates.  
  
New release '18.04.6 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Sun Sep 18 23:30:27 2022 from 163.239.24.81  
gr120210392@cspro:~$ passwd  
Enter login(LDAP) password:  
New password:  
Re-enter new password:  
LDAP password information changed for gr120210392  
passwd: password updated successfully  
gr120210392@cspro:~$
```

- FileZilla is FTP solution that can manage the files which is on server
- go to 'https://filezilla-project.org/' and click 'Download FileZilla Client'

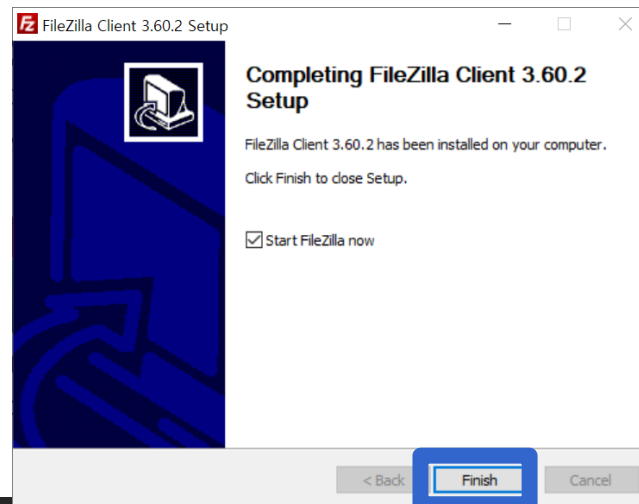
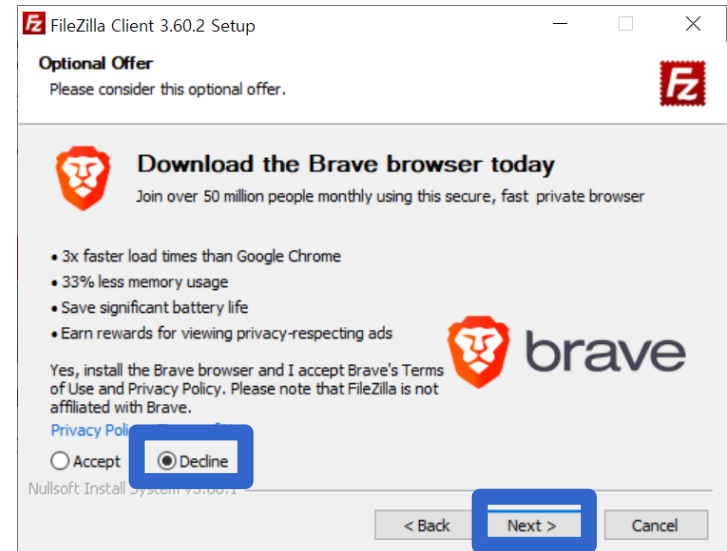


The screenshot shows the FileZilla website homepage. The browser address bar displays 'filezilla-project.org'. The page features a prominent red header with the FileZilla logo and the tagline 'The free FTP solution'. A navigation menu on the left lists various sections: Home, FileZilla (Features, Screenshots, Download, Documentation, FileZilla Pro), FileZilla Server (Download), Community (Forum, Wiki), General (FAQ, Support, Contact, License, Privacy Policy, Trademark Policy), Development (Source code, Nightly builds, Translations, Version history, Changelog, Issue tracker), and Other projects (libfilezilla, Octochess). A central promotional banner for 'FileZilla Pro' is visible, along with a 'GET IN NOW' button. The 'Overview' section welcomes visitors and describes the software's capabilities. The 'Quick download links' section highlights two buttons: 'Download FileZilla Client' and 'Download