

1. More Linux Commands

1.1 [2 points] Make a link called data_demo_link to data_demo folder using ln.

```
[ese-maomx@login02 ~]$ ln -s data_demo date_demo_link
[ese-maomx@login02 ~]$ ls
data_demo      err.log  job.log  mpi_demo  t1.py
date_demo_link exam     job.sh   result.log test
```

1.2 [2 points] Print your home directory using echo.

```
[ese-maomx@login02 ~]$ echo '/work/ese-maomx/'
/work/ese-maomx/
```

1.3 [2 points] Go to data_demo/molecules/, make an empty file test.pdb with touch.

```
[ese-maomx@login02 ~]$ cd ~/data_demo/molecules
[ese-maomx@login02 molecules]$ touch test.pdb
[ese-maomx@login02 molecules]$ ls
cubane.pdb ethane.pdb methane.pdb octane.pdb pentane.pdb propane.pdb test.pdb
[ese-maomx@login02 molecules]$
```

1.4 [3 points] Find how many files in data_demo/data/elements/ using find.

```
[ese-maomx@login02 molecules]$ find ~/data_demo/data/elements | wc -l
104
```

1.5 [2 points] Compare data_demo/data/pdb/ethane.pdb and data_demo/data/pdb/ethanol.pdb with diff.

```
[ese-maomx@login02 molecules]$ cd ~/data_demo/data/pdb
[ese-maomx@login02 pdb]$ diff ethane.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
--
> 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
```

1.6 [3 points] Count how many 'But she' string appears in data_demo/writing/data/LittleWomen.txt with grep.

```
[ese-maomx@login02 pdb]$ cd ~/data_demo/writing/data
[ese-maomx@login02 data]$ grep -c 'But she' LittleWomen.txt
grep: ut she: invalid context length argument
[ese-maomx@login02 data]$ grep -c 'But she' LittleWomen.txt
15
```

1.7 [2 points] Check the total file size of the data_demo/data/ folder using du.

```
[ese-maomx@login02 data]$ du ~/data_demo/data
407    /work/ese-maomx/data_demo/data/pdb
52     /work/ese-maomx/data_demo/data/elements
1      /work/ese-maomx/data_demo/data/animal-counts
719    /work/ese-maomx/data_demo/data
```

1.8 [3 points] Copy the data_demo/writing/ folder to data_demo/writing_new/, compress data_demo/writing_new/ using zip, and decompress the .zip file with unzip.

```
[ese-maomx@login02 data]$ cd ~/data_demo/
[ese-maomx@login02 data_demo]$ cp -r writing writing_new
[ese-maomx@login02 data_demo]$ ls
creatures  data  log1  log2  molecules  north-pacific-gyre  notes  pizza.cfg  solar.pdf  writing  writing_new
[ese-maomx@login02 data_demo]$ zip -q -r writing_new.zip writing_new
[ese-maomx@login02 data_demo]$ ls
creatures  data  log1  log2  molecules  north-pacific-gyre  notes  pizza.cfg  solar.pdf  writing  writing_new  writing_new.zip
[ese-maomx@login02 data_demo]$ unzip -q writing_new.zip -d writing_new_from_zip
[ese-maomx@login02 data_demo]$ ls
creatures  log1  molecules  notes  solar.pdf  writing_new  writing_new.zip
data       log2  north-pacific-gyre  pizza.cfg  writing  writing_new_from_zip
```

