C Programming Environments

COMP319 Algorithms 1

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Overview

- Suggestions for C programming environments
  - Linux (evaluation standards)
    - Account setting
    - Connecting to the Linux server with SSH clients
    - Editor suggestions
  - Offline compilers
    - Code::Blocks,
      - But check your code with linux before submission
- Notes
  - 채점기준: Ubuntu linux 16.04, gcc 5.4.0 20160609
  - Linux server가 제공되며 사용이 강하게 권장됨
    - Account (계정) 제공됨
  - 다른 IDE를 사용해도 되지만 제출전에 위의 linux 에서 검증해 보기를 바랍니다.

Why C only?

- C언어는 가장 효율적인 코딩이 가능하게 하며 따라서 embedded device 등에서는 C 컴파일러만을 제공하는 경우도 많다.
- 다른 언어들은 나중에 사장되는 경우도 많지만 C 언어는 50년 가까이 사용되었으며 앞으로도 계속 사용될 것으로 예상된다.
- 많은 취업시험에서 코딩 테스트는 알고리즘+C언어 구현으로 주어진다.
- 컴퓨터 구조 등에 대한 이해를 도와준다.
- C언어 복습이 필요함.

Linux Environment (1)

- Linux is a powerful OS that provides a good multi-user, shared environments.
  - Provides NATURAL programming environments
    - Linux is an OS for developers
  - Text environment ➔ good for slow connections
- Grading standard: your submissions will be tested on the provided Linux server.
  - 채점기준: Ubuntu linux 16.04, gcc 5.4.0 20160609
- Advantages of Linux programming environments
  - Managed by the instructor and the TA
  - Your work remains in the server
    - TA does not have to access your PC, but can see your files very easily to give help to the students
    - If any mistake or loss is occurred during submission, or LMS server is down, your files will remain safely in the server

Linux Environment (2)

- Disadvantages of Linux programming environments
  - Requires network connections
  - Mostly command-line interface: GUI available, but too slow with network connections (we do not recommend GUI at the Linux server)
  - Need to learn edit a source file, compile it, and execute the output
  - Very different from Windows and Other OS's ➔ hard for beginners to start with
- The above disadvantages will not matter once you get used to the environment

Linux Account Setting

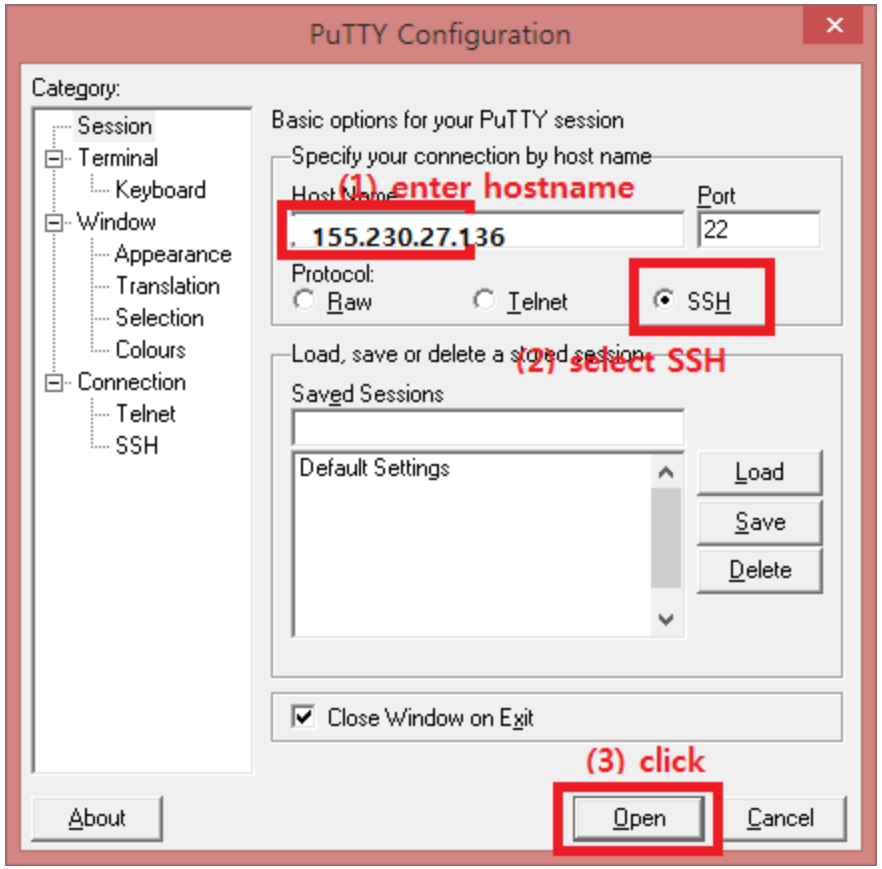
- Linux server address: 155.230.27.136
  - No named address such as www.knu.ac.kr, because once it is named, it will be known to outside through DNS servers, and easier to be attacked
- Account setting
  - ID: u${YOUR_ID}
    - For example for ID 202000319, the account name is “u20200019” (‘u’ is for graduate students)
    - The initial password is your email registered at LMS. Recommend changing it to prevent any security breach.
- The server can be accessed via SSH (secured shell) protocol to change the password, write C codes directly on the server. The term “secured” means that all the transfers are encrypted, and it is open to networks outside of KNU network (surely, inside connection is also open).