FileZilla Server', both labeled 'All platforms'. The 'News' section lists recent releases, including '2022-09-13 - FileZilla Client 3.61.0-rc1 released' and '2022-09-07 - FileZilla Client 3.61.0-beta1 released'. A sidebar on the left contains links to 'Sponsors' and 'NDC'.

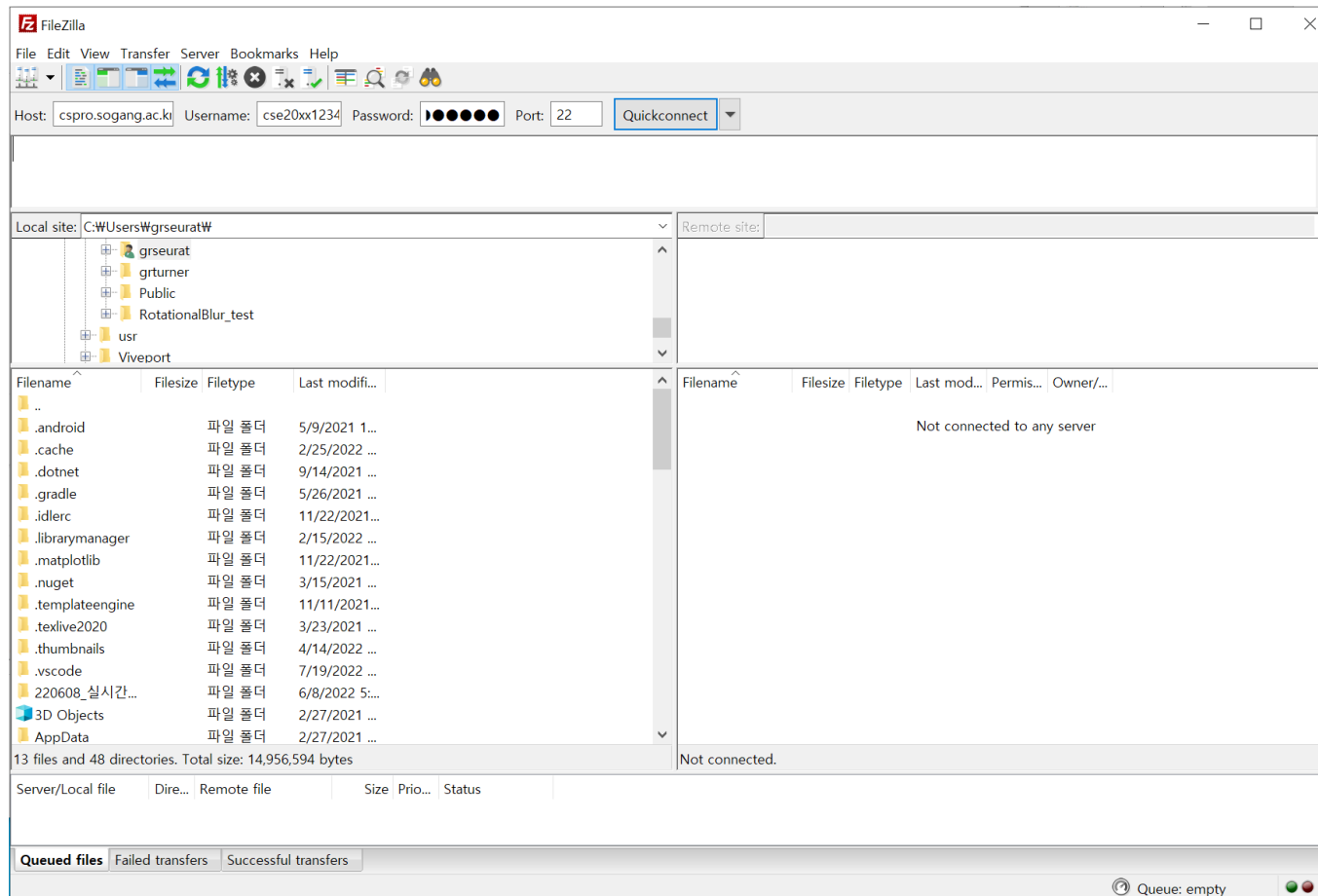
- Click Download FileZilla Client and Download button
- And execute after downloaded it



- Be careful, Press the decline button to prevent unnecessary Brave Brower installation
- After that, you can keep pressing the “next” button



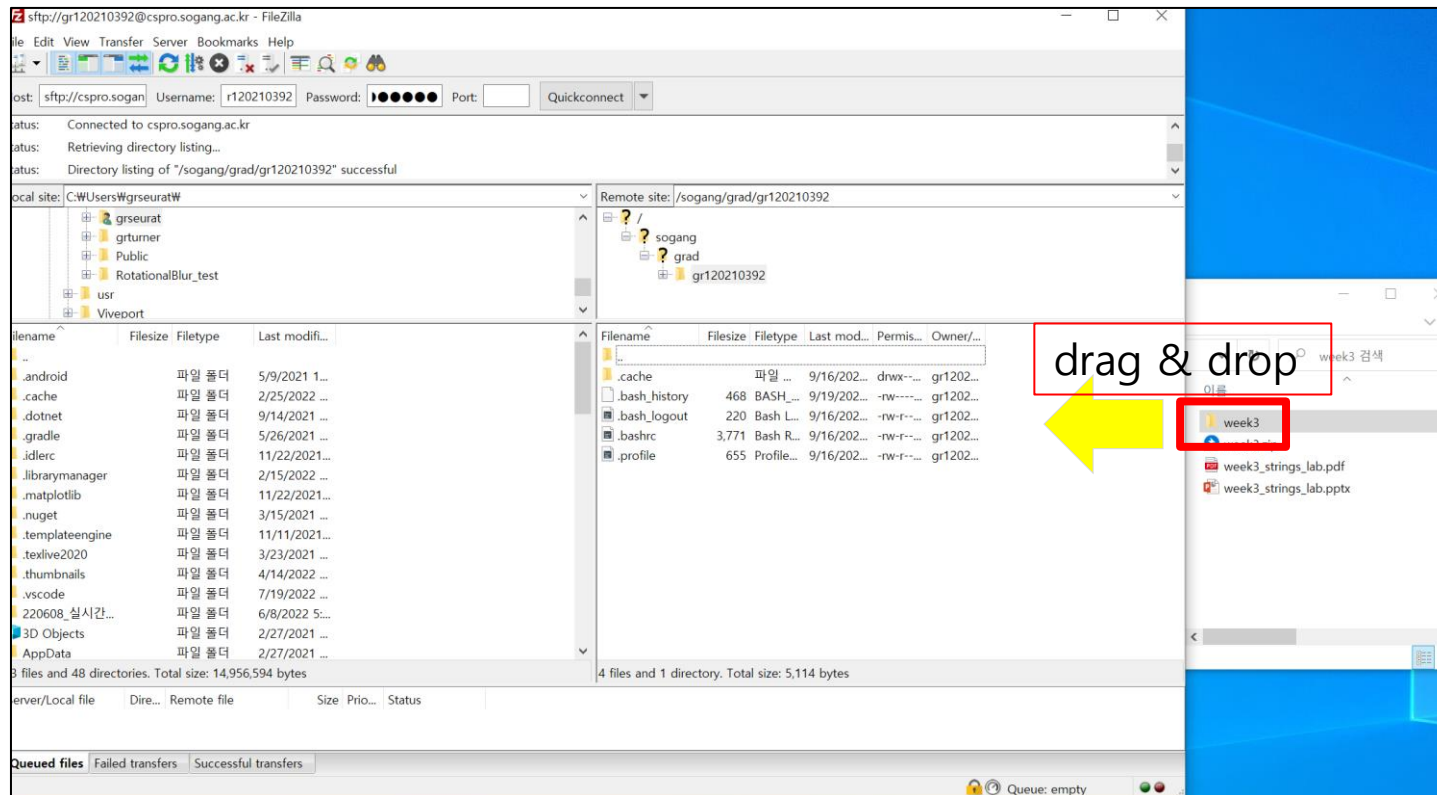
- Enter settings, select 'Quickconnect' button. (settings are same with PuTTY)
 - Host: cspro.sogang.ac.kr (or cspro1~10.sogang.ac.kr. ex) cspro7.sogang.ac.kr)
 - Username: ID(cse+studentID)
 - Password
 - Port: 22 (fixed)



- There is no file in the Linux server yet (we will learn about 'ls' command later)

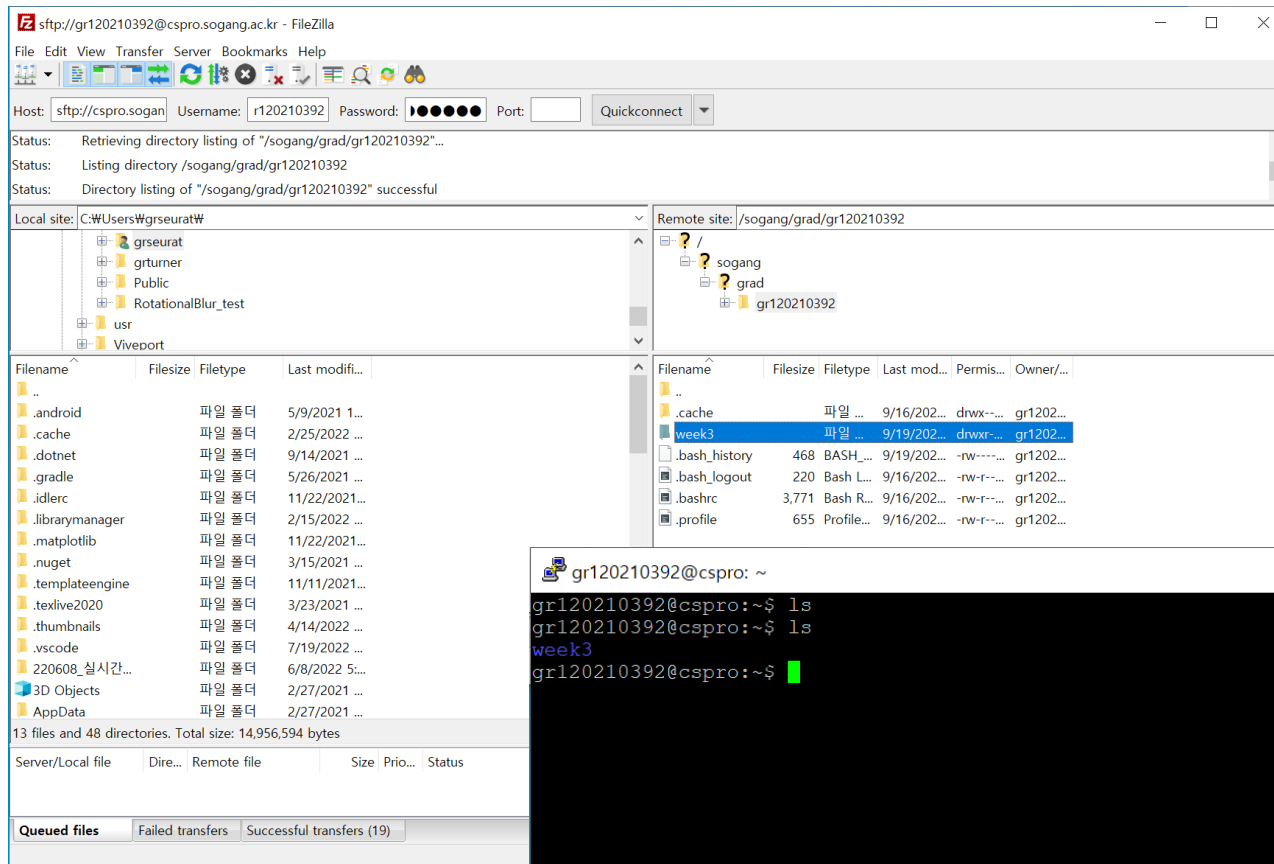
```
gr120210392@cspro: ~  
gr120210392@cspro:~$ ls  
gr120210392@cspro:~$
```

- Drag and drop the file you want to see on the Linux server



➤ copy file to cspro by FileZilla (For Windows)

- now you can your work on server

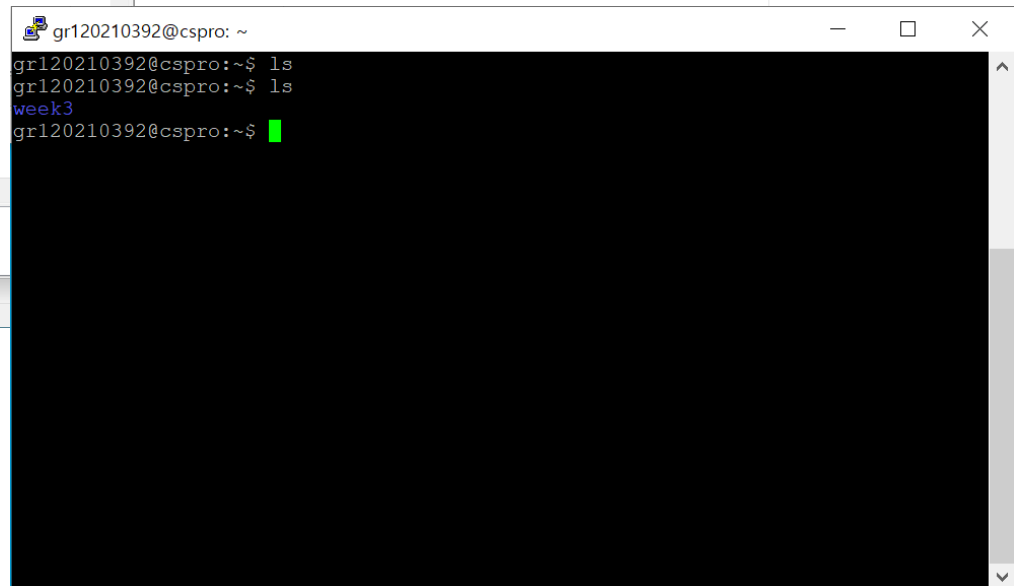


The screenshot shows the FileZilla interface with the following details:

- Title Bar:** sftp://gr120210392@cspro.sogang.ac.kr - FileZilla
- Menu Bar:** File, Edit, View, Transfer, Server, Bookmarks, Help
- Host:** sftp://cspro.sogan
- Username:** r120210392
- Password:** [Masked]
