Assignment 05   Good job!

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1. More Linux Commands

In this exercise, we will learn a few more Linux commands. For each command, please use `man` to learn what it does and how to use it correctly. First, change your directory to ~.

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

代码及运行结果如下图：

```
[ese-caozh@login01 data_demo]$ ln -s data_demo_link
[ese-caozh@login01 data_demo]$ ls
creatures   data_demo_link   my_file_new        notes      solar.pdf  writing
data        molecules        north-pacific-gyre pizza.cfg  test
```

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

代码及运行结果如下图：

```
[ese-caozh@login01 ~]$ pwd
/work/ese-caozh
[ese-caozh@login01 ~]$ echo /work/ese-caozh
/work/ese-caozh
```

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

代码及运行结果如下图：

```
[ese-caozh@login01 ~]$ cd data_demo/molecules
[ese-caozh@login01 molecules]$ touch test.pdb
[ese-caozh@login01 molecules]$ ls
cubane.pdb  ethane.pdb  methane.pdb  octane.pdb  pentane.pdb  propane.pdb  test.pdb
```

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

代码及运行结果如下图：

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

1.5 [2 points] Compare `data_demo/data/pdb/ethane.pdb` and

`data_demo/data/pdb/ethanol.pdb` with `diff`.

代码及运行结果如下图：

```
[ese-caozh@login01 ~]$ cd data_demo/data/pdb
[ese-caozh@login01 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             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 [3 points] Count how many `But she` string appears in

`data_demo/writing/data/LittleWomen.txt` with `grep`.

代码及运行结果如下图：

```
[ese-caozh@login01 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`.

代码及运行结果如下图：

```
[ese-caozh@login01 data]$ du -c
407     ./pdb
52      ./elements
1       ./animal-counts
719     .
719     total
```

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`.

代码及运行结果如下图：

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

代码及运行结果如下图：

```
[ese-caozh@login01 data_demo]$ ls -al
total 133
drwxr-xr-x 8 ese-caozh ese-ouycc  4096 Nov 25 19:08 .
drwx------ 6 ese-caozh ese-ouycc  4096 Nov 25 19:06 ..
drwxr-xr-x 2 ese-caozh ese-ouycc  4096 Nov 25 19:06 creatures
drwxr-xr-x 5 ese-caozh ese-ouycc  4096 Nov 25 19:06 data
drwxr-xr-x 2 ese-caozh ese-ouycc  4096 Nov 25 19:06 molecules
drwxr-xr-x 3 ese-caozh ese-ouycc  4096 Nov 25 19:06 north-pacific-gyre
-rwxr-xr-x 1 ese-caozh ese-ouycc    76 Nov 25 19:06 notes
-rwxr-xr-x 1 ese-caozh ese-ouycc    32 Nov 25 19:06 pizza.cfg
-rwxr-xr-x 1 ese-caozh ese-ouycc 21583 Nov 25 19:06 solar.pdf
drwxr-xr-x 5 ese-caozh ese-ouycc  4096 Nov 25 19:06 writing
drwxr-xr-x 5 ese-caozh ese-ouycc  4096 Nov 25 19:08 writing_new
[ese-caozh@login01 data_demo]$ chmod o=--  writing_new
[ese-caozh@login01 data_demo]$ ls -al
total 133
drwxr-xr-x 8 ese-caozh ese-ouycc  4096 Nov 25 19:08 .
drwx------ 6 ese-caozh ese-ouycc  4096 Nov 25 19:06 ..
drwxr-xr-x 2 ese-caozh ese-ouycc  4096 Nov 25 19:06 creatures
drwxr-xr-x 5 ese-caozh ese-ouycc  4096 Nov 25 19:06 data
drwxr-xr-x 2 ese-caozh ese-ouycc  4096 Nov 25 19:06 molecules
drwxr-xr-x 3 ese-caozh ese-ouycc  4096 Nov 25 19:06 north-pacific-gyre
-rwxr-xr-x 1 ese-caozh ese-ouycc    76 Nov 25 19:06 notes
-rwxr-xr-x 1 ese-caozh ese-ouycc    32 Nov 25 19:06 pizza.cfg
-rwxr-xr-x 1 ese-caozh ese-ouycc 21583 Nov 25 19:06 solar.pdf
drwxr-xr-x 5 ese-caozh ese-ouycc  4096 Nov 25 19:06 writing
drwxr-x--- 5 ese-caozh ese-ouycc  4096 Nov 25 19:08 writing_new
[ese-caozh@login01 data_demo]$
```

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

代码及运行结果如下图：

```
[ese-caozh@login01 ~]$ history 10
  177  chmod o- rx writing_new
  178  chmod o-  writing_new
  179  ls -al
  180  chmod o=--  writing_new
  181  ls -al
  182  hitory tail10
  183  history -d 10
  184  cd
  185  hitory 10
  186  history 10
```

2. BASH for Loop

The general syntax of a BASH loop goes like:

```
for thing in list_of_things
do
    operation_using $thing
done
```

[5 points] Write a shell script to print file size (in bytes) of each *.pdb file in data_demo/data/pdb/, line by line.

代码及运行结果如下图：