UNIX講習

UNIXシステムとコマンドの紹介

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An instruction on X window (ubuntsu machine)

- We use machines operated by a Linux system .
- Each user is identified by “user id” & “password”.
- Your terminal might start by pushing the monitor button ⏻ .

User id is ‘cmd’.

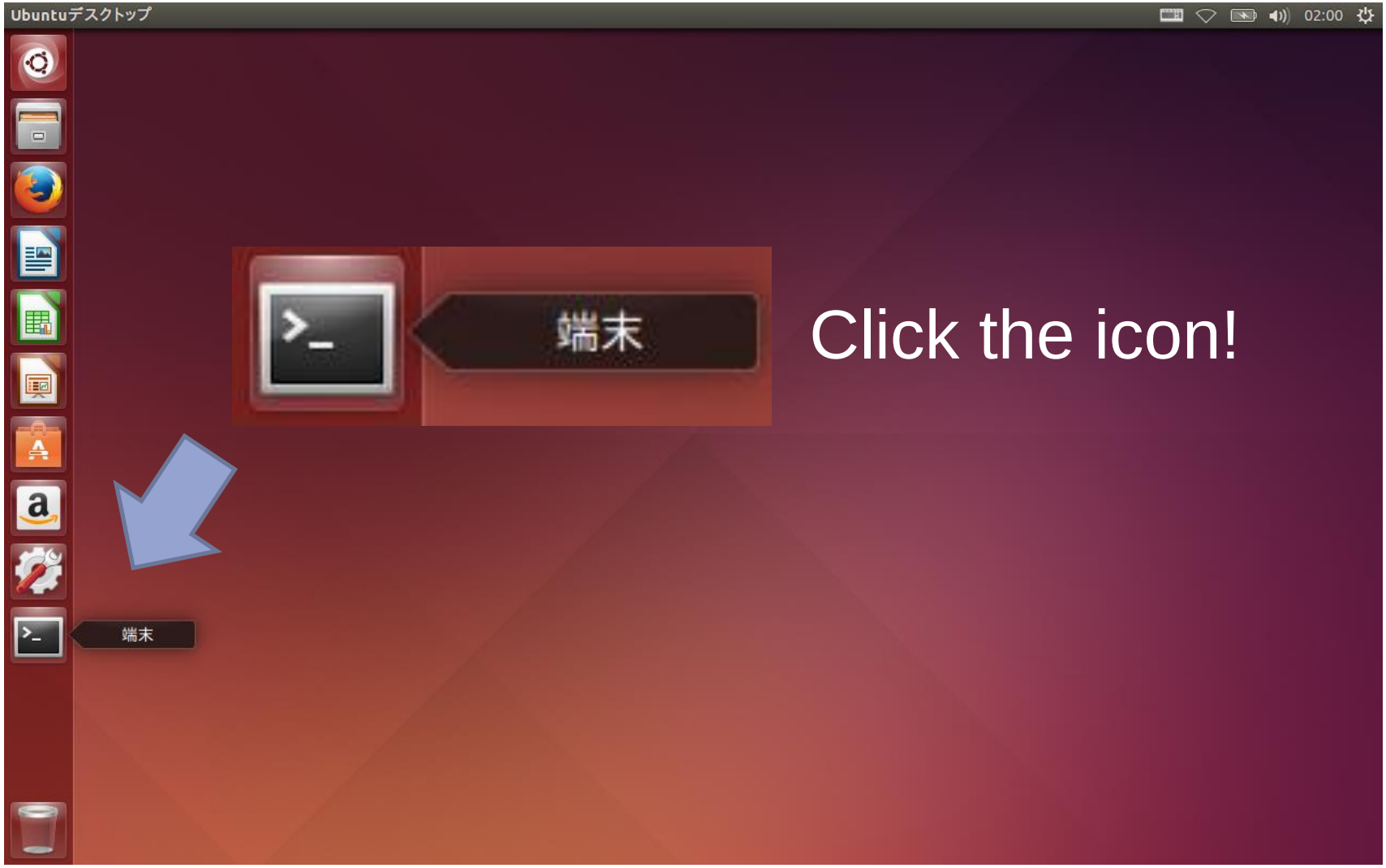
You need password ‘c.m.dworkshop’ to login the terminal machine.

For some terminal, you need password ‘cmdworkshop’ to work.

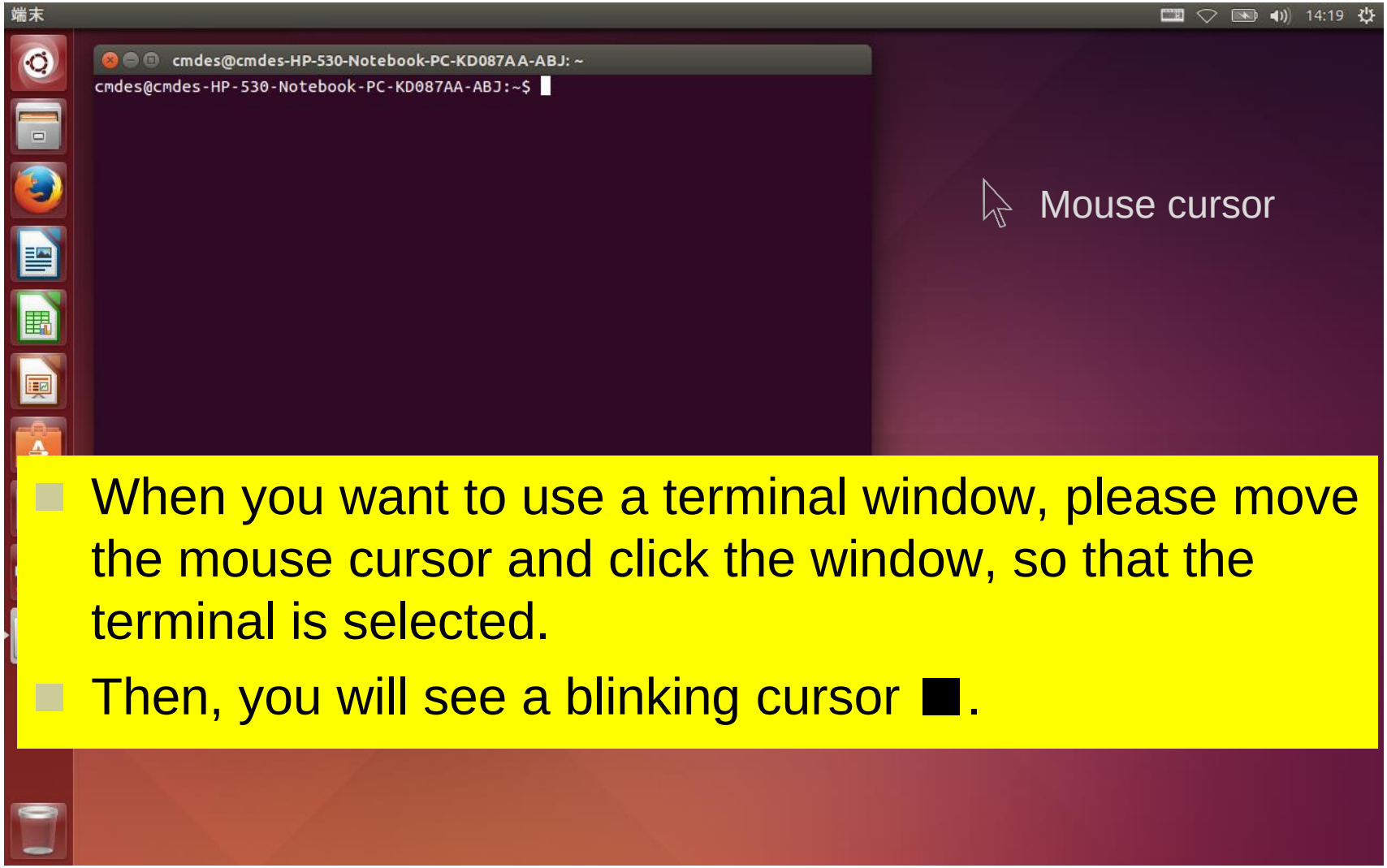
You have a good ‘日本語’ environment

ubuntu : the spirit of Ubuntu to the world of computers

You see “terminal”. Click it.