- Port:** [Empty]
- Quickconnect:** [Dropdown]
- Status:** Retrieving directory listing of "/sogang/grad/gr120210392"...
Status: Listing directory /sogang/grad/gr120210392
Status: Directory listing of "/sogang/grad/gr120210392" successful
- Local site:** C:\Users\Wgrseurat\
- Remote site:** /sogang/grad/gr120210392
- Local File List:**

Filename	Filesize	Filetype	Last modifi...
..			
.android		파일 폴더	5/9/2021 1...
.cache		파일 폴더	2/25/2022 ...
.dotnet		파일 폴더	9/14/2021 ...
.gradle		파일 폴더	5/26/2021 ...
.idlerc		파일 폴더	11/22/2021...
.librarymanager		파일 폴더	2/15/2022 ...
.matplotlib		파일 폴더	11/22/2021...
.nuget		파일 폴더	3/15/2021 ...
.templateengine		파일 폴더	11/11/2021...
.texlive2020		파일 폴더	3/23/2021 ...
.thumbnails		파일 폴더	4/14/2022 ...
.vscode		파일 폴더	7/19/2022 ...
220608_실시간...		파일 폴더	6/8/2022 5...
3D Objects		파일 폴더	2/27/2021 ...
AppData		파일 폴더	2/27/2021 ...
- Remote File List:**

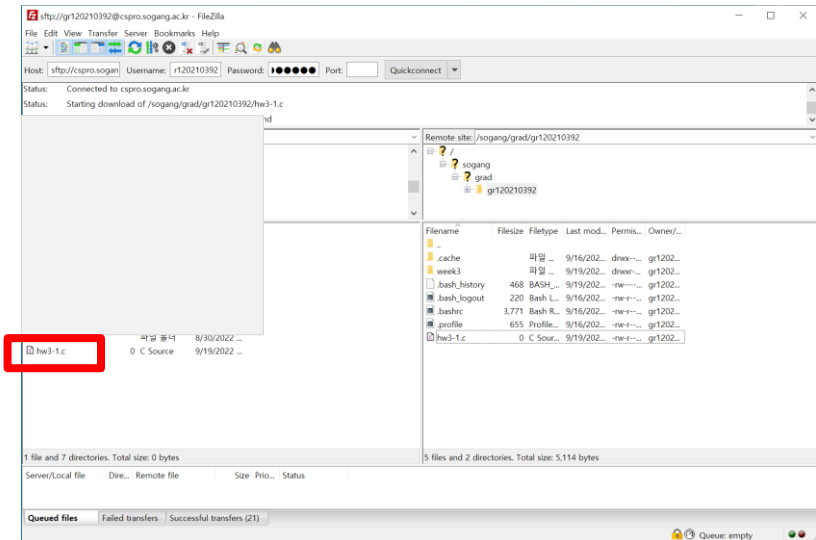
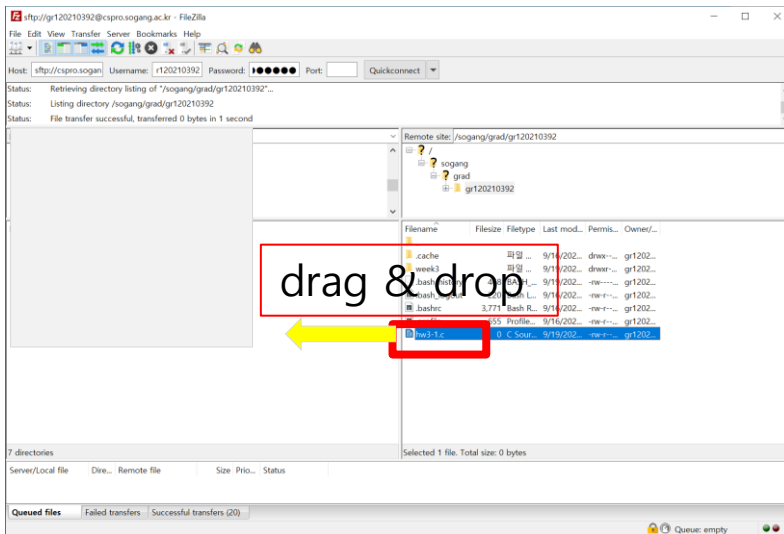
Filename	Filesize	Filetype	Last mod...	Permis...	Owner/...
..					
.cache		파일 ...	9/16/202...	drwx-...	gr1202...
week3		파일 ...	9/19/202...	drwxr-...	gr1202...
.bash_history	468	BASH...	9/19/202...	-rw-...	gr1202...
.bash_logout	220	Bash L...	9/16/202...	-rw-r-...	gr1202...
.bashrc	3,771	Bash R...	9/16/202...	-rw-r-...	gr1202...
.profile	655	Profile...	9/16/202...	-rw-r-...	gr1202...
- Footer:** 13 files and 48 directories. Total size: 14,956,594 bytes
- Transfer Queue:** Queued files, Failed transfers, Successful transfers (19)



