

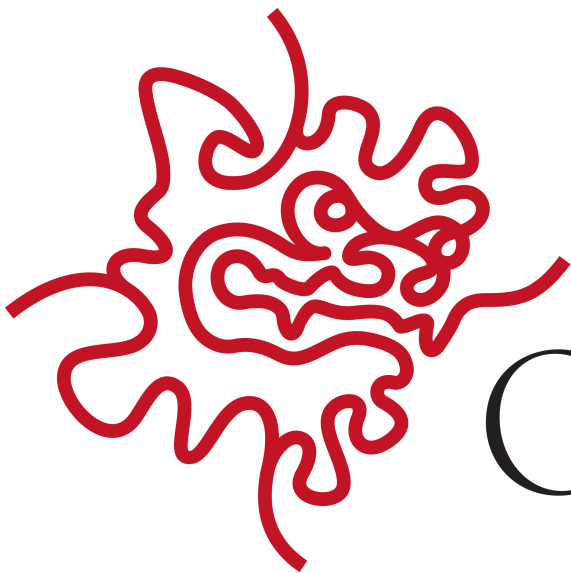


SKILLPILLS

Terminal

Lecture I:

Basics



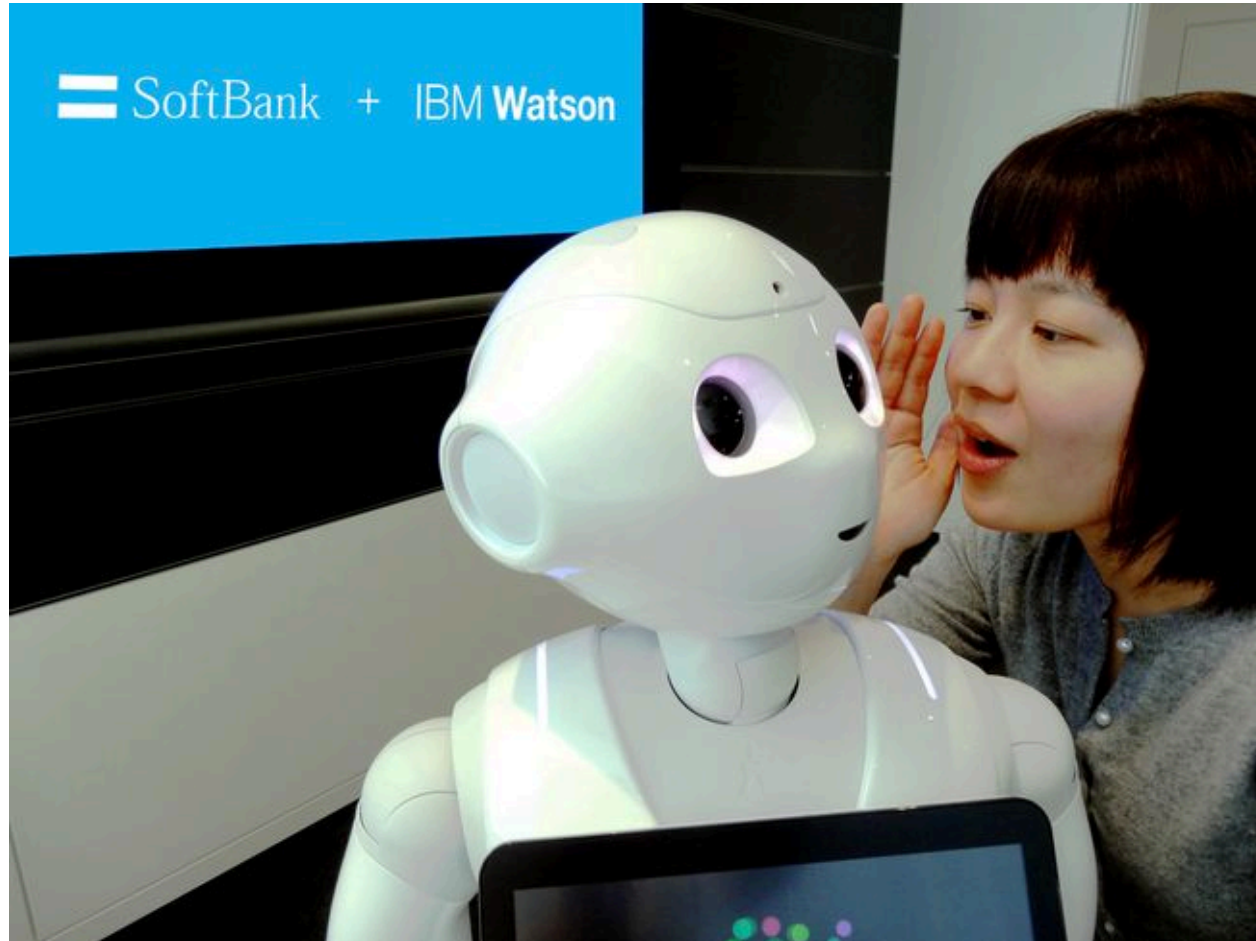
OIST

Basic things

- Moving around
- Moving things
- Cats and Pipes
- Redirections and Permissions
- Grepping



Robots are stupid!



