

1. At this assignment, I would like to report with screenshots. I got help mostly at the websites (<https://swcarpentry.github.io/shell-novice/>), and (<https://www.runoob.com/linux/linux-command-manual.html>), or just tried by myself.
- 1.1. 'ln -s' means soft link, and the first one argument is the target folder, and the second is name of the link.

```
[ese-hejl@login02 ~]$ ls
data_demo exam
[ese-hejl@login02 ~]$ ln -s data_demo/ data_demo_link
[ese-hejl@login02 ~]$ ls
data_demo data_demo_link exam
```

- 1.2. A '~' means home directory.

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

- 1.3. 'touch filename' means creating a file with the filename.

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

- 1.4. 'find . -type f' returns a list of all of the files in different rows, so we can use 'wc -l' to count the rows number which equals to files number.

```
[ese-hejl@login02 ~]$ cd data_demo/data/elements/
[ese-hejl@login02 elements]$ ls
Ac.xml Bk.xml Cs.xml Ga.xml Kr.xml Nb.xml Pd.xml Rn.xml Tb.xml Yb.xml
Ag.xml Br.xml Cu.xml Gd.xml K.xml Nd.xml Pm.xml Ru.xml Tc.xml Y.xml
Al.xml B.xml C.xml Ge.xml La.xml Ne.xml Po.xml Sb.xml Te.xml Zn.xml
Am.xml Ca.xml Dy.xml He.xml Li.xml Ni.xml Pr.xml Sc.xml Th.xml Zr.xml
Ar.xml Cd.xml Er.xml Hf.xml Lr.xml No.xml Pt.xml Se.xml Ti.xml
As.xml Ce.xml Es.xml Hg.xml Lu.xml Np.xml Pu.xml Si.xml Tl.xml
At.xml Cf.xml Eu.xml Ho.xml Md.xml N.xml P.xml Sm.xml Tm.xml
Au.xml Cl.xml Fe.xml H.xml Mg.xml Os.xml Ra.xml Sn.xml U.xml
Ba.xml Cm.xml Fm.xml In.xml Mn.xml O.xml Rb.xml Sr.xml V.xml
Be.xml Co.xml Fr.xml Ir.xml Mo.xml Pa.xml Re.xml S.xml W.xml
Bi.xml Cr.xml F.xml I.xml Na.xml Pb.xml Rh.xml Ta.xml Xe.xml
[ese-hejl@login02 elements]$ find . -type f | wc -l
103
```

- 1.5. 'diff file1 file2' means comparing file1 and file2.

```
[ese-hejl@login02 ~]$ cd data_demo/data/pdb/
[ese-hejl@login02 pdb]$ ls
aldrin.pdb          cyclopropane.pdb    methanol.pdb        strychnine.pdb
ammonia.pdb         ethane.pdb          mint.pdb             styrene.pdb
ascorbic-acid.pdb  ethanol.pdb         morphine.pdb         sucrose.pdb
benzaldehyde.pdb   ethylcyclohexane.pdb mustard.pdb          testosterone.pdb
camphene.pdb       glycol.pdb          nerol.pdb            thiamine.pdb
cholesterol.pdb    heme.pdb            norethindrone.pdb   tnt.pdb
cinnamaldehyde.pdb lactic-acid.pdb     octane.pdb           tuberin.pdb
citronellal.pdb    lactose.pdb         pentane.pdb          tyrian-purple.pdb
codeine.pdb        lanoxin.pdb         piperine.pdb         vanillin.pdb
count.sh           lsd.pdb             print.sh             vinyl-chloride.pdb
cubane.pdb         maltose.pdb         propane.pdb          vitamin-a.pdb
cyclobutane.pdb    menthol.pdb         pyridoxal.pdb
cyclohexanol.pdb   methane.pdb         quinine.pdb

[ese-hejl@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. 'grep str file' means searching for str in the file, and '-c' means returning the counts of all of the results.

```
[ese-hejl@login02 data]$ grep -c 'But she' LittleWomen.txt
15
```

1.7. 'du' returns the size of the working folder, and my working folder is data_demo/data/.

```
[ese-hejl@login02 data]$ du
1281 .
```

1.8. 'cp -r folder newfolder' means copying folder to newfolder. 'zip -q -r file.zip' means compressing all of the files in the working folder with a name 'file.zip'.