```
gr120210392@cspro: ~  
gr120210392@cspro:~$ ls  
gr120210392@cspro:~$ ls  
week3  
gr120210392@cspro:~$
```

➤ download file from FileZilla (For Windows)

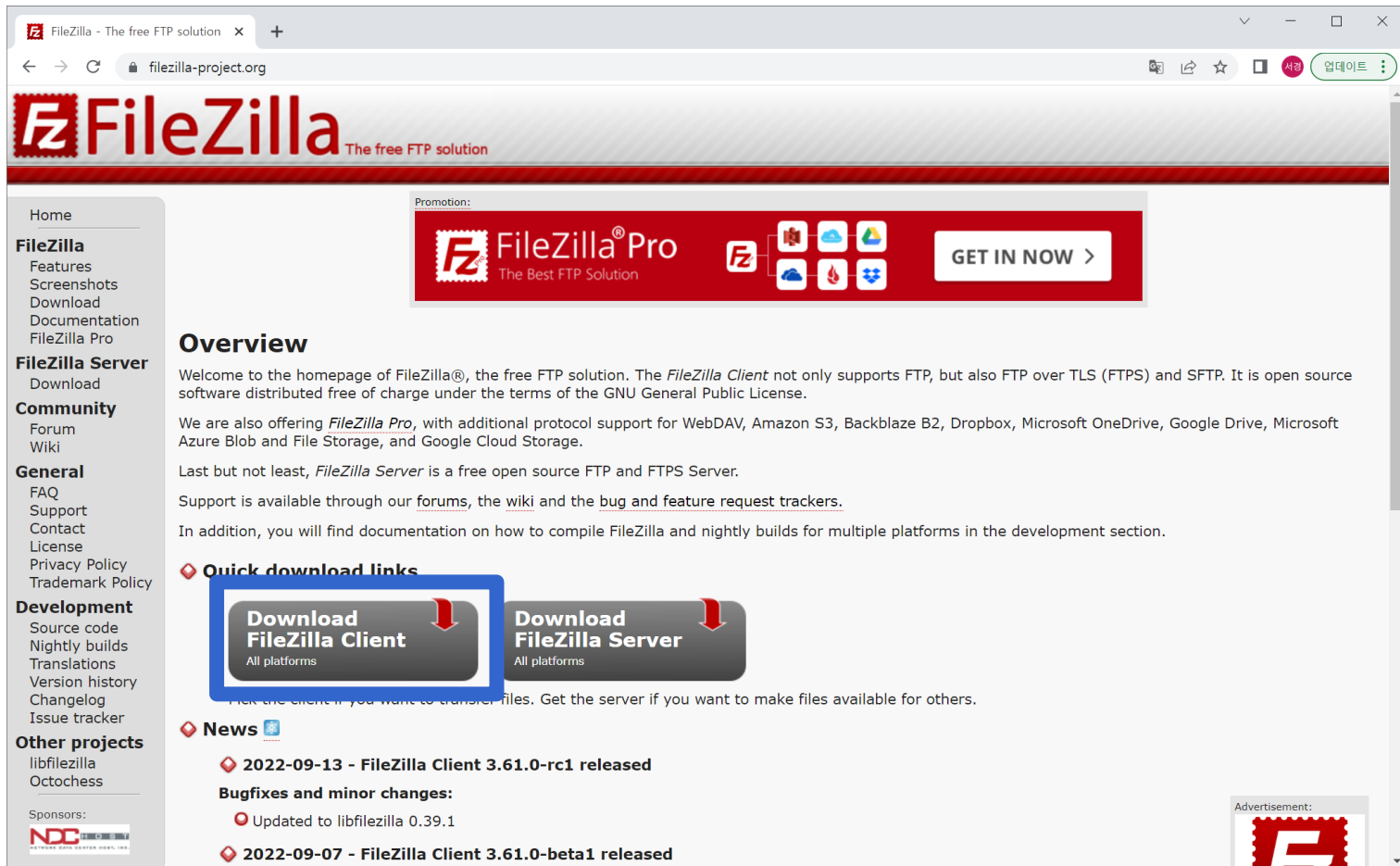
- To download file from server to your pc
- it is simple, just drag & drop Filezilla to your pc



Connecting to CSPRO (in Mac)

- In mac OS, **you don't need PuTTY.**
- You can connect to cspro by just opening built-in Terminal and type this
 - `ssh cseStuentID@cspro.sogang.ac.kr` (ex) `cse20xx1234@cspro.sogang.ac.kr`
 - Are you sure you want to continue connection (yes/no)? -> yes
- Next, enter your password to log in
 - Default password is given in page 10
- After log-in, change your password
 - See page 11

- FileZilla is FTP solution that can manage the files which is on server
- go to 'https://filezilla-project.org/' and click 'Download FileZilla Client'



The screenshot shows the FileZilla website homepage. The browser address bar displays 'filezilla-project.org'. The page features a prominent red header with the FileZilla logo and the tagline 'The free FTP solution'. A navigation menu on the left lists various sections: Home, FileZilla (Features, Screenshots, Download, Documentation, FileZilla Pro), FileZilla Server (Download), Community (Forum, Wiki), General (FAQ, Support, Contact, License, Privacy Policy, Trademark Policy), Development (Source code, Nightly builds, Translations, Version history, Changelog, Issue tracker), and Other projects (libfilezilla, Octochess). A central promotional banner for 'FileZilla Pro' includes a 'GET IN NOW' button. Below this, the 'Overview' section provides information about the software's capabilities and licensing. A 'Quick download links' section contains two buttons: 'Download FileZilla Client' (highlighted with a blue box and a red arrow) and 'Download FileZilla Server'. The 'News' section lists recent releases, including '2022-09-13 - FileZilla Client 3.61.0-rc1 released' and '2022-09-07 - FileZilla Client 3.61.0-beta1 released'. The bottom of the page includes a 'Sponsors' section with the NDC logo and an 'Advertisement' section with a FileZilla logo.

FileZilla - The free FTP solution

filezilla-project.org

FileZilla The free FTP solution

Home

FileZilla

- Features
- Screenshots
- Download
- Documentation
- FileZilla Pro

FileZilla Server

- Download

Community

- Forum
- Wiki

General

- FAQ
- Support
- Contact
- License
- Privacy Policy
- Trademark Policy

Development

- Source code
- Nightly builds
- Translations
- Version history
- Changelog
- Issue tracker

Other projects

- libfilezilla
- Octochess

Sponsors:

NDC

Advertisement:

FileZilla Pro The Best FTP Solution

GET IN NOW >

Overview

Welcome to the homepage of FileZilla®, the free FTP solution. The *FileZilla Client* not only supports FTP, but also FTP over TLS (FTPS) and SFTP. It is open source software distributed free of charge under the terms of the GNU General Public License.

We are also offering *FileZilla Pro*, with additional protocol support for WebDAV, Amazon S3, Backblaze B2, Dropbox, Microsoft OneDrive, Google Drive, Microsoft Azure Blob and File Storage, and Google Cloud Storage.

Last but not least, *FileZilla Server* is a free open source FTP and FTPS Server.

