Overview & Shell

1. Motivation:
    a. add some useful tools to your toolbox
    b. many courses use, no course teaches
2. What is Shell:
    a. old textual interface
    b. core:

       give input, inspect the output
3. Using the shell:
    a. `$` : not root user
    b. `date` : tell you the time:

```
$ date
Sun Jan 15 17:12:08     2023
```

    c. `echo` : print the argument:

```
$ echo hello
hello
$ which echo
/usr/bin/echo
```

    d. shell: programming environment

       run command —> find keywords in the `$PATH`
4. Navigating in the shell:
    a. path —> lists of directories
    b. `pwd` : present working directory:

```
$ pwd
/c/Users/Queen/Desktop/anything
```

c. `cd` : change directory:

```
$ cd ./book/
$ cd ..
$ cd -
/c/Users/Queen/Desktop/anything
```

- absolute path / relative path

d. `ls` : list files

```
$ ls -l ./book/
total 2
-rw-r--r-- 1 Queen 197609 296 Jan 15 03:56 README.md
-rw-r--r-- 1 Queen 197609 128 Jan 15 02:53 SUMMARY.md
drwxr-xr-x 1 Queen 197609   0 Jan 15 03:04 _book/
```

- `d` : directory
- `rwx` : read & write & execute permission

e. `man` : show the manual page

also: `command —-help`

5. Connecting programs:

a. two streams: **input stream & output stream**

usually, keyboard is the input, and the screen is the output

b. very powerful tool: **rewire the I/O stream**

```
$ echo hello > text.txt
$ cat text.txt
hello
$ cat < text.txt > hello.txt
$ cat hello.txt
```

`cat` command can concatenate FILE(s) to standard output

- `< file`: input
- `> file`: output
- pipe operator `|` : chain program together

```
$ ls -l | tail -n3
-rw-r--r-- 1 Queen 197609 5293276 Dec 10 21:22 one dimension people.pdf
-rw-r--r-- 1 Queen 197609       6 Jan 15 17:33 text.txt
drwxr-xr-x 1 Queen 197609       0 Jan  3 00:16 trash/
```

6. Root user:
   a. `sudo` —> root user —> no restriction
   b. change the system parameter in the `sysfs`

      such as brightness of your laptop