1.9 [3 points] Change the file permissions flags on writing_new to drwxr-x--- using chmod.

```
[ese-maomx@login02 data_demo]$ ll
total 646
drwxr-xr-x 2 ese-maomx ese-ouycc 4096 Nov 24 19:22 creatures
drwxr-xr-x 5 ese-maomx ese-ouycc 4096 Nov 24 19:22 data
-rw-r--r-- 1 ese-maomx ese-ouycc 100 Dec 3 16:28 log1
-rw-r--r-- 1 ese-maomx ese-ouycc 200 Dec 3 16:28 log2
drwxr-xr-x 2 ese-maomx ese-ouycc 4096 Dec 6 10:44 molecules
drwxr-xr-x 3 ese-maomx ese-ouycc 4096 Nov 24 19:22 north-pacific-gyre
-rwxr-xr-x 1 ese-maomx ese-ouycc 69 Nov 24 19:22 notes
-rwxr-xr-x 1 ese-maomx ese-ouycc 32 Nov 24 19:22 pizza.cfg
-rwxr-xr-x 1 ese-maomx ese-ouycc 21583 Nov 24 19:22 solar.pdf
drwxr-xr-x 5 ese-maomx ese-ouycc 4096 Nov 24 19:22 writing
drwxr-xr-x 5 ese-maomx ese-ouycc 4096 Dec 6 11:01 writing_new
drwxr-xr-x 3 ese-maomx ese-ouycc 4096 Dec 6 11:05 writing_new_from_zip
-rw-r--r-- 1 ese-maomx ese-ouycc 422584 Dec 6 11:04 writing_new.zip
[ese-maomx@login02 data_demo]$ chmod 710 writing_new
[ese-maomx@login02 data_demo]$ ll
total 646
drwxr-xr-x 2 ese-maomx ese-ouycc 4096 Nov 24 19:22 creatures
drwxr-xr-x 5 ese-maomx ese-ouycc 4096 Nov 24 19:22 data
-rw-r--r-- 1 ese-maomx ese-ouycc 100 Dec 3 16:28 log1
-rw-r--r-- 1 ese-maomx ese-ouycc 200 Dec 3 16:28 log2
drwxr-xr-x 2 ese-maomx ese-ouycc 4096 Dec 6 10:44 molecules
drwxr-xr-x 3 ese-maomx ese-ouycc 4096 Nov 24 19:22 north-pacific-gyre
-rwxr-xr-x 1 ese-maomx ese-ouycc 69 Nov 24 19:22 notes
-rwxr-xr-x 1 ese-maomx ese-ouycc 32 Nov 24 19:22 pizza.cfg
-rwxr-xr-x 1 ese-maomx ese-ouycc 21583 Nov 24 19:22 solar.pdf
drwxr-xr-x 5 ese-maomx ese-ouycc 4096 Nov 24 19:22 writing
drwx--x--- 5 ese-maomx ese-ouycc 4096 Dec 6 11:01 writing_new
drwxr-xr-x 3 ese-maomx ese-ouycc 4096 Dec 6 11:05 writing_new_from_zip
-rw-r--r-- 1 ese-maomx ese-ouycc 422584 Dec 6 11:04 writing_new.zip
```

1.10 [3 points] Print the last 10 commands you made using history.

```
[ese-maomx@login02 data_demo]$ history | tail -n 10
132 cp -r writing writing_new
133 ls
134 zip -q -r writing_new.zip writing_new
135 ls
136 unzip -q writing_new.zip -d writing_new_from_zip
137 ls
138 ll
139 chmod 710 writing_new
140 ll
141 history | tail -n 10
```

2. BASH for Loop

```
[ese-maomx@login02 ~]$ cd ~/data_demo/data/pdb
[ese-maomx@login02 pdb]$ nano file_print.sh
[ese-maomx@login02 pdb]$ ./file_print.sh
-bash: ./file_print.sh: Permission denied
[ese-maomx@login02 pdb]$ chmod 750 file_print.sh
[ese-maomx@login02 pdb]$ ./file_print.sh
1516   aldrin.pdb
306    ammonia.pdb
1444   ascorbic-acid.pdb
1030   benzaldehyde.pdb
1830   camphene.pdb
5049   cholesterol.pdb
1090   cinnamaldehyde.pdb
1694   citronellal.pdb
2452   codeine.pdb
1158   cubane.pdb
395    cyclobutane.pdb
1384   cyclohexanol.pdb
695    cyclopropane.pdb
622    ethane.pdb
690    ethanol.pdb
2396   ethylcyclohexane.pdb
765    glycol.pdb
4209   heme.pdb
1064   lactic-acid.pdb
2562   lactose.pdb
11193  lanoxin.pdb
3395   lsd.pdb
2562   maltose.pdb
2164   menthol.pdb
422    methane.pdb
490    methanol.pdb
1869   mint.pdb
2288   morphine.pdb
2123   mustard.pdb
1680   nerol.pdb
2729   norethindrone.pdb
1828   octane.pdb
1226   pentane.pdb
2287   piperine.pdb
325    propane.pdb
1256   pyridoxal.pdb
3303   quinine.pdb
2675   strychnine.pdb
1159   styrene.pdb
2562   sucrose.pdb
2787   testosterone.pdb
2196   thiamine.pdb
1508   tnt.pdb
2395   tuberin.pdb
2103   tyrian-purple.pdb
1361   vanillin.pdb
423    vinyl-chloride.pdb
2894   vitamin-a.pdb
```

file_print.sh 文件

```
for file in *.pdb
do
    du -b $file
done
```