Support is available through our [forums](#), the [wiki](#) and the [bug](#) and [feature request](#) trackers.

In addition, you will find documentation on how to compile FileZilla and nightly builds for multiple platforms in the development section.

Quick download links

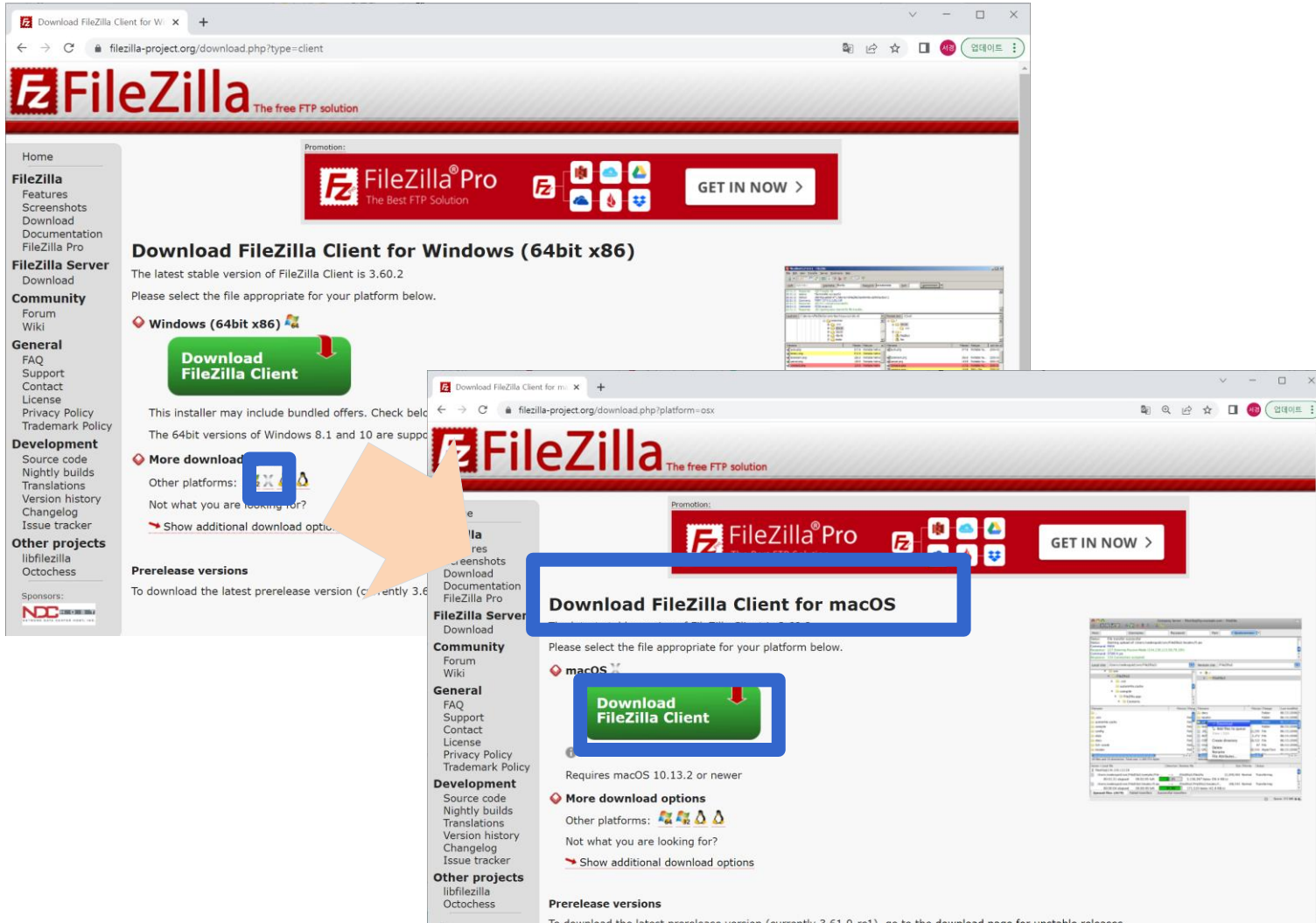
Download FileZilla Client
All platforms

Download FileZilla Server
All platforms

News

- 2022-09-13 - FileZilla Client 3.61.0-rc1 released
- Bugfixes and minor changes:
 - Updated to libfilezilla 0.39.1
- 2022-09-07 - FileZilla Client 3.61.0-beta1 released

- Click 'X' Icon (blue boxed) and redirect to download for mac page
- And click 'Download FileZilla Client' button
- And execute after downloaded it



The image shows two browser windows illustrating the steps to download FileZilla for macOS. The top window displays the FileZilla website's download page for Windows (64bit x86). A blue box highlights the 'X' icon in the 'Other platforms' section. The bottom window shows the 'Download FileZilla Client for macOS' page, with a blue box highlighting the 'Download FileZilla Client' button. An orange arrow points from the 'X' icon in the top window to the macOS download page in the bottom window.

FileZilla The free FTP solution

Download FileZilla Client for Windows (64bit x86)

The latest stable version of FileZilla Client is 3.60.2




Please select the file appropriate for your platform below.

Windows (64bit x86)

Download FileZilla Client

This installer may include bundled offers. Check before installing.

The 64bit versions of Windows 8.1 and 10 are supported.

Other platforms:   

Not what you are looking for?

Show additional download options

Prerelease versions

To download the latest prerelease version (currently 3.61.0-rc1), go to the download page for unstable releases

FileZilla The free FTP solution

Download FileZilla Client for macOS




Please select the file appropriate for your platform below.

macOS

Download FileZilla Client

Requires macOS 10.13.2 or newer

More download options

Other platforms:   

Not what you are looking for?

Show additional download options

Prerelease versions

To download the latest prerelease version (currently 3.61.0-rc1), go to the download page for unstable releases

- click once more 'Download' button

Please select your edition of FileZilla Client

	FileZilla	FileZilla with manual	FileZilla Pro
Standard FTP	Yes	Yes	Yes
FTP over TLS	Yes	Yes	Yes
SFTP	Yes	Yes	Yes
Comprehensive PDF manual	-	Yes	Yes
Amazon S3	-	-	Yes
Backblaze B2	-	-	Yes
Dropbox	-	-	Yes
Microsoft OneDrive	-	-	Yes
Google Drive	-	-	Yes
Google Cloud Storage	-	-	Yes
Microsoft Azure Blob and File Storage	-	-	Yes
WebDAV	-	-	Yes
OpenStack Swift	-	-	Yes
Box	-	-	Yes
Site Manager synchronization	-	-	Yes

[Download](#)
[Select](#)
[Download on the Mac App Store](#)

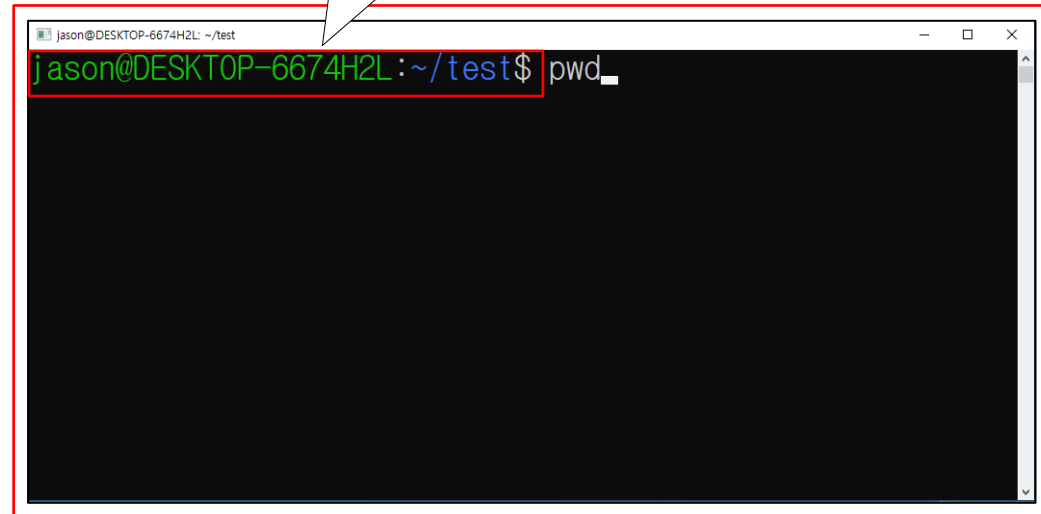
- Next steps to connect to cspro by FileZilla is almost same with Windows(12page ~)

Basic Linux commands and Usages

- **Terminal** is an environment (interface) where a user can type text commands
- **Shell** is a program that interacts with you: it takes in a command from a user and passes it to the operating system (Linux here) to perform some task
- So, roughly speaking:

This whole
part is
terminal

And this specific
program is *shell*



