

Experiment 1

1.Objective

Get familiar with the Linux operating system environment through experiments and master the use of basic Linux commands.

2.Requirement

- Master the permission management of Linux files
- Master basic file and directory operations
- Linux user management
- File compression and archiving

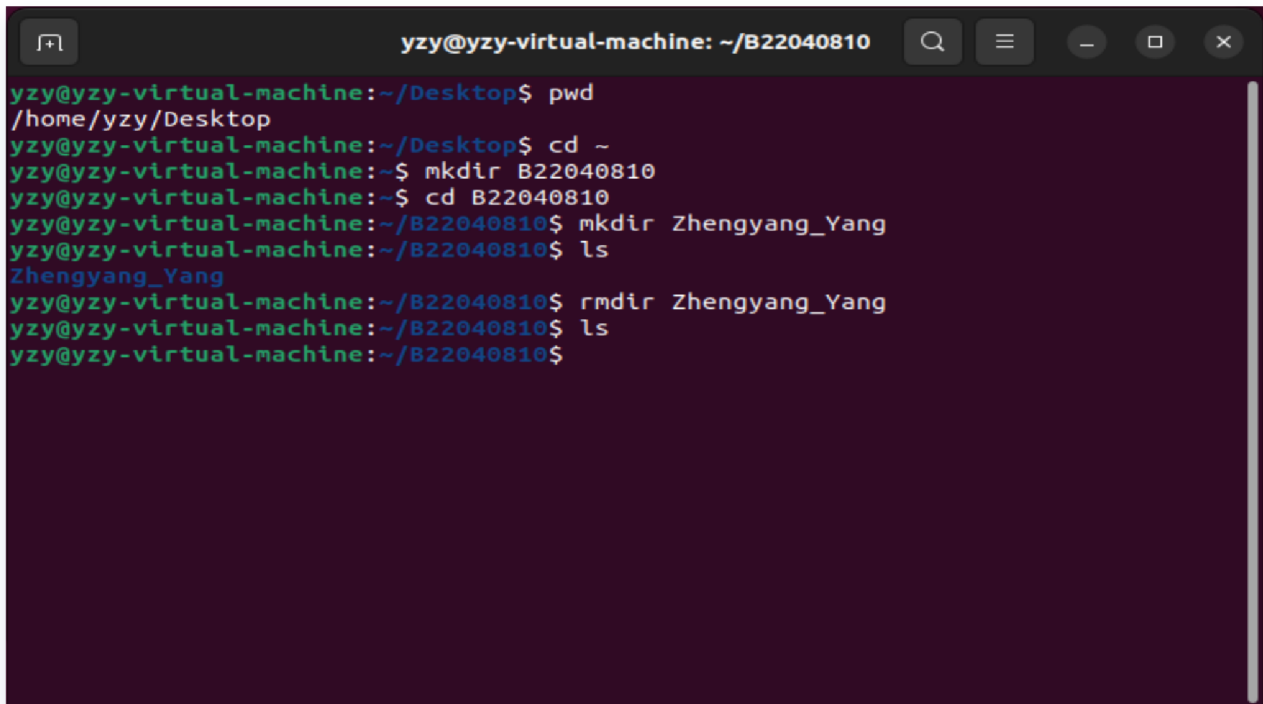
3.Experiment Step

(1)Directory Operation

Enter the following commands in sequence:

```
1  $pwd
2  $cd ~
3  $mkdir your_studentID
4  $cd your_studentID
5  $mkdir your_name
6  $ls
7  $rmdir your_name
8  $ls
```

Save a screenshot of the above command along with the corresponding results, you must have your student number and name.

A terminal window titled 'yzy@yzy-virtual-machine: ~/B22040810'. The terminal shows a sequence of commands and their outputs: 'pwd' returns '/home/yzy/Desktop'; 'cd ~' changes the directory to the home; 'mkdir B22040810' creates a new directory; 'cd B22040810' changes to that directory; 'mkdir Zhengyang_Yang' creates a subdirectory; 'ls' lists the contents, showing 'Zhengyang_Yang'; 'rmdir Zhengyang_Yang' removes the subdirectory; and a final 'ls' command is executed.

```
yzy@yzy-virtual-machine: ~/B22040810
yzy@yzy-virtual-machine:~/Desktop$ pwd
/home/yzy/Desktop
yzy@yzy-virtual-machine:~/Desktop$ cd ~
yzy@yzy-virtual-machine:~$ mkdir B22040810
yzy@yzy-virtual-machine:~$ cd B22040810
yzy@yzy-virtual-machine:~/B22040810$ mkdir Zhengyang_Yang
yzy@yzy-virtual-machine:~/B22040810$ ls
Zhengyang_Yang
yzy@yzy-virtual-machine:~/B22040810$ rmdir Zhengyang_Yang
yzy@yzy-virtual-machine:~/B22040810$ ls
yzy@yzy-virtual-machine:~/B22040810$
```