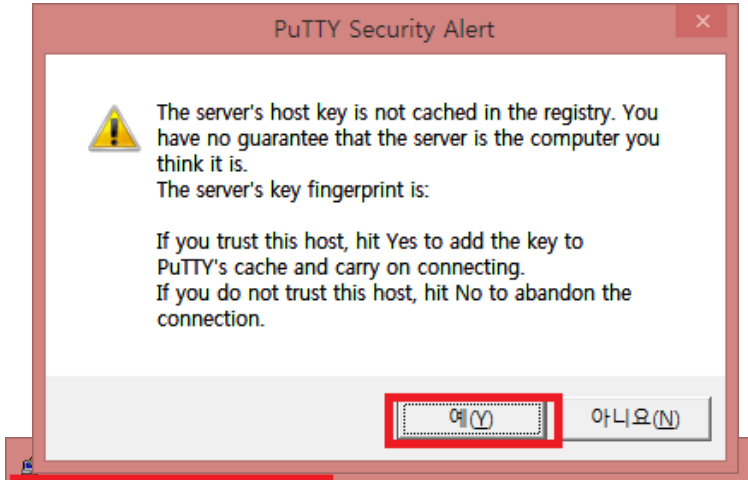
SSH Connections for Linux and MacOS

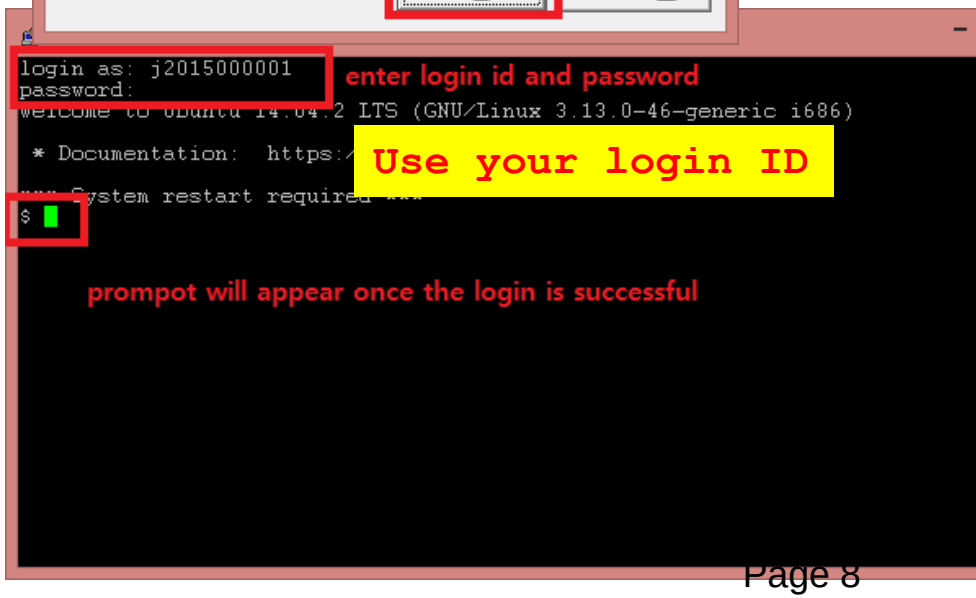
- Linux users
  - Simple run ‘ssh ${ID}@155.230.27.136’ on your terminal
- MacOS
  - The instructor does not know MacOS, so find it yourself
  - Linux terminal may be available on it