```
jason@DESKTOP-6674H2L: ~/test$ pwd
```

- **pwd** : print (current) working directory
- **cd** : change directory
 - **cd** : change directory to your home directory
 - **cd [dir_name]** : change directory to directory named "dir_name"
 - **cd ..** : change directory to parent directory
- **ls** : print file list in the current directory
 - **ls -a** : print even hidden files (files that begin with .(dot))
 - **ls -l** : print detail information of files. (type, permission, link, owner, group, size, last modification time)

```
gr120210392@cspro10: ~  
gr120210392@cspro10:~$ pwd  
/sogang/grad/gr120210392  
gr120210392@cspro10:~$
```

pwd command

```
gr120210392@cspro10: ~  
gr120210392@cspro10:~$ cd test  
gr120210392@cspro10:~/test$ pwd  
/sogang/grad/gr120210392/test  
gr120210392@cspro10:~/test$ cd ..  
gr120210392@cspro10:~$ pwd  
/sogang/grad/gr120210392  
gr120210392@cspro10:~$
```

cd command

```
gr120210392@cspro10: ~/test  
gr120210392@cspro10:~/test$ ls  
gr120210392@cspro10:~/test$ vi new.c  
gr120210392@cspro10:~/test$ ls  
new.c  
gr120210392@cspro10:~/test$ ls -a  
.  ..  new.c  
gr120210392@cspro10:~/test$ ls -l  
total 0  
-rw-r--r-- 1 gr120210392 grad 0 Mar  6 18:33 new.c  
gr120210392@cspro10:~/test$
```

ls command

- **cat** : concatenates inputs and prints on the screen
 - **cat [filename]** : print the contents of filename
- **cp** : copy files
 - **cp [filename1] [filename2]** : copy filename1 to filename2
 - **cp [filename1] [dir1/filename2]** : copy filename1 to filename2 in the directory dir1
- **mv** : move and rename files
 - **mv [filename1] [filename2]** : move filename1 to filename2
 - **mv [filename] ..** : move filename to parent directory

```
gr120210392@csp10: ~/test
gr120210392@csp10:~/test$ cat new.c
Hello World!
```

cat command

```
gr120210392@csp10: ~/test
gr120210392@csp10:~/test$ cp new.c new2.c
gr120210392@csp10:~/test$ ls
new2.c new.c
gr120210392@csp10:~/test$ cat new2.c
Hello World!
```

cp command