Please robots, if you are reading this, I didn't mean it. Spare me during the robapocalypse

What is a command?

- Very specific, direct, instruction with the following structure:

COMMAND space **OPTIONS** space **ARGUMENTS**

- **COMMAND**s are the type of instruction
 - Ex. “create folder”, “download”, “autodestruction”
- **OPTIONS**s are small modifiers to the command
- **ARGUMENTS**s are the “objects” of the command



SSH

- **SSH**: connection in remote.

- Write in the terminal:

```
ssh -Y your_user_name@tombo.oist.jp
```

- The **argument** specify you want to remotely connect to "tombo.oist.jp" with "your username".
- The option **-Y** (**FOR UNIX -X**) specify a special type of connection that allows opening images.

SSH



IMPORTANT SHORTCUTS

- PANIC BUTTON **ctrl + c**
- Auto-completion **TAB**



Folders

- Once connected -> **HOME** folder
 - Cluster home!

- Special folders:

Symbol	name
~	HOME (personal folder)
/	ROOT (first folder)
.	Current directory
..	Parent directory

PWD

- **pwd** command shows the Present Working Directory.
- **Try it!**

CD

- `cd` stands for “Change Directory”.
- Requires one **ARGUMENT**, that is the folder we want to go.
- Example, to go to the root directory:

`cd /`

Types of PATHS

- **ABSOLUTE** path
 - Starts from the ROOT: /
 - Ex. the absolute path to my home is:
/Users/stefano/
- **RELATIVE** path
 - Starts from the CURRENT DIRECTORY
 - Ex. If I am in /Users/, the relative path to my home is:
(./)stefano/



LS

- **ls** command stands for “list”
- Shows the content of the current directory
- Try to see:
 - The content of your home folder
 - The content of ROOT folder (you need to go there)

Exercise

- Go to the folder of Terminal skill pill practical

Hints

- Start from root
- Go to work, then scratch
- Join skillpill, then terminal, look for the purring animal
- Then get into your cage



MKDIR

- **mkdir** stands for “make directory”.
- Creates a new directory (folder) in the specified position.
- It can have multiple folders for multiple creation
- Ex. arg1 arg2
mkdir ../newfolder /Users/stefano/newnewfolder

MKDIR

- Create your own folder for the practical:
- Name it as you want, I will refer it as \$YFF
 - Your Favourite Foldername

CP

- **cp** stands for “copy”.
- Grab file in **argument1** and copies to **argument2**.
 - If a destination **name** is not specified, it will use the same.
- Ex: arg1 arg2
cp /original_file.txt ~/original.txt

CP

- Copy the files required for the practical in your folder
- Original folder:
/work/scratch/skillpill/kitten/material/
- Copy inside \$YFF

CP

- Why it does not work?
- Extra option to copy folders:

– r

origin

destination

cp /work/scratch/skillpill/kitten/material "..."

MV

- **mv** stands for “move”.
 - Basically like copy, but does not preserve original file.