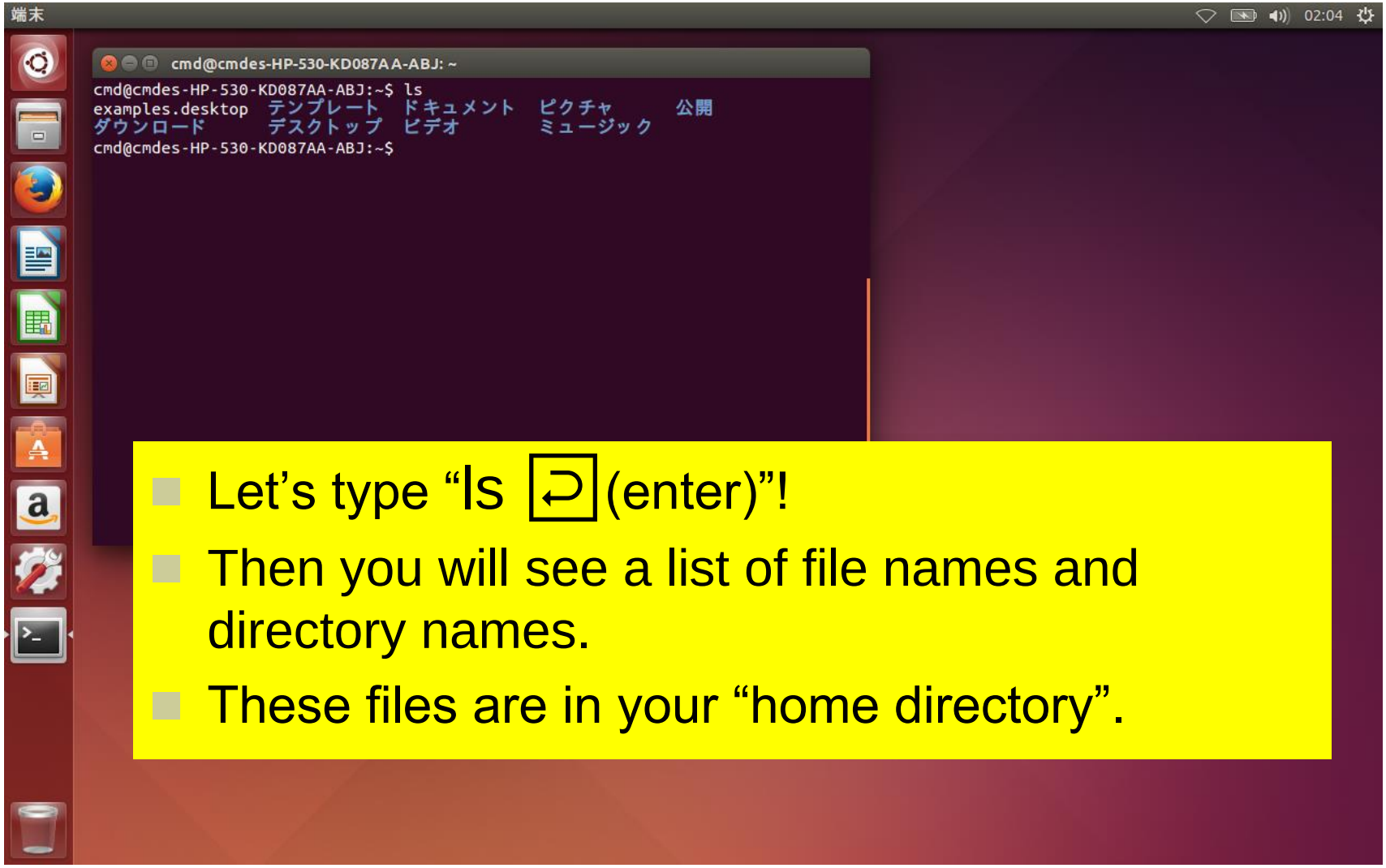


Selection of the terminal



- When you want to use a terminal window, please move the mouse cursor and click the window, so that the terminal is selected.
- Then, you will see a blinking cursor ■.

Type “ls” to see your home directory.

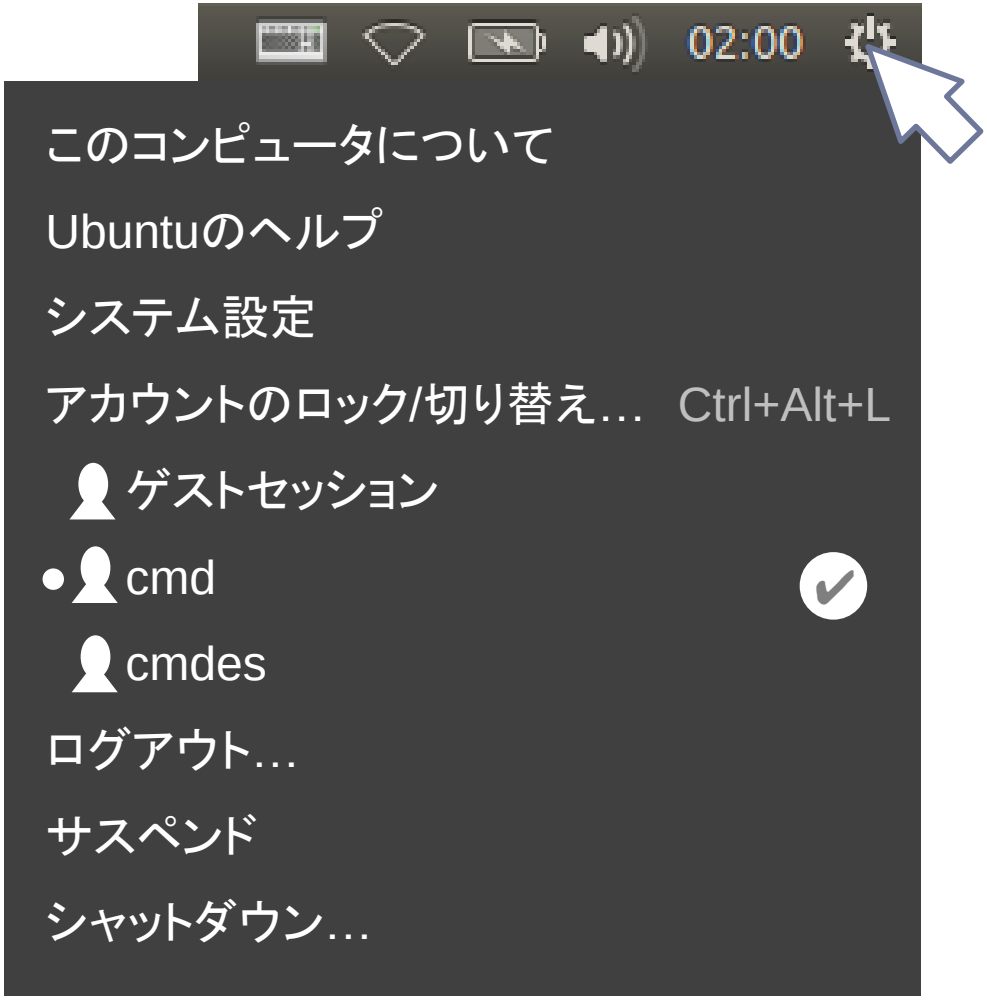


- Let’s type “ls ↵ (enter)”!
- Then you will see a list of file names and directory names.
- These files are in your “home directory”.

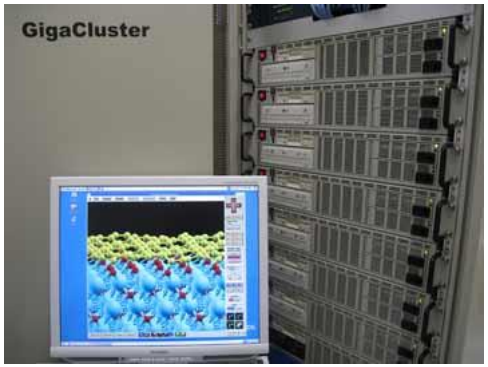
To start “Log out” or “Shutdown”

- Type an icon in the list. You will see a pull down menu.