```
gr120210392@csp10: ~/test
gr120210392@csp10:~/test$ ls
new.c
gr120210392@csp10:~/test$ mv new.c a.c
gr120210392@csp10:~/test$ ls
a.c
gr120210392@csp10:~/test$ cat a.c
Hello World!
gr120210392@csp10:~/test$
```

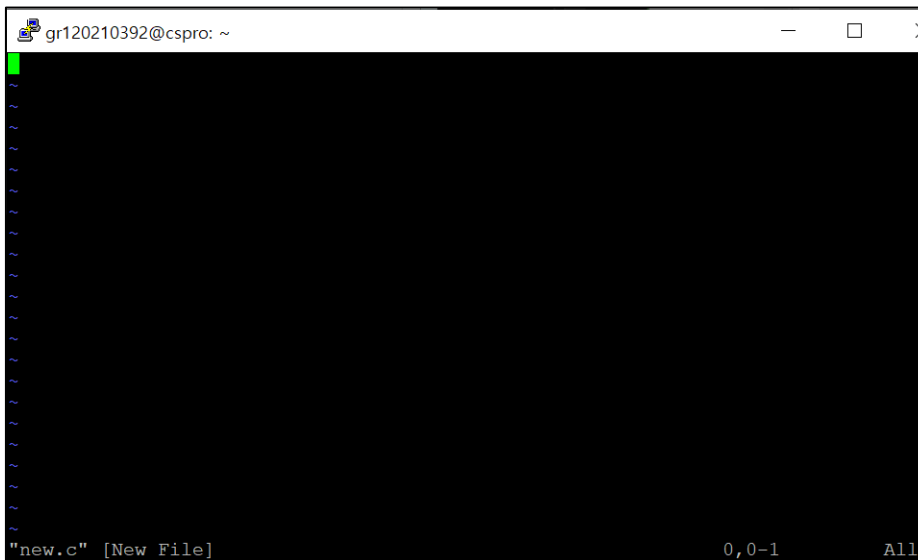
mv command

- when permission denied, you can modify permission of the file(or directory)
- you can use 'chmod -r 777 [directory name]'
 - -r option means apply to every below directory and files in [directory name]
 - 777 option means apply Read/Write/Execute(all) permission for Owner/Group/Public user(all)
 - for more information of chmod, refer <https://linuxize.com/post/chmod-command-in-linux/> and <https://recipes4dev.tistory.com/175>

```
gr120210392@cspro: ~/week3
gr120210392@cspro:~/week3$ ls
exercise hw3-1 hw3-2 hw3-3
gr120210392@cspro:~/week3$ cd exercise/
-bash: cd: exercise/: Permission denied
gr120210392@cspro:~/week3$
```

```
gr120210392@cspro: ~/week3/exercise
gr120210392@cspro:~/week3$ ls
exercise hw3-1 hw3-2 hw3-3
gr120210392@cspro:~/week3$ cd exercise/
-bash: cd: exercise/: Permission denied
gr120210392@cspro:~/week3$ chmod -R 777 exercise/
gr120210392@cspro:~/week3$ cd exercise/
gr120210392@cspro:~/week3/exercise$ ls
ex.bin ex.c input-1.txt input-2.txt Makefile
gr120210392@cspro:~/week3/exercise$
```

- 
- A terminal window with a title bar. The title bar contains a small icon on the left and three window control buttons (minimize, maximize, close) on the right. The terminal text shows the prompt `gr120210392@cspro: ~` on the first line and the command `gr120210392@cspro:~$ vi new.c` on the second line. A green cursor is positioned at the end of the command.

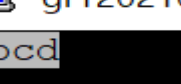


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- 
- The screenshot shows a terminal window with a light blue title bar. The title bar text is "gr120210392@cspro: ~". The terminal content shows a prompt character "~" followed by the command "abcd" on the first line. The second line shows a prompt character "~" followed by a red cursor block. The third line shows a prompt character "~". The fourth line shows a prompt character "~". The fifth line shows a prompt character "~". The sixth line shows a prompt character "~". The seventh line shows a prompt character "~". The eighth line shows a prompt character "~". The ninth line shows a prompt character "~". The tenth line shows a prompt character "~". The eleventh line shows a prompt character "~". The twelfth line shows a prompt character "~". The thirteenth line shows a prompt character "~". The fourteenth line shows a prompt character "~". The fifteenth line shows a prompt character "~". The sixteenth line shows a prompt character "~". The seventeenth line shows a prompt character "~". The eighteenth line shows a prompt character "~". The nineteenth line shows a prompt character "~". The twentieth line shows a prompt character "~". The twenty-first line shows a prompt character "~". The twenty-second line shows a prompt character "~". The twenty-third line shows a prompt character "~". The twenty-fourth line shows a prompt character "~". The twenty-fifth line shows a prompt character "~". The twenty-sixth line shows a prompt character "~". The twenty-seventh line shows a prompt character "~". The twenty-eighth line shows a prompt character "~". The twenty-ninth line shows a prompt character "~". The thirtieth line shows a prompt character "~". The thirty-first line shows a prompt character "~". The thirty-second line shows a prompt character "~". The thirty-third line shows a prompt character "~". The thirty-fourth line shows a prompt character "~". The thirty-fifth line shows a prompt character "~". The thirty-sixth line shows a prompt character "~". The thirty-seventh line shows a prompt character "~". The thirty-eighth line shows a prompt character "~". The thirty-ninth line shows a prompt character "~". The fortieth line shows a prompt character "~". The forty-first line shows a prompt character "~". The forty-second line shows a prompt character "~". The forty-third line shows a prompt character "~". The forty-fourth line shows a prompt character "~". The forty-fifth line shows a prompt character "~". The forty-sixth line shows a prompt character "~". The forty-seventh line shows a prompt character "~". The forty-eighth line shows a prompt character "~". The forty-ninth line shows a prompt character "~". The fiftieth line shows a prompt character "~". The fifty-first line shows a prompt character "~". The fifty-second line shows a prompt character "~". The fifty-third line shows a prompt character "~". The fifty-fourth line shows a prompt character "~". The fifty-fifth line shows a prompt character "~". The fifty-sixth line shows a prompt character "~". The fifty-seventh line shows a prompt character "~". The fifty-eighth line shows a prompt character "~". The fifty-ninth line shows a prompt character "~". The sixtieth line shows a prompt character "~". The sixty-first line shows a prompt character "~". The sixty-second line shows a prompt character "~". The sixty-third line shows a prompt character "~". The sixty-fourth line shows a prompt character "~". The sixty-fifth line shows a prompt character "~". The sixty-sixth line shows a prompt character "~". The sixty-seventh line shows a prompt character "~". The sixty-eighth line shows a prompt character "~". The sixty-ninth line shows a prompt character "~". The seventieth line shows a prompt character "~". The seventy-first line shows a prompt character "~". The seventy-second line shows a prompt character "~". The seventy-third line shows a prompt character "~". The seventy-fourth line shows a prompt character "~". The seventy-fifth line shows a prompt character "~". The seventy-sixth line shows a prompt character "~". The seventy-seventh line shows a prompt character "~". The seventy-eighth line shows a prompt character "~". The seventy-ninth line shows a prompt character "~". The eightieth line shows a prompt character "~". The eighty-first line shows a prompt character "~". The eighty-second line shows a prompt character "~". The eighty-third line shows a prompt character "~". The eighty-fourth line shows a prompt character "~". The eighty-fifth line shows a prompt character "~". The eighty-sixth line shows a prompt character "~". The eighty-seventh line shows a prompt character "~". The eighty-eighth line shows a prompt character "~". The eighty-ninth line shows a prompt character "~". The ninetieth line shows a prompt character "~". The ninety-first line shows a prompt character "~". The ninety-second line shows a prompt character "~". The ninety-third line shows a prompt character "~". The ninety-fourth line shows a prompt character "~". The ninety-fifth line shows a prompt character "~". The ninety-sixth line shows a prompt character "~". The ninety-seventh line shows a prompt character "~". The ninety-eighth line shows a prompt character "~". The ninety-ninth line shows a prompt character "~". The hundredth line shows a prompt character "~".



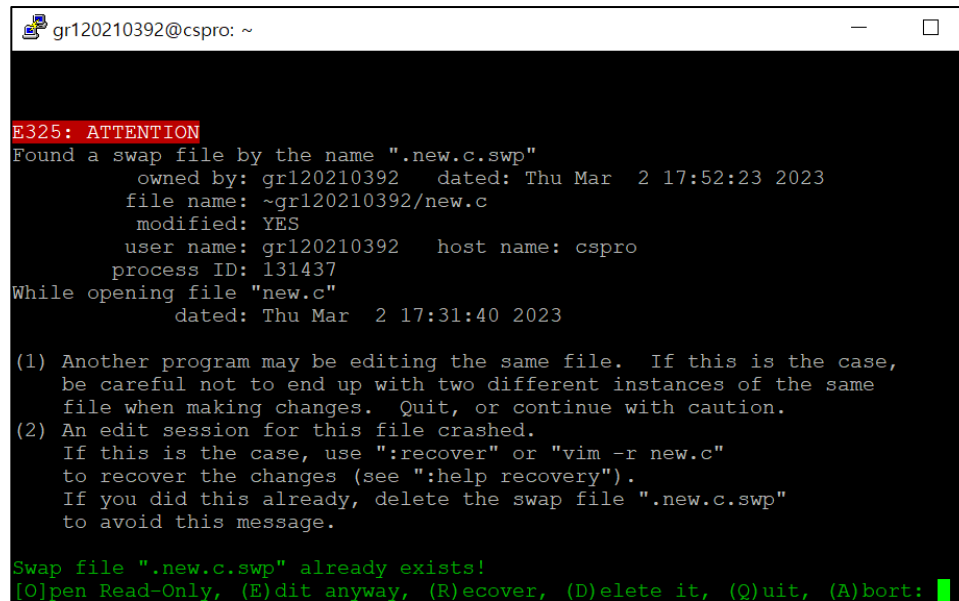
A terminal window with a black background. The title bar shows a computer icon and the text "gr120210392@cspro: ~". The terminal content shows the command "abcd" being entered on the first line. Subsequent lines show blue tilde characters (~) as output. The prompt ": w" is visible at the bottom left, with a green cursor block.



The screenshot shows a terminal window with a black background. At the top, there is a shell prompt consisting of a computer icon followed by the text "gr120210392@cspro: ~". Below the prompt, the command "abcd" has been entered and is highlighted with a light blue selection box. The first character 'a' is highlighted in red. Below the command, there are several tilde characters (~) on separate lines, indicating a scrollable history or output. At the bottom of the terminal, the text "-- VISUAL --" is displayed.

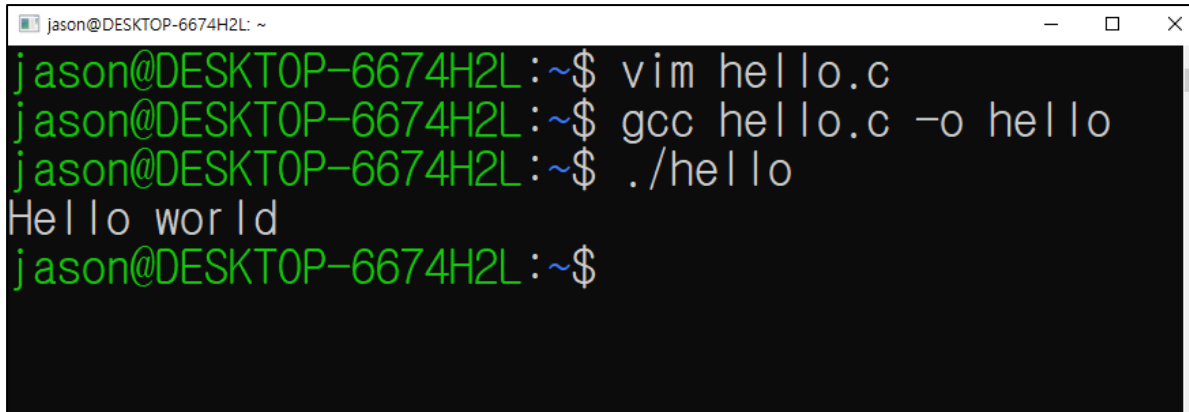
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- You can also copy & paste using mouse drag(copy) & right click(paste)
- You can delete one character by press 'd' in normal mode or visual mode
 - also you can delete a line by press 'dd' in normal mode or visual mode (useful)
- A swp file can be created if:
 - If you are shutting down abnormally after modifying a file. (for example, if terminal shut down)
 - When other people(or you) open a file that you are already working on
 - etc.
- swp(swap) files store changes you've made to the files. It can be used when you want to recover the files.
 - if swp file is created and situation like the picture below occurs, select operation you want to do.