SSH Connection: Putty for Windows

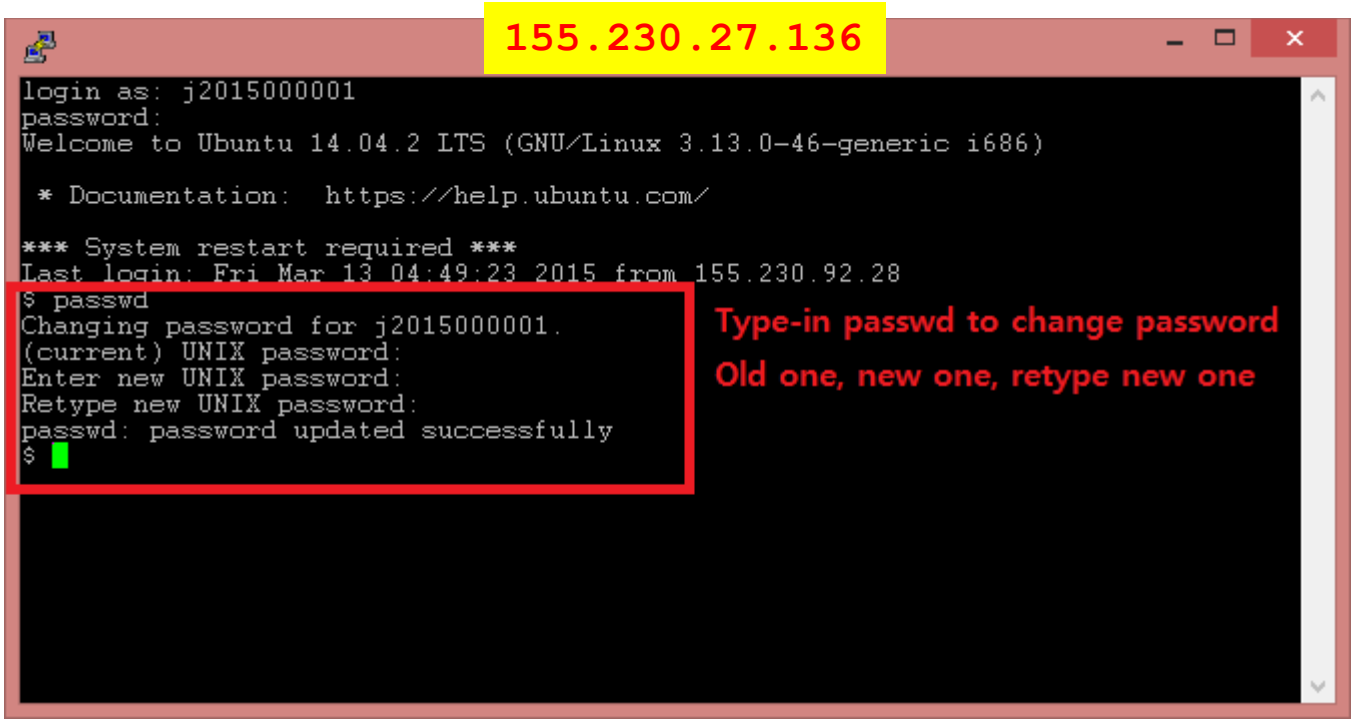
- [Putty] for Windows
  - Putty is a very light, free, SSH client for Windows.