- Depending on the system (OS), you would have a little different interface.
- You will see that it is not so difficult to find a manner, once you get “your style”.

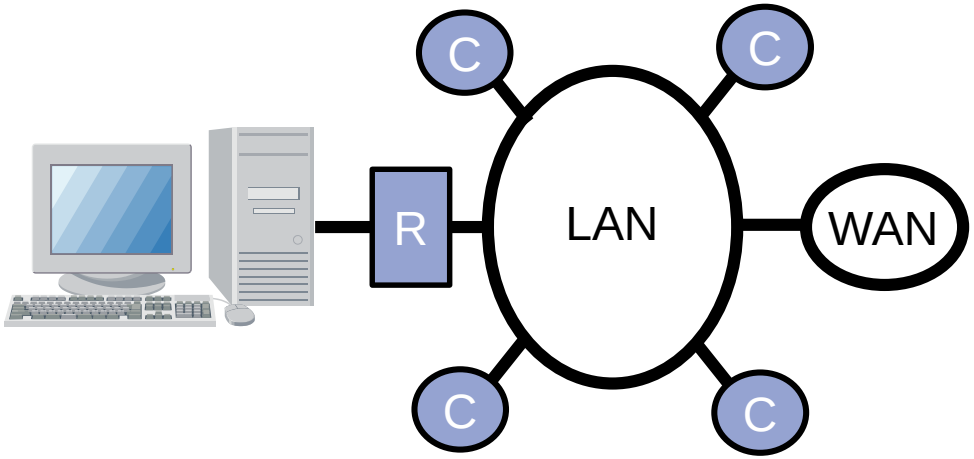


Login : you start connection to the system!



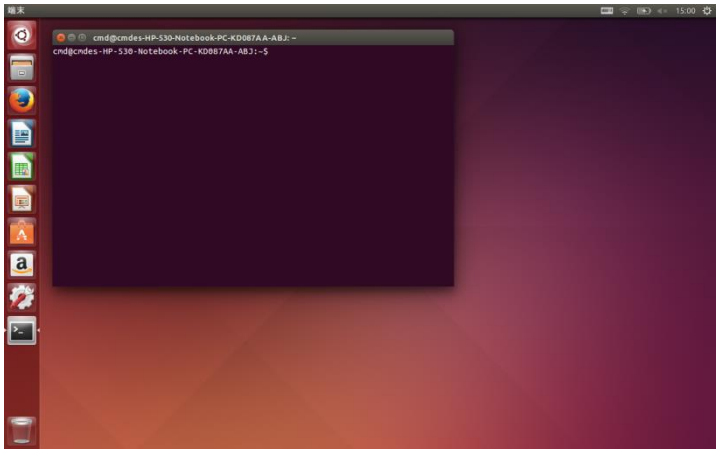
Bob → Unix on a PC

A user in a Unix system → Another Unix system



A user → Internet

Always you would see,

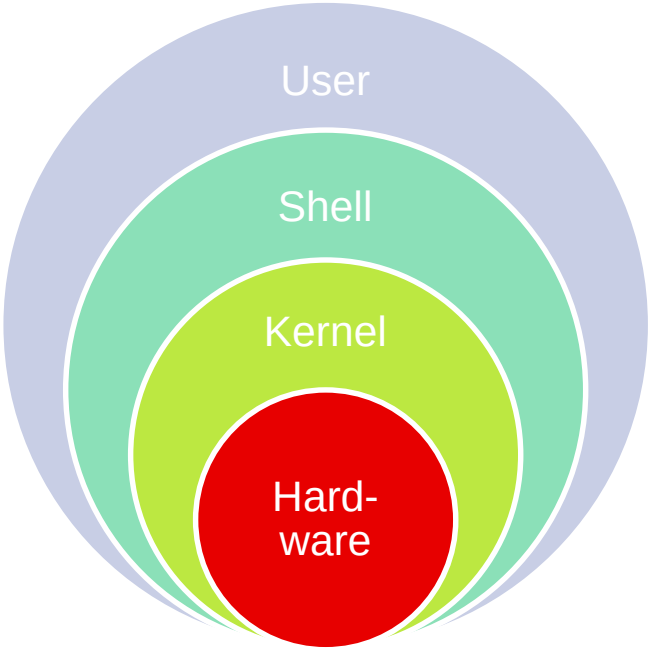


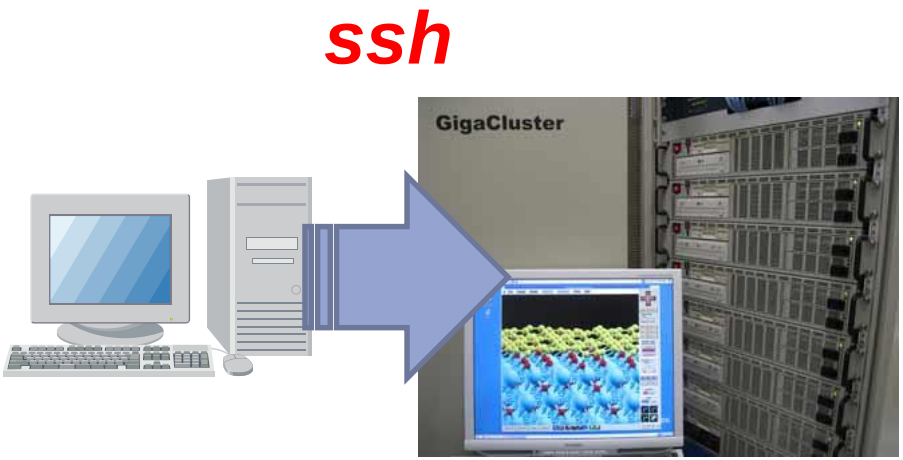
SSH : Secure Shell

A cryptographical network protocol

This is “a protocol for secure data communication” between two networked computers. It allows us

