



南方科技大学
SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

Assignment 5

ESE 5023

张子严

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1. More linux commands

1. 1 make a link

Pre-requests: ssh to Taiyi Frame and move to the root directory.

```
Last login: Wed Nov 24 20:12:10 on ttys000

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
(base) Ziyans-MacBook-Pro:~ ziyanzhang$ ssh -l ese-zhangzy 172.18.6.175
ese-zhangzy@172.18.6.175's password:
Last login: Wed Nov 24 20:00:46 2021 from gpfsui
Welcome to the SUSTech HPC
```

```
[ese-zhangzy@login01 ~]$ ls
data_demo exam hello.sh
[ese-zhangzy@login01 ~]$ ln -s data_demo data_demo_link
[ese-zhangzy@login01 ~]$ ls
data_demo data_demo_link exam hello.sh
[ese-zhangzy@login01 ~]$
```

In the first question, I create a soft link with `ln -s`.

1.2 Echo

```
[ese-zhangzy@login01 ~]$ var=$(pwd)
[ese-zhangzy@login01 ~]$ echo $var
/work/ese-zhangzy
```

Firstly I propose a variable `var` to carry the `pwd` command, then echo the executed command with `echo $var`.

1.3 Touch

```
[ese-zhangzy@login01 ~]$ cd data_demo/molecules/
[ese-zhangzy@login01 molecules]$ touch test.pdb
[ese-zhangzy@login01 molecules]$ ls -l
total 3
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 1158 Nov 24 19:18 cubane.pdb
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 622 Nov 24 19:18 ethane.pdb
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 422 Nov 24 19:18 methane.pdb
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 1828 Nov 24 19:18 octane.pdb
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 1226 Nov 24 19:18 pentane.pdb
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 825 Nov 24 19:18 propane.pdb
-rw-r--r-- 1 ese-zhangzy ese-ouycc 0 Nov 25 14:03 test.pdb
```

In this section, I first go to the target directory, then make an empty file through touch. At last, I use ls -l to examine the result.

1.4 Find and count

```
[ese-zhangzy@login01 data_demo]$ find data/elements -type f | wc -l
103
```

I use the method fine by type to get a list of files, then concatenate with word count by lines method to determine the number of qualified files.

1.5 Compare with diff

```
[ese-zhangzy@login01 data_demo]$ diff data/pdb/ethane.pdb data/pdb/ethanol.pdb
1,11c1,12
< COMPND      ETHANE
< AUTHOR      DAVE WOODCOCK  95 12 18
< ATOM        1  C          1      -0.752   0.001  -0.141   1.00   0.00
< ATOM        2  C          1       0.752  -0.001   0.141   1.00   0.00
< ATOM        3  H          1     -1.158   0.991   0.070   1.00   0.00
< ATOM        4  H          1     -1.240  -0.737   0.496   1.00   0.00
< ATOM        5  H          1     -0.924  -0.249  -1.188   1.00   0.00
< ATOM        6  H          1      1.158  -0.991  -0.070   1.00   0.00
< ATOM        7  H          1      0.924   0.249   1.188   1.00   0.00
< ATOM        8  H          1      1.240   0.737  -0.496   1.00   0.00
< TER         9           1
---
> COMPND      ETHANOL
> AUTHOR      DAVE WOODCOCK  96 01 03
> ATOM        1  C          1     -0.426  -0.115  -0.147   1.00   0.00
> ATOM        2  O          1     -0.599   1.244  -0.481   1.00   0.00
> ATOM        3  H          1     -0.750  -0.738  -0.981   1.00   0.00
> ATOM        4  H          1     -1.022  -0.351   0.735   1.00   0.00
> ATOM        5  H          1     -1.642   1.434  -0.689   1.00   0.00
> ATOM        6  C          1      1.047  -0.383   0.147   1.00   0.00
> ATOM        7  H          1      1.370   0.240   0.981   1.00   0.00
> ATOM        8  H          1      1.642  -0.147  -0.735   1.00   0.00
> ATOM        9  H          1      1.180  -1.434   0.405   1.00   0.00
> TER        10           1
```

1.6 Grep

```
[ese-zhangzy@login01 data_demo]$ grep -c 'But she' writing/data/LittleWomen.txt
15
```

The command stands for find and count the total line number of 'But she' inside the target file.

1.7 Disk Usage

```
[ese-zhangzy@login01 data_demo]$ du data
407    data/pdb
52     data/elements
1      data/animal-counts
719    data
```

Du command checks the disk usage.

1.8 Zip & Unzip

```
[ese-zhangzy@login01 data_demo]$ cp -r writing/ writing_new/
[ese-zhangzy@login01 data_demo]$ ls
creatures  data_demo_link  north-pacific-gyre  pizza.cfg  thesis        writing
data       molecules       notes               solar.pdf  thesis_backup  writing_new
```

Cp -r means copy the whole directory recursively,

```
[ese-zhangzy@login01 data_demo]$ zip -q -r writing_new.zip writing_new
[ese-zhangzy@login01 data_demo]$ ls
creatures      molecules      pizza.cfg  thesis_backup  writing_new.zip
data           north-pacific-gyre  solar.pdf  writing
data_demo_link  notes         thesis     writing_new
```

Zip -q -r means zip without showing the process, and zip the directory recursively.

```
[ese-zhangzy@login01 data_demo]$ unzip writing_new.zip
Archive:  writing_new.zip
replace writing_new/haiku.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
  inflating: writing_new/haiku.txt
  extracting: writing_new/tools/stats
  extracting: writing_new/tools/old/oldtool
  inflating: writing_new/tools/format
  inflating: writing_new/data/one.txt
  inflating: writing_new/data/LittleWomen.txt
  inflating: writing_new/data/two.txt
  extracting: writing_new/thesis/empty-draft.md
[ese-zhangzy@login01 data_demo]$ ls
creatures      molecules      pizza.cfg  thesis_backup  writing_new.zip
data           north-pacific-gyre  solar.pdf  writing
data_demo_link  notes         thesis     writing_new
```

Upzip the file with replacing the duplicate one.