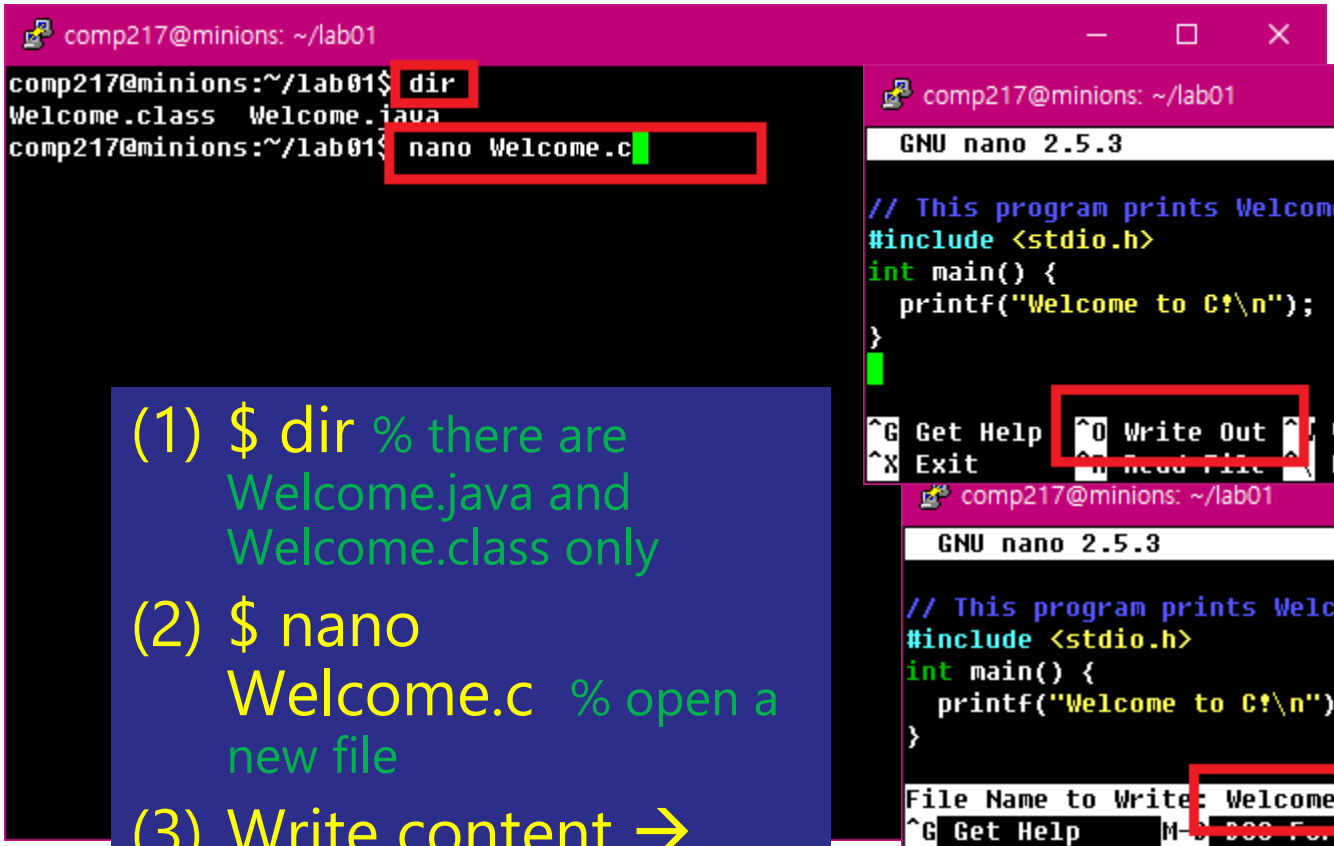




SSH Connection: Putty for Windows



Creating and Editing Welcome.c

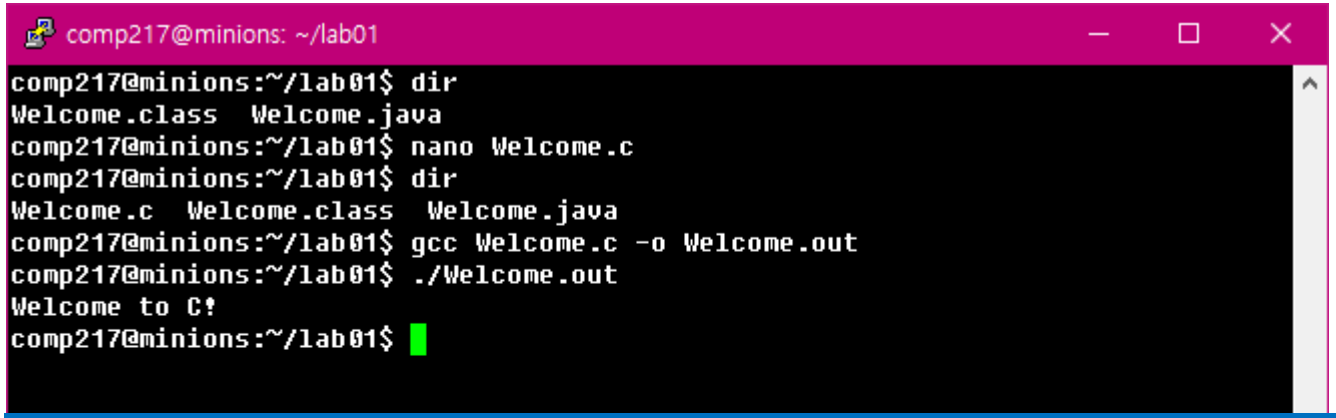


(1) $ dir % there are Welcome.java and Welcome.class only

(2) $ nano Welcome.c % open a new file

(3) Write content → Ctrl+O (^O) → confirm file name → Ctrl+X (^X) → exit

Compiling and Running C



(1) $ dir % lists the files in the current folder
A new file, "Welcome.c", is created

(2) $ gcc Welcome.c -o Welcome.out % compile
Use GNU C compiler (gcc)
Option "-o" is specifying the output. Without this option, default output "a.out" is created.