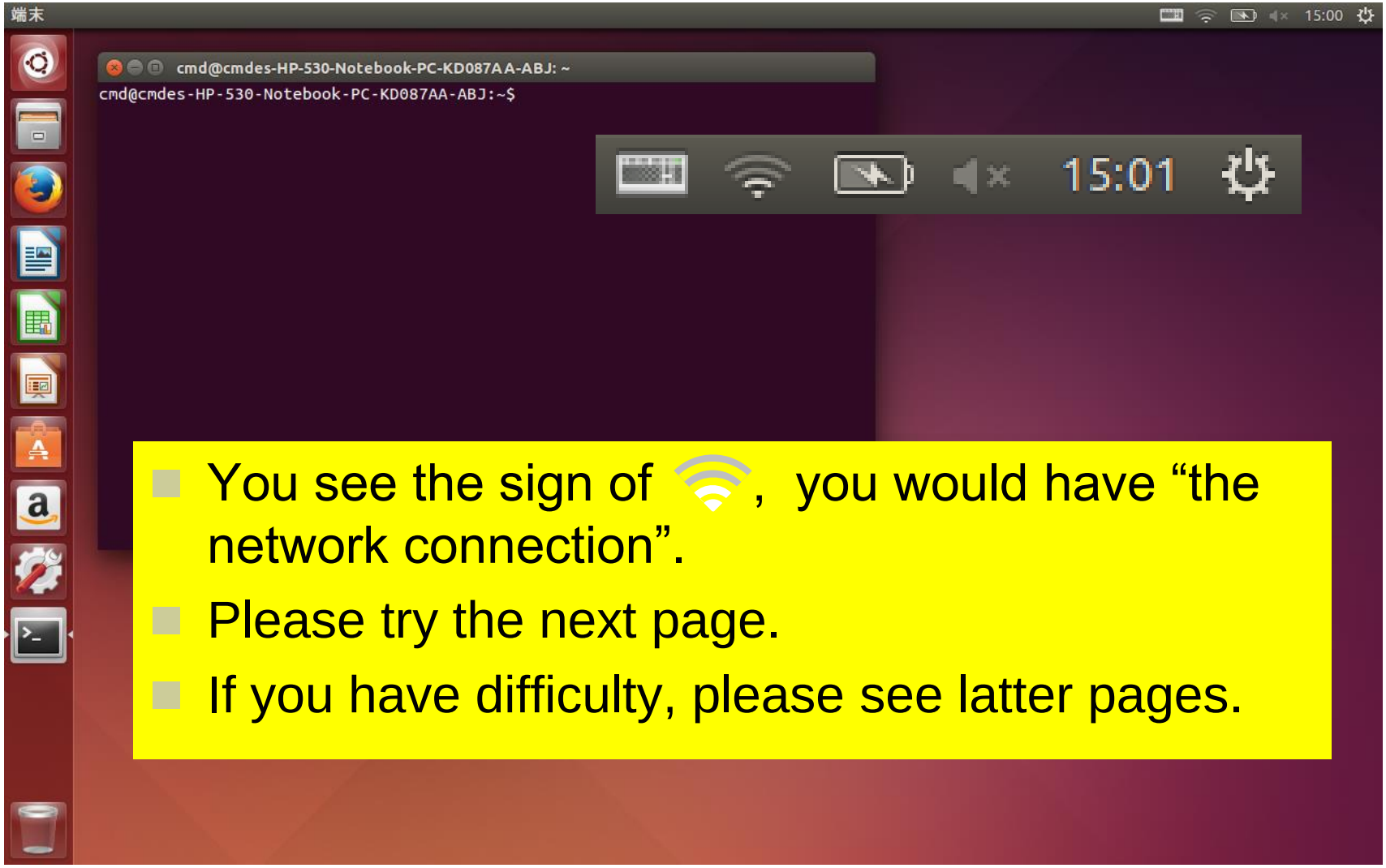
- To connect another computer from a computer system,
- To “login” in a secure manner,
- To execute “remote commands”.





Using “ssh” in the next page,
you can control a remote host
as if you are using it in front of you
in a secure way!

When your machine is connected to the net,



- You see the sign of , you would have “the network connection”.
- Please try the next page.
- If you have difficulty, please see latter pages.

Let's login "cmd" !

- Find your "user id": stud** (ex. stud07)
- On a terminal, use "ssh" to log in rl in OU.

  - $ ssh –Y –l stud** rl.phys.sci.osaka-u.ac.jp ↵

  - $ ssh stud**@rl.phys.sci.osaka-u.ac.jp ↵

  - Your passphrase is "cmdstud**".

  ("**" is same as <u>the two digits</u> in your "stud**".)

  - The typed passphrase is not shown on the screen.
  - For the second time, no request for passphrase.

- "ssh" is a unix command:
  - $ ssh –Y –l "user id" "machine address"

Two methods for ‘authentication’

RSA public key auth.

- Double key authentication
- Security level : high

Change id (stud**) !

Appearance

[teac01@rl ~]$ ssh –Y –l teac01 cmd2

Enter passphrase for key

‘/home/CMD/teac01/.ssh/id_rsa’:

The password will not echo back (not seen).

Appearance

[teac01@cmd2 ~]$ ssh –Y –l teac01 rl

Enter passphrase for key

‘/home/CMD/teac01/.ssh/id_rsa’:

The passphrase will not echo back (not seen).

Note: the directory shown is “on the local machine to connect the remote machine”.

RSA & DSA, in a nutshell

RSA was invented by Ron **R**ivest, Adi **S**hamir, and Leonard **A**dleman in 1977.
Nowadays, a key length of 4096 bits is used with
$ ssh-keygen –t RSA –b 4096

DSA (Digital Signature Algorithm) provided by NIST in 1991.
$ ssh-keygen –t DSA

An example of the usage of ‘ssh-keygen’ :

$ ssh-keygen

Enter file in which to save the key (/home/CMD/teac01/.ssh/id_rsa) :

Enter passphrase (empty for no passphrase) :

Enter same passphrase again :

The public key in id_rsa.pub on the client-host should be saved (added) in

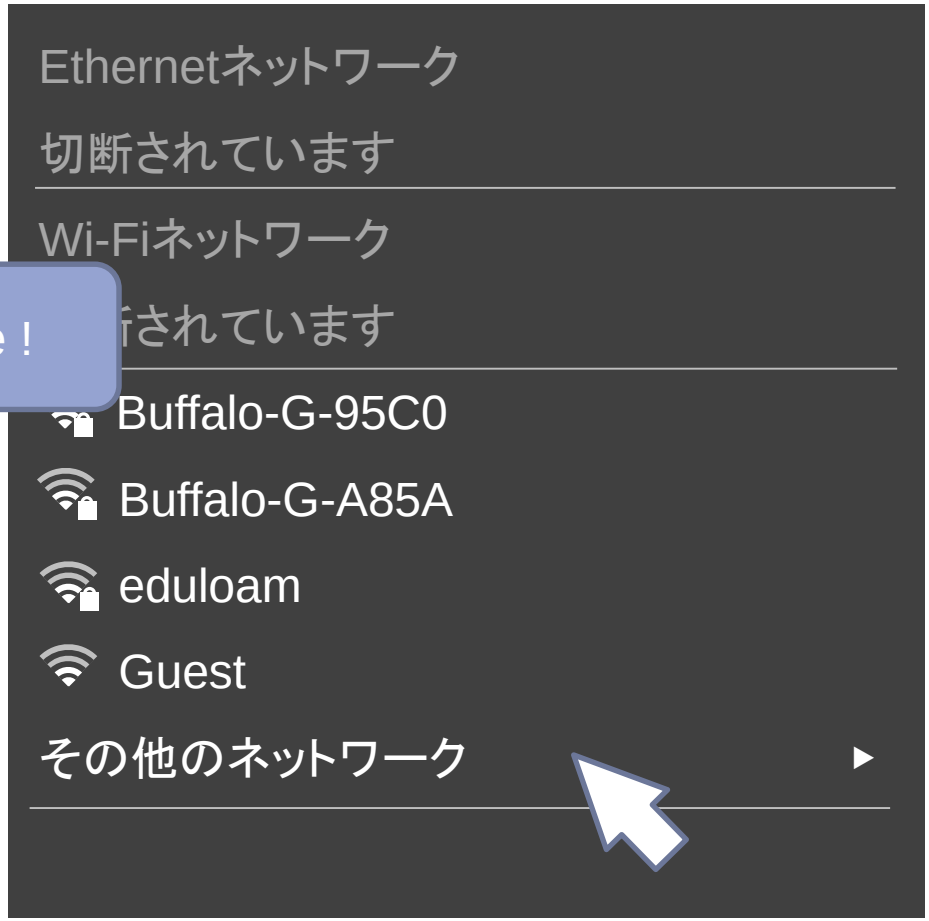
.ssh/authorized_keys

in the server-host.

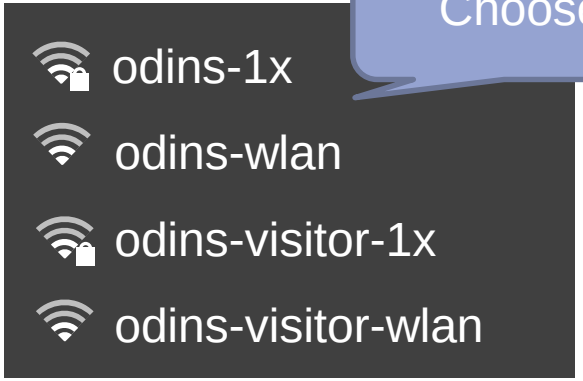
You might have lost connection.

```
cmd@cmdes-HP-530-Notebook-PC-KD087AA-ABJ: ~
cmd@cmdes-HP-530-Notebook-PC-KD087AA-ABJ:~$ ssh teac01 cmd2.phys.sci.osaka-u.ac.
jp
ssh: Could not resolve hostname teac01: Name or service not known
cmd@cmdes-HP-530-Notebook-PC-KD087AA-ABJ:~$
```

You need to change this sign, and have the connection.