```
[ese-hejl@login02 ~]$ cp -r data_demo/writing/ data_demo/writing_new
[ese-hejl@login02 ~]$ cd data_demo/writing
[ese-hejl@login02 writing]$ ls
data haiku.txt thesis tools
[ese-hejl@login02 writing]$ cd ../writing_new/
[ese-hejl@login02 writing_new]$ ls
data haiku.txt thesis tools
```

```
[ese-hejl@login02 writing_new]$ zip -q -r writing_new.zip *
[ese-hejl@login02 writing_new]$ ls
data haiku.txt thesis tools writing_new.zip
```

'unzip file.zip' means decompressing the file.zip. At this time because of the same names of the files, I renamed some of them, and files with '_d' are decompressed files. Other I didn't rename.

```
[ese-hejl@login02 writing_new]$ unzip writing_new.zip
```

```
[ese-hejl@login02 writing_new]$ ls
data empty-draft_d.md haiku.txt one_d.txt tools writing_new.zip
data_e haiku_d.txt LittleWomen_d.txt thesis two_d.txt
```

1.9. 'chmod 750 directory' means changing the permissions flags of directory to 750, and 750 corresponds with 'drwxr-x---'.

```
[ese-hejl@login02 data_demo]$ ll
total 133
drwxr-xr-x 2 ese-hejl ese-ouycc 4096 Nov 24 19:21 creatures
drwxr-xr-x 5 ese-hejl ese-ouycc 4096 Nov 24 19:21 data
drwxr-xr-x 2 ese-hejl ese-ouycc 4096 Dec 2 15:20 molecules
-rw-r--r-- 1 ese-hejl ese-ouycc 22 Nov 24 19:55 my_file_new
drwxr-xr-x 3 ese-hejl ese-ouycc 4096 Nov 24 19:21 north-pacific-gyre
-rwxr-xr-x 1 ese-hejl ese-ouycc 69 Nov 24 19:21 notes
-rwxr-xr-x 1 ese-hejl ese-ouycc 32 Nov 24 19:21 pizza.cfg
-rwxr-xr-x 1 ese-hejl ese-ouycc 21583 Nov 24 19:21 solar.pdf
drwxr-xr-x 2 ese-hejl ese-ouycc 4096 Nov 24 19:57 test
drwxr-xr-x 5 ese-hejl ese-ouycc 4096 Nov 24 19:21 writing
drwxr-xr-x 5 ese-hejl ese-ouycc 4096 Dec 2 16:09 writing_new
[ese-hejl@login02 data_demo]$ chmod 750 writing_new/
[ese-hejl@login02 data_demo]$ ll
total 133
drwxr-xr-x 2 ese-hejl ese-ouycc 4096 Nov 24 19:21 creatures
drwxr-xr-x 5 ese-hejl ese-ouycc 4096 Nov 24 19:21 data
drwxr-xr-x 2 ese-hejl ese-ouycc 4096 Dec 2 15:20 molecules
-rw-r--r-- 1 ese-hejl ese-ouycc 22 Nov 24 19:55 my_file_new
drwxr-xr-x 3 ese-hejl ese-ouycc 4096 Nov 24 19:21 north-pacific-gyre
-rwxr-xr-x 1 ese-hejl ese-ouycc 69 Nov 24 19:21 notes
-rwxr-xr-x 1 ese-hejl ese-ouycc 32 Nov 24 19:21 pizza.cfg
-rwxr-xr-x 1 ese-hejl ese-ouycc 21583 Nov 24 19:21 solar.pdf
drwxr-xr-x 2 ese-hejl ese-ouycc 4096 Nov 24 19:57 test
drwxr-xr-x 5 ese-hejl ese-ouycc 4096 Nov 24 19:21 writing
drwxr-x--- 5 ese-hejl ese-ouycc 4096 Dec 2 16:09 writing_new
```

1.10. 'history 10' returns the last 10 commands I made.

```
[ese-hejl@login02 data_demo]$ history 10
340 rm data_e
341 ls
342 ll
343 cd ..
344 ll
345 chmod 750 writing_new/
346 ll
347 history
348 history | tail 10
349 history 10
```

2. I wrote a for loop at demo.sh. 'du -b \$f' returns all of the sizes of files with '.pdb' in this

folder in bytes. ‘-b’ means sizes in bytes at this case. And it would print line by line.

```
GNU nano 2.3.1      File: demo.sh
for f in *.pdb
do
    du -b $f
done
```

And I changed the permissions flags.

```
[ese-hejl@login02 pdb]$ chmod 750 demo.sh
```

Then I ran it.

```
[ese-hejl@login02 pdb]$ ./demo.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
895   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
825   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 |