(3) $ dir % lists the files again
A new file, "Welcome.out", is created

(4) $ ./Welcome.out % execution
The prefix "./" lets Linux the executable file is in the current folder (mandatory).

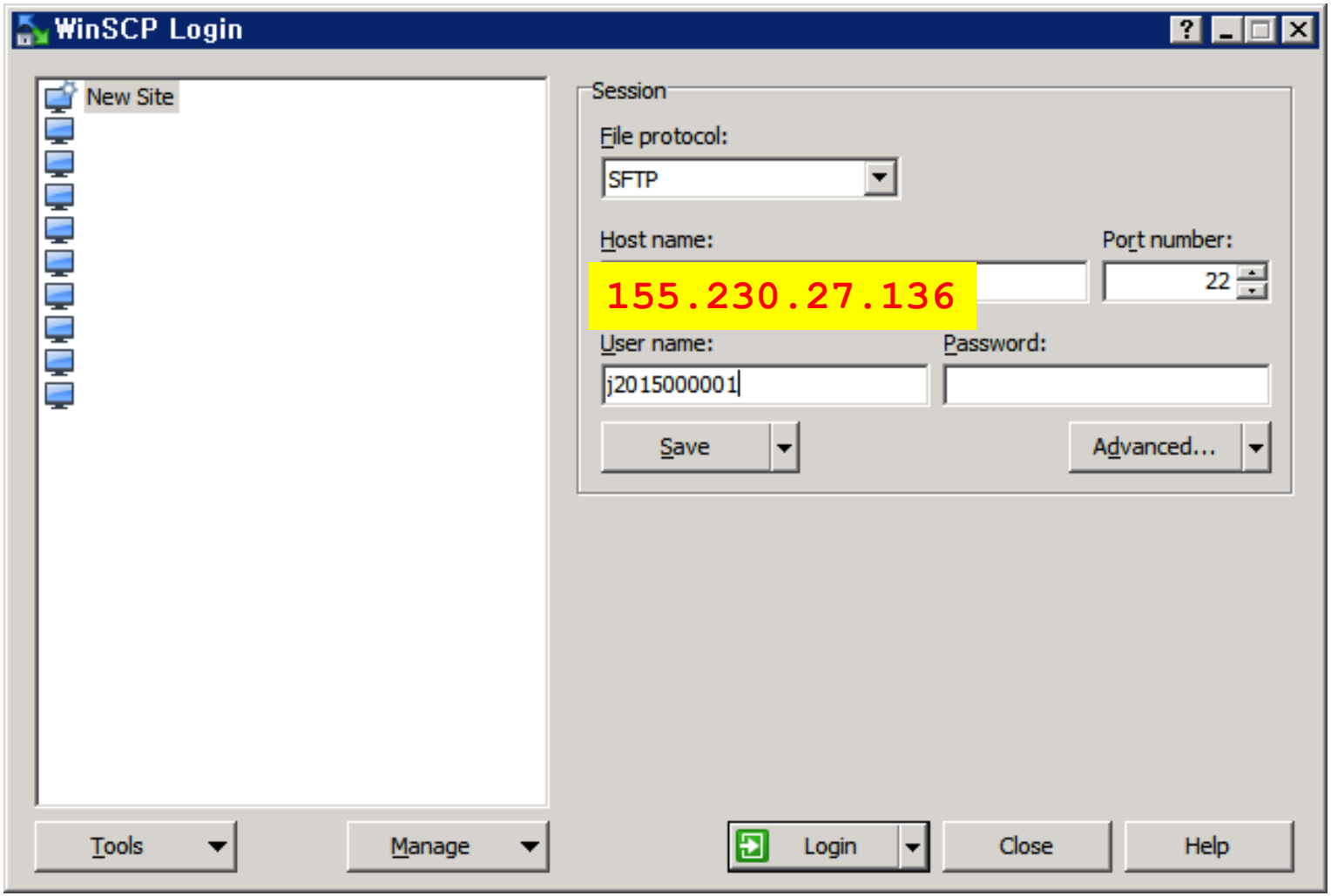
Why nano editor?