Choose !

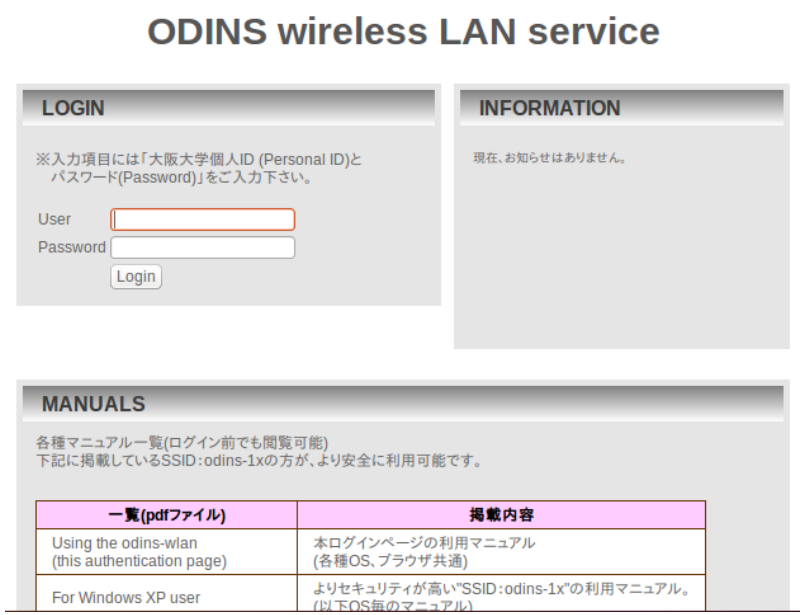


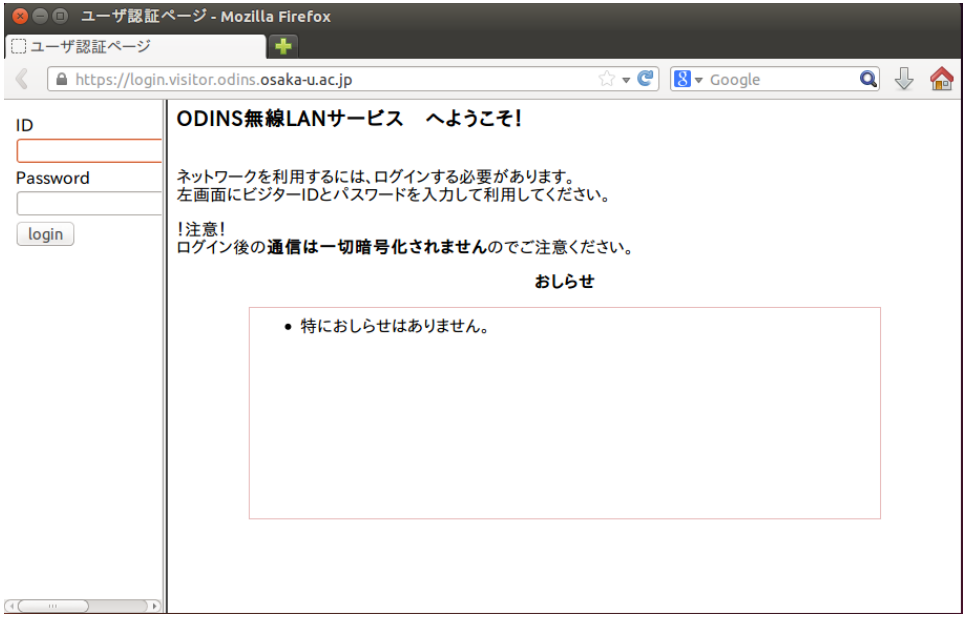
For odins-wlan or odins-visitor-wlan

You need to open “Firefox” by pushing . Then you might be asked to input your ID and Password for “ODINS”.

For user having “大阪大学個人ID”, choose “odins-wlan”.

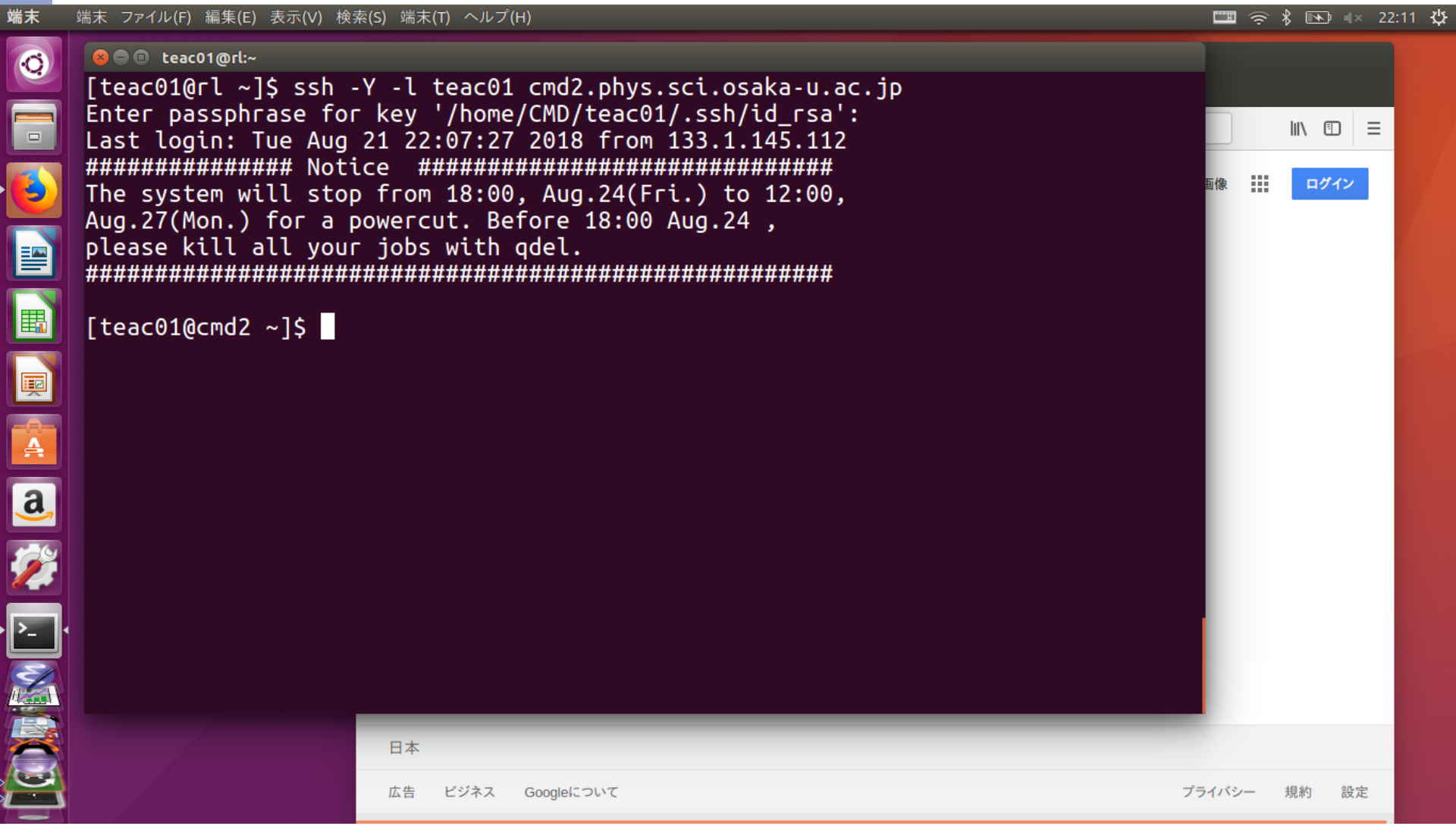
For user having “ビジターID”, choose “odins-visitor-wlan”.





The above images for the login windows might be renewed.