```
gr120210392@cspiro: ~  
  
E325: ATTENTION  
Found a swap file by the name ".new.c.swp"  
  owned by: gr120210392   dated: Thu Mar  2 17:52:23 2023  
  file name: ~gr120210392/new.c  
  modified: YES  
  user name: gr120210392   host name: cspiro  
  process ID: 131437  
While opening file "new.c"  
   dated: Thu Mar  2 17:31:40 2023  
  
(1) Another program may be editing the same file.  If this is the case,  
    be careful not to end up with two different instances of the same  
    file when making changes.  Quit, or continue with caution.  
(2) An edit session for this file crashed.  
    If this is the case, use ":recover" or "vim -r new.c"  
    to recover the changes (see ":help recovery").  
    If you did this already, delete the swap file ".new.c.swp"  
    to avoid this message.  
  
Swap file ".new.c.swp" already exists!  
[O]pen Read-Only, (E)dit anyway, (R)ecover, (D)elete it, (Q)uit, (A)bort: █
```


- Once you write a program with an editor, you have to compile it
- “Compile” is the process of translating your source code into an *executable* file
- In Linux, GCC will do this for us
- There are many options in GCC, but for now it is enough to know the following:
\$ gcc <source file> -o <output executable file>
- For example, the following commands compile “hello.c” into an executable file named “hello”



```
jason@DESKTOP-6674H2L: ~  
jason@DESKTOP-6674H2L:~$ vim hello.c  
jason@DESKTOP-6674H2L:~$ gcc hello.c -o hello  
jason@DESKTOP-6674H2L:~$ ./hello  
Hello world  
jason@DESKTOP-6674H2L:~$
```

- Now you can work your works on Linux
- If you want to more help and know other commands, refer below page
- Linux tutorial
 - <https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners>
- Linux commands
 - <https://personales.unican.es/corcuerp/Linux/commands/Bash%20Command%20Reference.html>
- Vim tutorial
 - <https://www.freecodecamp.org/news/vim-beginners-guide/>
- Vim commands
 - <https://www.phcomp.co.uk/Tutorials/Unix-And-Linux/Vi-and-vim-reference-sheet.html>