- Very simple screen editor that can be run on text terminals
- All the hotkey commands are displayed on the bottom, so novice users can easily use it without any difficulty
- This is just a suggestion. Any text editors including vi is fine as long as they can create plain source code files
- Use no special/Hangul characters. They may cause encoding failures in different OSs. Use characters from the basic ASCII tables only.

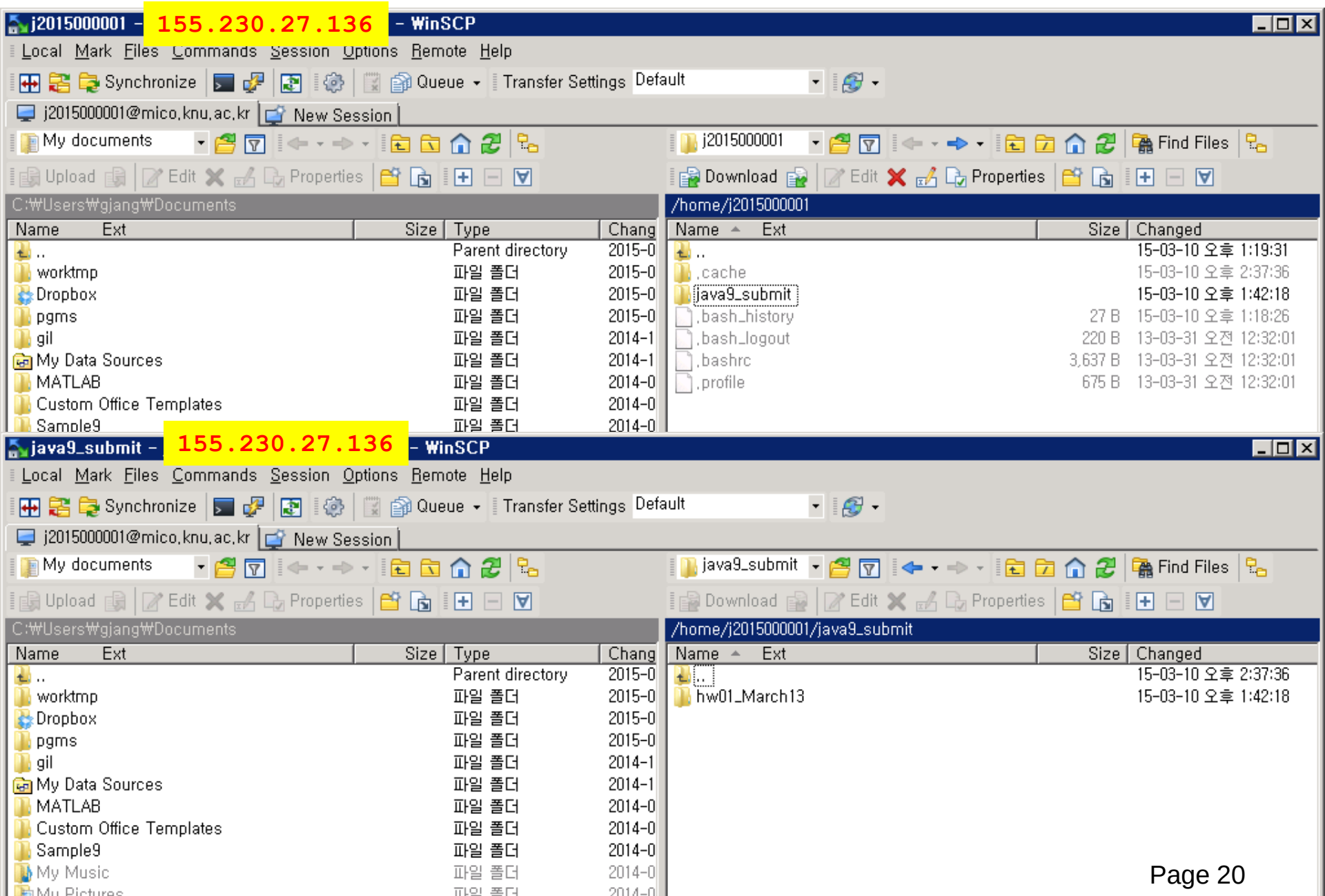
File Transfer using SFTP

- If use a linux server, your files are stored on the server, so you have to download the files to your PC to submit to LMS. You will also need to upload the files from your PC as well
- Need SFTP (secured file transfer protocol) client to do these
- Windows: winscp (winscp.net)
  - In the next 3 slides
- Linux: use command “sftp” in the shell
- MacOS: try to figure it out yourself

WinSCP login



WinSCP interface



End of Programming Environments

Proceed with your homework assignments