When the connection is successful,



Command minimum

- Typing a UNIX Command
- Login
- cp : copy a file
- Unpack : tar
- Edit a file : emacs
- make : create an application
- Run
- Logout

Key typing for explanation

This is a character automatically shown by the computer, which is called “a prompt”. The character (or a set of words) depends on the setting of the machine.

Finally, you need to type the return key.

$ less test.txt

There is a space.

Type the space key (The long key).

In this case, you may type letters starting from ‘l’.

Caution: type “q”, when you want to stop, end, or quit less.

At first, please type

```
$ cp  /home/CMD/teac01/ex.tar .↵
```

Space !

Space !

Next, please type

```
$ tar  xvf  ex.tar
$ cd  ex
```

To execute a command, type

```
$ less  test.txt
```

Caution: type “q”, when you want to stop, end, or quit less.

This action may be explained as,

Purpose : to see test.txt.

目的：test.txtの中を見る.

```
$ less  test.txt
```

A short manual of “less”

- Move
  - “f” : move forward.
  - “b” : move backward.
- Search
  - “/ [pattern]” : search the pattern.
  - “n” : search again
- Others
  - “q” : quit. (same as :q, :Q, or ZZ.)
  - “r” : refresh the screen.
  - “h” : help.

To compile a program,

```
$ make
```

To run the program,

```
$ ./diag
```

Further, you can use,

```
$ emacs  diag.f90  –nw
$ cd  ..
$ ls  –laF
```

Please see the following pages and “計算機(UNIX)使用法”.

The terminal does hung-up. You can do it.

- No character appears for your keystroke, then
  - Type Ctrl + q . Or Ctrl + s may restart the input, when the scroll is stopped.
- No prompt (flushing cursor at /home/x60***>) appears. Then, you can try one of these.
  - Ctrl + d (When you call cat without arguments.)
  - Ctrl + c (When a command does not stop.)
  - Ctrl + z Then, you can search an unfinished command using ‘ps’ command and stop it by ‘kill’. (This action may be required when Ctrl + c does not work.)
- If something wrong with the cursor, then
  - Ctrl + j .

How to start your job?

- Many programs are packaged and stored in a compressed file. You will perform un-compression.

Flow of usage	Command in use
Un-compress	tar (tape archive), uudecode
Compile	make, ifort (follow your instructor.)
Write inputs	emacs, vi
Run the program	Command made by compilation, qsub

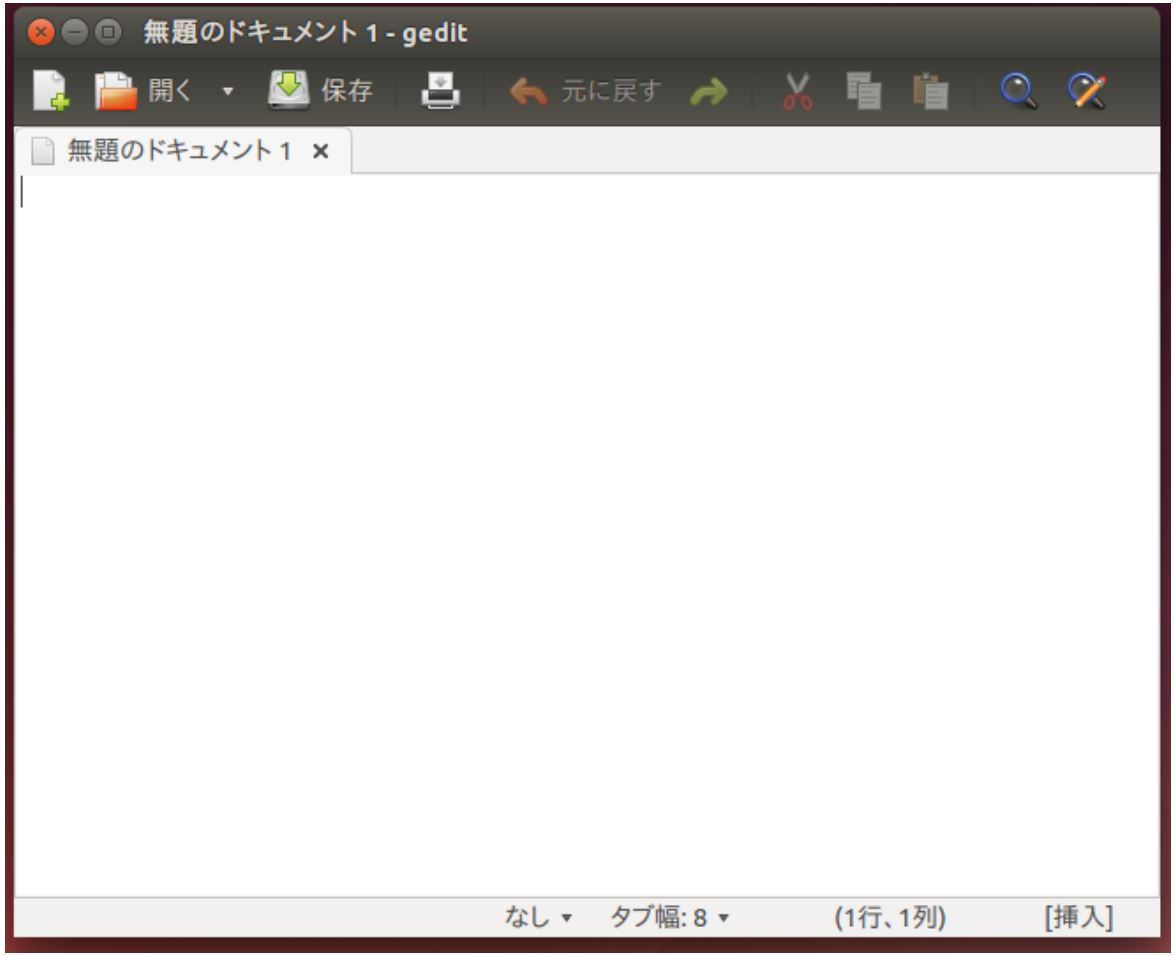
- Un-compression of a tar-archived file would be,

```
[stud01@cmd ~]$ tar xvf CMD-test.tar
[stud01@cmd ~]$ tar zxvf CMD-test.tgz
```

For zip file

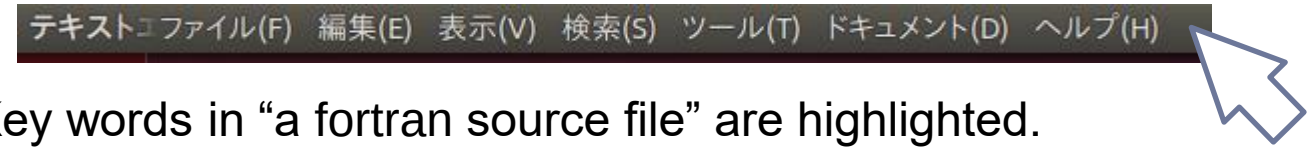
Edit a file by “gedit” !

- If this is the first time, we recommend you to edit a file by “gedit”.