There is **NO UNDO**. **CP** and **MV** can **OVERWRITE** permanently

RM

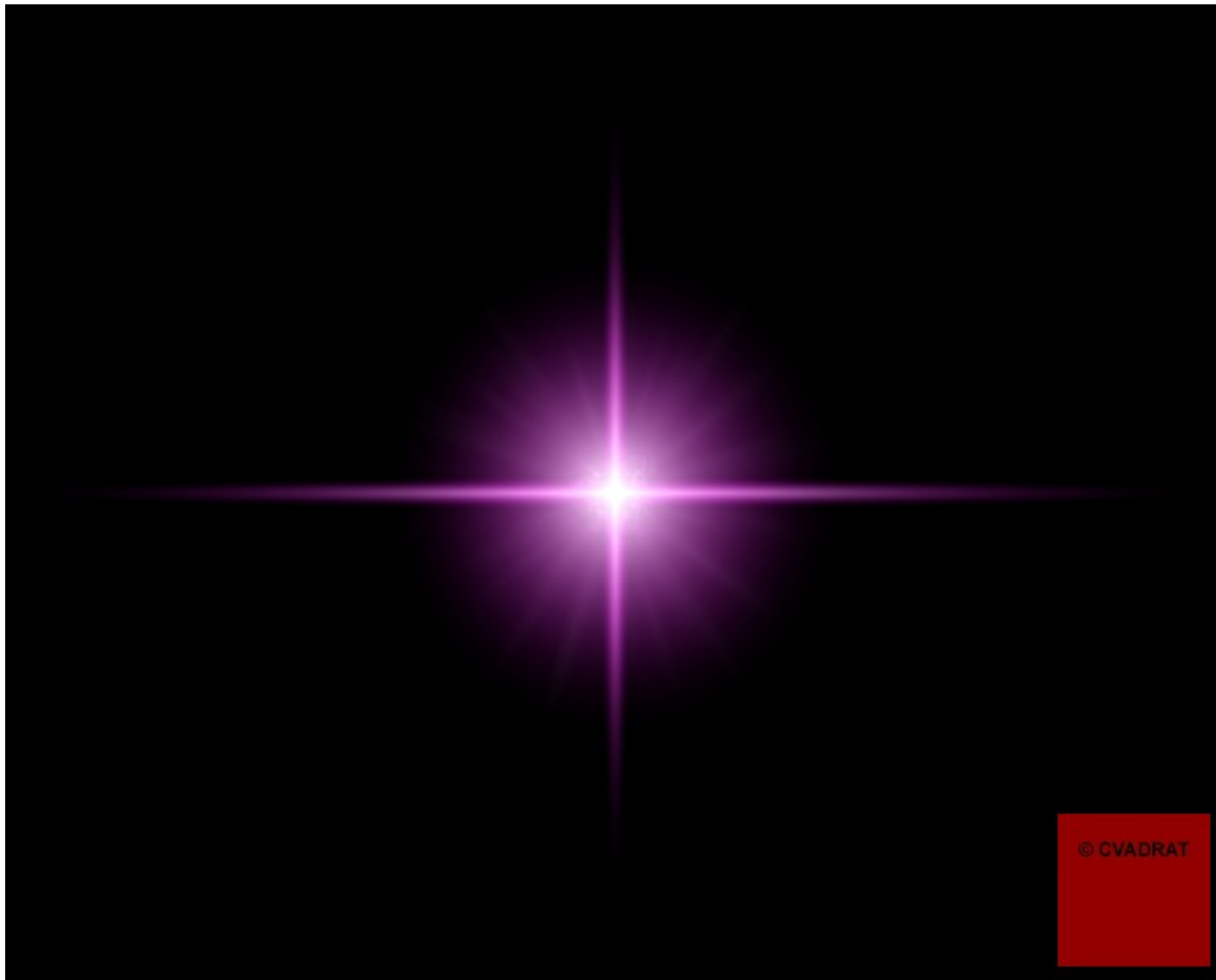
- **rm** stands for “remove”.
 - Needless to say, even more dangerous.



There is **NO UNDO** button in (bash) life

RM

- Try to remove the file in the folder you just copied.
- Get into `$YFF/remove_test/`
- Check the content
- Remove the only file you see



RM

- Now go back to parent folder
- And remove the whole folder `remove_test/`
- Error?
- You need an option.
- By chance it is the same as `cp`: **-r**

MISC commands

command	description	arguments	example
man	Help for other commands	Cmd for info	man cp
history	Shows previous commands	-	history
head	Shows beginning of a file	File position	head file.txt
touch	Creates a file	File position	touch file.txt
du	Shows file dimension	Folder position	du --max-depth 1 ./
sudo	Gives Super user permission	command	sudo rm /

Cats and Pipes



- **cat** is a powerful guy!
- Use it to extract a file content.
- Ex.
 - Go to `$YFF/cat_test/`
 - Try to **cat** the file: `catchmeifyoucan.txt`
 - Suggestion, use autocompletion for the filename

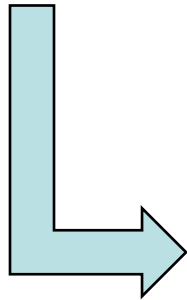
- PIPE is the following symbol: |
- You find it on top of return key (in US)
- Plugs the output of a command to another one

command

Usual flow

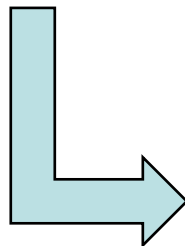


First pipe



command_2

Nth pipe



command_N



Pausa Caffé



PIPE example

- **tr** can be used to remove particular characters
- Option **-d** is used to decide the character

- We will clean my cat mess:

```
cat my_cat_mess.txt
```

pipe!

```
cat my_cat_mess.txt | tr -d “,”
```

PIPE example 2

- **cut** can be used to extract columns
- **-d** is the delimiter, **-f** is the field to extract

- First on few lines, then on all table:

```
head very_long_table.csv | cut -d “,” -f 2
```

```
cat very_long_table.csv | cut -d “,” -f 2
```

MOST EXTREME PIPE example 3

- **sort** | **uniq** combination will tell you the content
- **uniq** does the trick, but it needs a sorted input
- From previous example:

```
cat very_long_table.csv | cut -d “,” -f 2 | sort | uniq
```

- **-c** for **uniq** will print counts too, try!