1.9 Chmod

```
[ese-zhangzy@login01 data_demo]$ chmod 750 writing_new
[ese-zhangzy@login01 data_demo]$ ls -l
total 646
drwxr-xr-x 2 ese-zhangzy ese-ouycc 4096 Nov 24 19:18 creatures
drwxr-xr-x 5 ese-zhangzy ese-ouycc 4096 Nov 24 19:18 data
lrwxrwxrwx 1 ese-zhangzy ese-ouycc 14 Nov 25 13:59 data_demo_link -> data_demo_link
drwxr-xr-x 2 ese-zhangzy ese-ouycc 4096 Nov 25 14:03 molecules
drwxr-xr-x 3 ese-zhangzy ese-ouycc 4096 Nov 24 19:18 north-pacific-gyre
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 69 Nov 24 19:18 notes
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 32 Nov 24 19:18 pizza.cfg
-rwxr-xr-x 1 ese-zhangzy ese-ouycc 21583 Nov 24 19:18 solar.pdf
drwxr-xr-x 3 ese-zhangzy ese-ouycc 4096 Nov 24 20:02 thesis
drwxr-xr-x 3 ese-zhangzy ese-ouycc 4096 Nov 24 20:02 thesis_backup
drwxr-xr-x 5 ese-zhangzy ese-ouycc 4096 Nov 24 19:18 writing
drwxr-x--- 5 ese-zhangzy ese-ouycc 4096 Nov 25 14:23 writing_new
-rw-r--r-- 1 ese-zhangzy ese-ouycc 422584 Nov 25 14:22 writing_new.zip
```

750 stands for all rights for the owner, read and execute only for group users, no access for other users.

1.10 History

```
[ese-zhangzy@login01 data_demo]$ history 10
173  ls
174  unzip writing_new.zip
175  ls
176  chmod writing_new 750
177  chmod 750 writing_new
178  ls -l
179  history -10
180  history -N 10
181  history -n 10
182  history 10
```

2. BASH Coding

Explanation: Use cat to create a BASH file, iterate every file with expansion

'pdb' with command find, then output the count of bytes through command

WC -C.

```
[ese-zhangzy@login01 ~]$ cat > echo_size.sh
#!/bin/bash
for file in $(find data_demo/data/pdb/ -name '*.pdb')
do
wc -c $file
done
^C
[ese-zhangzy@login01 ~]$ sh echo_size.sh
11193 data_demo/data/pdb/lanoxin.pdb
490 data_demo/data/pdb/methanol.pdb
1694 data_demo/data/pdb/citronellal.pdb
2729 data_demo/data/pdb/norethindrone.pdb
4209 data_demo/data/pdb/heme.pdb
2123 data_demo/data/pdb/mustard.pdb
306 data_demo/data/pdb/ammonia.pdb
1444 data_demo/data/pdb/ascorbic-acid.pdb
1064 data_demo/data/pdb/lactic-acid.pdb
422 data_demo/data/pdb/methane.pdb
2288 data_demo/data/pdb/morphine.pdb
2287 data_demo/data/pdb/piperine.pdb
2562 data_demo/data/pdb/maltose.pdb
2787 data_demo/data/pdb/testosterone.pdb
2196 data_demo/data/pdb/thiamine.pdb
3303 data_demo/data/pdb/quinine.pdb
2103 data_demo/data/pdb/tyrian-purple.pdb
2395 data_demo/data/pdb/tuberin.pdb
1090 data_demo/data/pdb/cinnamaldehyde.pdb
2894 data_demo/data/pdb/vitamin-a.pdb
2396 data_demo/data/pdb/ethylcyclohexane.pdb
2675 data_demo/data/pdb/strychnine.pdb
2562 data_demo/data/pdb/sucrose.pdb
1226 data_demo/data/pdb/pentane.pdb
1680 data_demo/data/pdb/nerol.pdb
423 data_demo/data/pdb/vinyl-chloride.pdb
1830 data_demo/data/pdb/camphene.pdb
1516 data_demo/data/pdb/aldrin.pdb
1158 data_demo/data/pdb/cubane.pdb
690 data_demo/data/pdb/ethanol.pdb
5049 data_demo/data/pdb/cholesterol.pdb
895 data_demo/data/pdb/cyclobutane.pdb
1508 data_demo/data/pdb/tnt.pdb
1361 data_demo/data/pdb/vanillin.pdb
1869 data_demo/data/pdb/mint.pdb
1256 data_demo/data/pdb/pyridoxal.pdb
622 data_demo/data/pdb/ethane.pdb
1030 data_demo/data/pdb/benzaldehyde.pdb
3395 data_demo/data/pdb/lsd.pdb
825 data_demo/data/pdb/propane.pdb
1384 data_demo/data/pdb/cyclohexanol.pdb
765 data_demo/data/pdb/glycol.pdb
2452 data_demo/data/pdb/codeine.pdb
1159 data_demo/data/pdb/styrene.pdb
695 data_demo/data/pdb/cyclopropane.pdb
2164 data_demo/data/pdb/menthol.pdb
1828 data_demo/data/pdb/octane.pdb
2562 data_demo/data/pdb/lactose.pdb
[ese-zhangzy@login01 ~]$
```