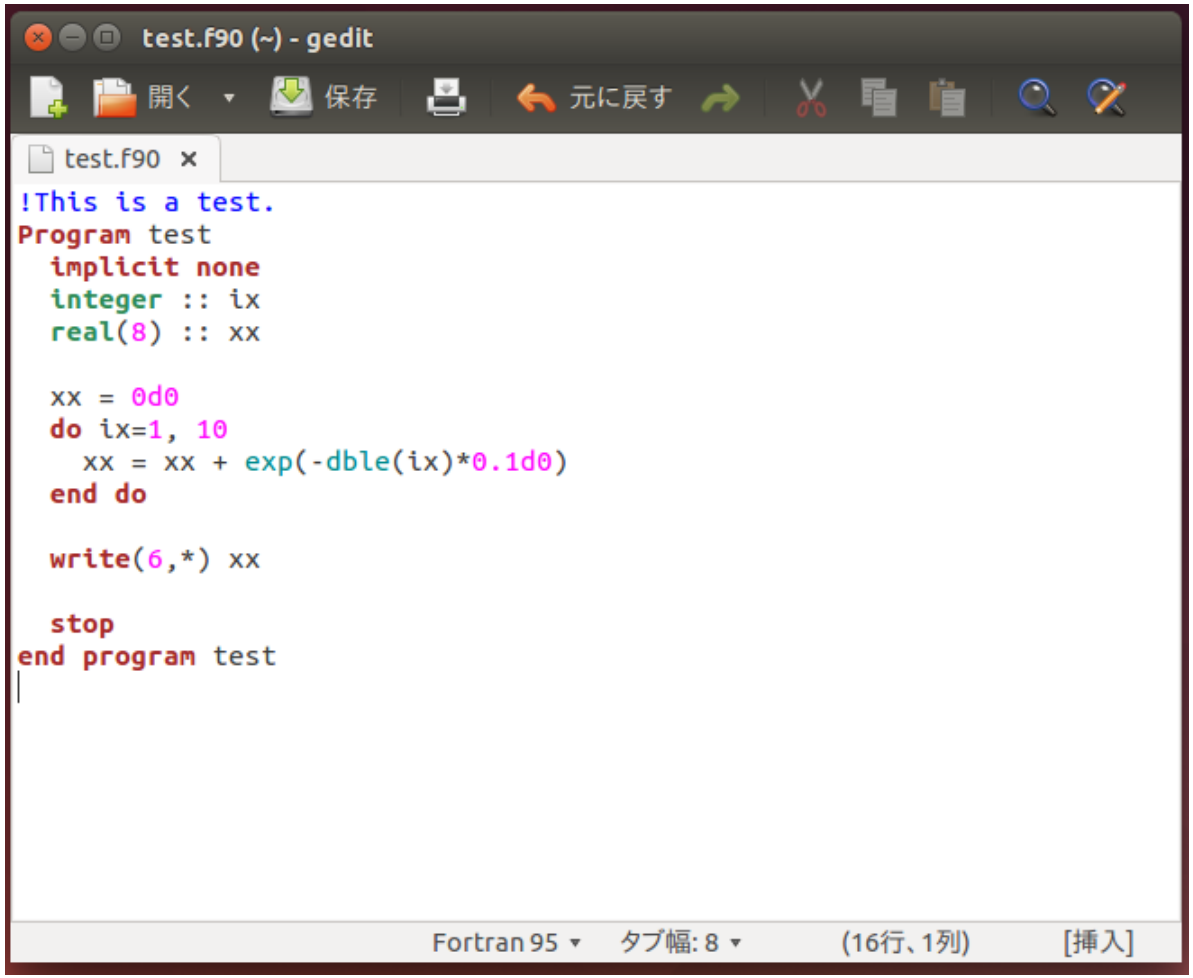


How to use gedit

Put your curser on the head line, then you will find the menu bar.



Key words in “a fortran source file” are highlighted.



How to use Emacs (basics)

- Let's start Emacs up with new Window.

  `[stud01@cmd ~]$ emacs &`

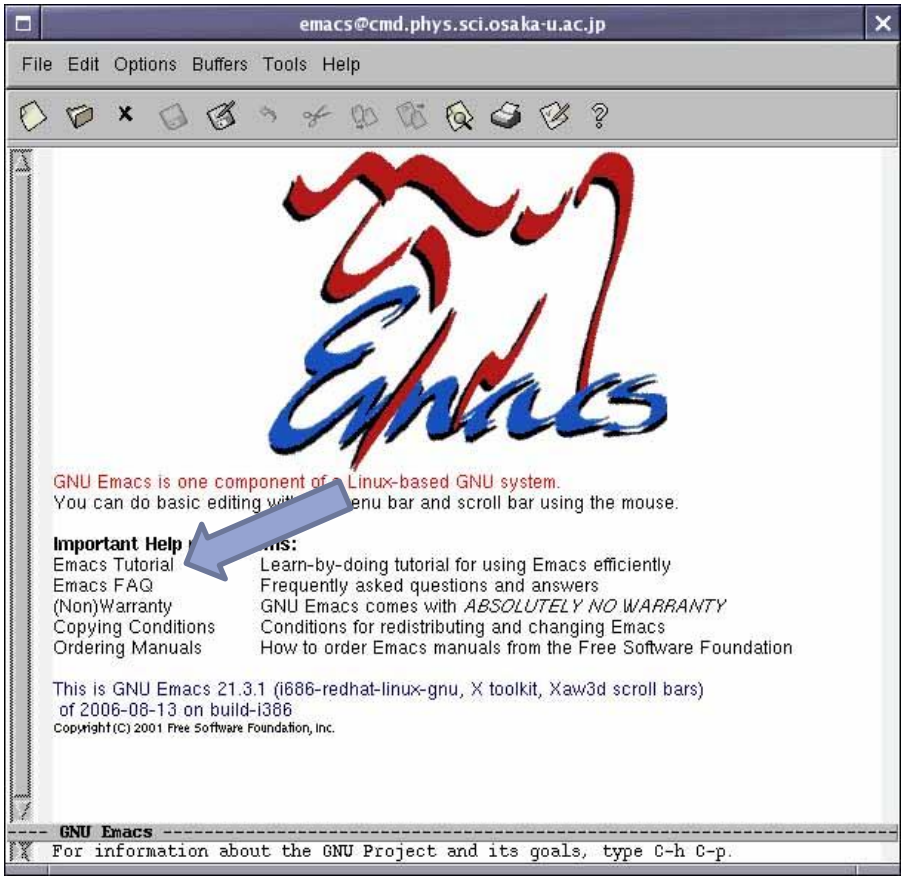
  `Don't you find?`

- In the first page, message to introduce Emacs is given.
- You can start editing a file by typing Ctrl + x Ctrl + f. Please insert a file name at

  `Find file : ~/`

  / represents the home directory.

  which is shown in a lower sub-window.



- You may edit test.txt by

  `[stud01@cmd CMD-test]$ emacs test.txt &`

  which allows you to start Emacs up with the file shown.

  Name of the target file.

Emacs keystroke I : Ctrl + “1 character”

Key	command action
C+@	set-mark-command
C+a	move-beginning-of-line
C+b	backward-char
C+c	mode-specific-command-prefix
C+d	delete-char
C+e	move-end-of-line
C+f	forward-char
C+g	keyboard-quit
C+h	help-command
C+i	indent-for-tab-command
C+j	newline-and-indent
C+k	kill-line
C+l	recenter-top-bottom
C+m	newline-and-indent
C+n	next-line

Key	command action
C+o	open-line
C+p	previous-line
C+q	quated-insert
C+r	insearch-backward
C+s	isearch-forward
C+t	transpose-chars
C+u	universal-argument
C+v	scroll-up
C+w	kill-region
C+x	Control-X-prefix
C+y	yank
C+z	iconify-or-deiconify-frame
C+_	undo
C+SPC	set-mark-command
C+/	undo

Emacs keystroke II : Esc + “1 character”

Key	command action
Esc+a	backward-sentence
Esc+b	backward-ward
Esc+c	capitalize-word
Esc+d	kill-word
Esc+e	forward-sentence
Esc+f	forward-word
Esc+g	prefix command
Esc+h	mark-paragraph
Esc+i	tab-to-tab-stop
Esc+j	indent-new-comment-line
Esc+k	kill-sentence
Esc+l	downcase-word

Key	command action
Esc+m	back-to-indentation
Esc+o	face-meny-keymap
Esc+q	fill-paragraph
Esc+r	move-to-window-line
Esc+t	transpose-words
Esc+u	upcase-word
Esc+v	scroll-down
Esc+w	kill-ring-save
Esc+x	execute-extended-command
Esc+y	yank-pop
Esc+z	zap-to-char

In addition, we have

Esc , > move to the end of buffer

Esc , < move to the top of buffer

Emacs keystroke III : Ctrl + “2 strokes”