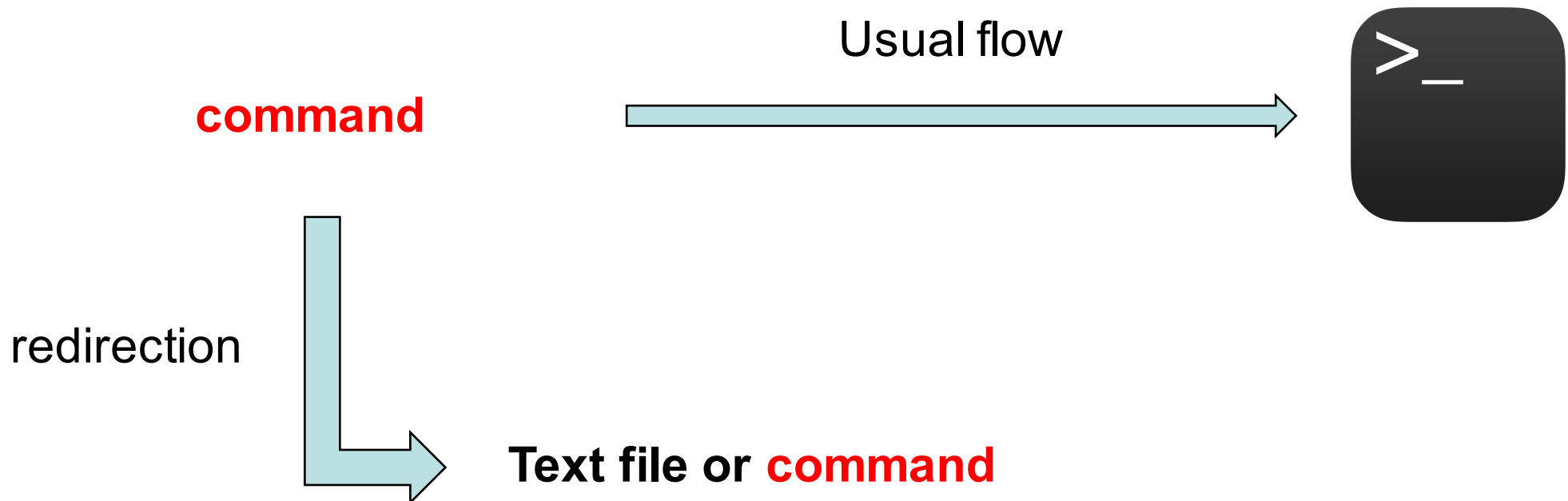
```
cat very_long_table.csv | cut -d “,” -f 2 | sort | uniq -c
```



Cats and Pipes



- REDIRECTION is a special character like PIPE
- > or >>



Example

- Previous command ...
 - Pro tip: use up arrow to retrieve previous commands.
- ... and save into a file in the parent folder

```
cat very_long_table.csv | cut -d "," -f 2 |  
sort | uniq -c > ../long_name_list.tab
```

- Files have 3 permission types:
 - Reading
 - Writing
 - Executing

- 3 users types:
 - Current user
 - Current user group
 - All users

- If you are not able to access a file, it might be because of its **permissions!**

Commands

- `ls -la` is a way to list file permission
- `chmod <permission> <file>` to modify permission
- Try to list current folder files permissions

- Permission table

User	D	U	U	U	G	G	G	O	O	O
Code	d	r	w	x	r	w	x	r	w	x

- Examples:

- drwx----- is a directory with read, write and access only to the owner
- -rw-r--r-- is a file that everyone can read, but only owner can write

Example

- Go to the folder \$YFF/perm_test/
- Create a file: **touch** **secret_file.txt**
- Change the permission of secret_file.txt:

chmod **o-r** **secret_file.txt**

- Extra, number code 7 = r,w,x:

chmod **777** **secret_file.txt**

- grep is a powerful search tool.
- It allows to search through a file

- Go to `grep_test`
- Copy here `very_long_table.csv` from `cat_test`
- Try this:

```
grep shin very_long_table.csv
```

- Thanks!