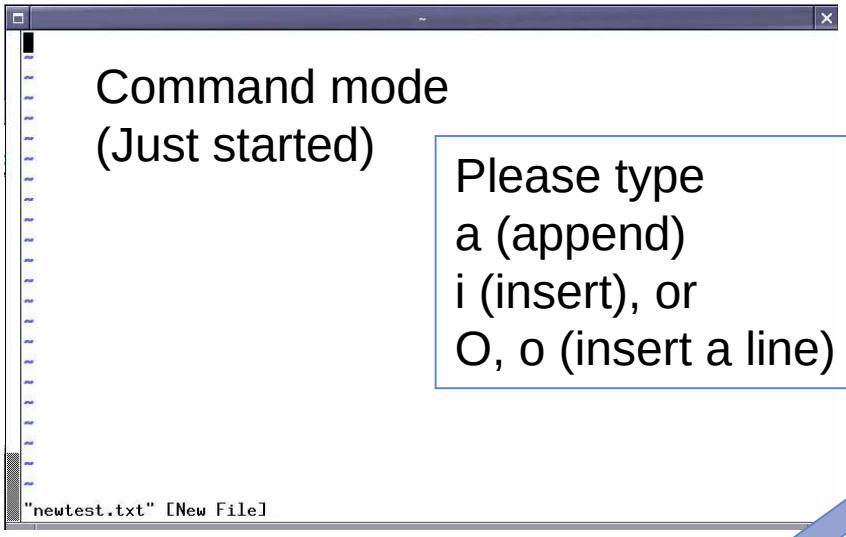
Key	command action
C+x C+b	list-buffers
C+x C+c	save-buffers-kill-emacs
C+x C+e	eval-last-sexp
C+x C+f	find-file
C+x TAB	indent-rigidly
C+x C+r	find-file-read-only
C+x C+s	save-buffer
C+x C+w	write-file
C+x 0	delete-window
C+x 1	delete-other-windows
C+x 2	split-window-vertically
C+x 3	split-window-holizontally

Key	command action
C+x b	switch-to-buffer
C+x d	dired
C+x i	insert-file
C+x k	kill-buffer
C+x o	other-window
C+x u	advertised-undo
C+x z	repeat

- You can do copy or cut&paste using your mouse.
- Command may be called in the GUI menu line.
- To make completion, please type [Tab], in a middle of writing a word.
- [>] may be [Shift] + [.] .

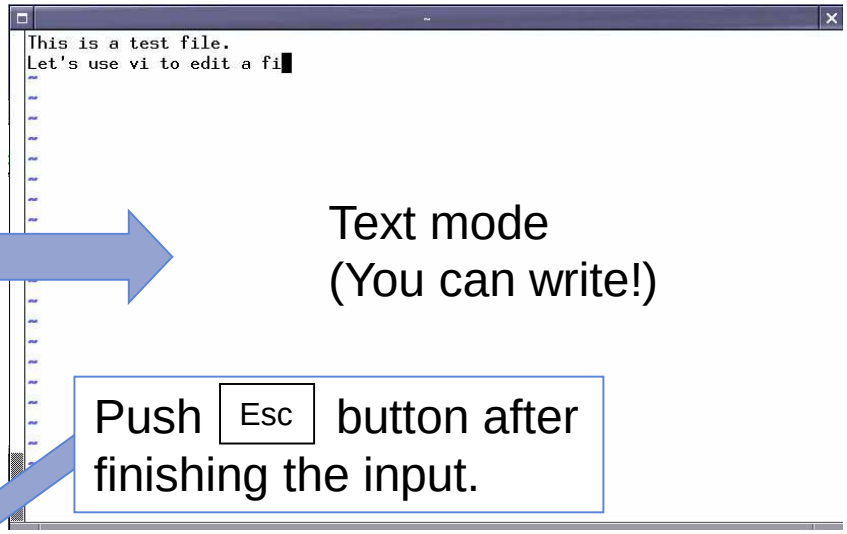
Modes of vi & some commands

Let's do start vi up by `[stud01@cmd ~]$ vi newtest.txt`



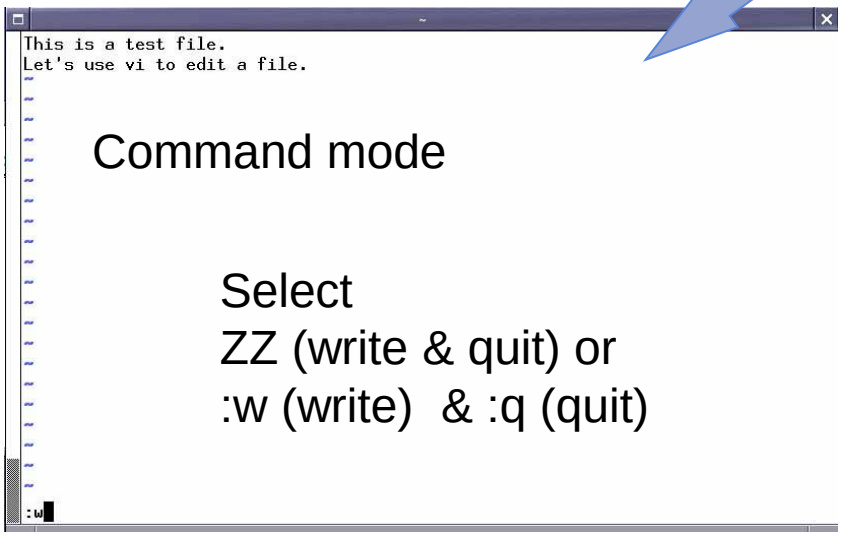
Command mode
(Just started)

Please type
a (append)
i (insert), or
O, o (insert a line)



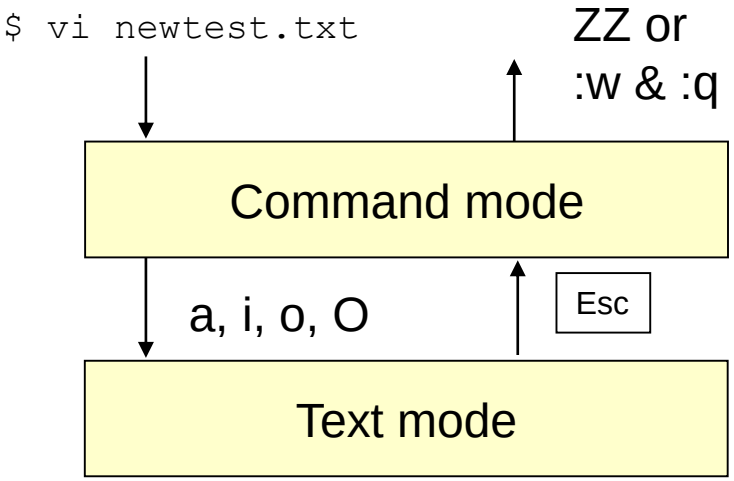
Text mode
(You can write!)

Push Esc button after finishing the input.



Command mode

Select
ZZ (write & quit) or
:w (write) & :q (quit)



If you have a trouble in vi

- Undo a command just done：

  In the command mode (If you are in text mode, type Esc and then) push ‘u’ (undo).

- Re-flesh the screen ：

  Push Ctrl + l in the command mode.

- If you did some unwished operations：

  Type ‘1P’ in the command mode.

- If you cannot find a way by doing some solutions above, please consult instructors (teachers & tutors).

Example of “less .bashrc”

- Let’s look at contents of a file. Check file lists by “ls –laF.”

```
-rw-r--r--   1 stud01 cmd   124 Feb  15 19.34  .bashrc
 ...
```

- You can use “cat” to see the contents.

```
[stud01@cmd ~]$ cat .bashrc
```

- You can use “less” command to see the contents of a file.

```
[stud01@cmd ~]$ less .bashrc
```

- Type “q” to end the less command, after checking the contents.

```
# .bashrc

 # User specific aliases and functions

 # Source global definitions
 if [ -f /etc/bashrc ]; then
        . /etc/bashrc
 fi
.bashrc (END)
```

Please use “man” command to find why people use “less.”

```
[stud01@cmd ~]$ man less
[stud01@cmd ~]$ man more
```

Which would you like “more” or “less”?

Please enjoy your unix life!

Thanks a lot.
K. Kusakabe