(2)File operation

Enter the following commands in sequence:

```
1 | $cd ~
2 | $touch yourname.txt
3 | $ls
4 | $echo "hello world" > yourname.txt
5 | $cat yourname.txt
6 | $cp yourname.txt yourname2.txt
7 | $mv yourname.txt yourstudentid.txt
8 | $ls
```

Save a screenshot of the above command along with the corresponding results, you must have your student number and name.

```

yzy@yzy-virtual-machine:~/Desktop$ cd ~
yzy@yzy-virtual-machine:~$ mkdir B22040810
yzy@yzy-virtual-machine:~$ cd B22040810
yzy@yzy-virtual-machine:~/B22040810$ mkdir Zhengyang_Yang
yzy@yzy-virtual-machine:~/B22040810$ ls
Zhengyang_Yang
yzy@yzy-virtual-machine:~/B22040810$ rmdir Zhengyang_Yang
yzy@yzy-virtual-machine:~/B22040810$ ls
yzy@yzy-virtual-machine:~/B22040810$ cd ~
yzy@yzy-virtual-machine:~$ touch Zhengyang_Yang.txt
yzy@yzy-virtual-machine:~$ ls
attacklab  bomblab  Documents  Music      Public  Templates  yzy2003
B22040810  Desktop  Downloads  Pictures   snap    Videos    Zhengyang_Yang.txt
yzy@yzy-virtual-machine:~$ echo "hello world" > Zhengyang_Yang.txt
yzy@yzy-virtual-machine:~$ cat Zhengyang_Yang.txt
hello world
yzy@yzy-virtual-machine:~$ cp Zhengyang_Yang.txt Zhengyang_Yang2.txt
yzy@yzy-virtual-machine:~$ mv Zhengyang_Yang.txt B22040810.txt
yzy@yzy-virtual-machine:~$ ls
attacklab  bomblab  Downloads  Public  Videos
B22040810  Desktop  Music      snap    yzy2003
B22040810.txt  Documents  Pictures   Templates  Zhengyang_Yang2.txt
yzy@yzy-virtual-machine:~$

```

(3)User Management

Enter the following commands in sequence:

- 1 | \$whoami
- 2 | \$sudo su root

Enter the password of the current logged-in user, not the root password, and then enter:

- 1 | #groupadd student
- 2 | #whoami
- 3 | #adduser yourstudentID
- 4 | #usermod -g student yourstudentID

Follow the prompts to create the user and add the user to the student group.

Switch to the user.

- 1 | #su yourstudentID
- 2 | \$cd ~
- 3 | \$touch yourname.txt
- 4 | \$ls -l

View the properties of the file, including the owner user and the group to which the owner user belongs.

```
b22040810@yzy-virtual-machine: ~
yzy@yzy-virtual-machine:~$ whoami
yzy
yzy@yzy-virtual-machine:~$ sudo su root
[sudo] password for yzy:
Sorry, try again.
[sudo] password for yzy:
root@yzy-virtual-machine:/home/yzy# groupadd student
root@yzy-virtual-machine:/home/yzy# whoami
root
root@yzy-virtual-machine:/home/yzy# adduser B22040810
adduser: Please enter a username matching the regular expression configured
via the NAME_REGEX[_SYSTEM] configuration variable. Use the '--force-badname'
option to relax this check or reconfigure NAME_REGEX.
root@yzy-virtual-machine:/home/yzy# adduser b22040810
Adding user 'b22040810' ...
Adding new group 'b22040810' (1002) ...
Adding new user 'b22040810' (1001) with group 'b22040810' ...
Creating home directory '/home/b22040810' ...
Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for b22040810
Enter the new value, or press ENTER for the default
  Full Name []: b22040810
   Room Number []:
    Work Phone []:
    Home Phone []:
      Other []:
Is the information correct? [Y/n] y
root@yzy-virtual-machine:/home/yzy# usermod -g student b22040810
root@yzy-virtual-machine:/home/yzy# su b22040810
b22040810@yzy-virtual-machine:/home/yzy$ cd -
b22040810@yzy-virtual-machine:~$ touch Zhengyang_Yang.txt
b22040810@yzy-virtual-machine:~$ ls -l
total 0
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt
b22040810@yzy-virtual-machine:~$
```

(4) Permission management

Enter the following commands in sequence:

- 1 \$ touch demo
- 2 \$ chmod 777 demo
- 3 \$ chmod a-x demo # result is rw-rw-rw-
- 4 \$ chmod go-w demo # result is rw-r--r--
- 5 \$ chmod g+w demo # result is rw-rw-r--
- 6 \$ chmod a= demo # result is -----
- 7 \$ chmod +t demo # result is -----T
- 8 \$ chmod u+s demo # result is --S-----T
- 9 \$ chmod u+rx demo # result is r-s-----T
- 10 \$ chmod g+rws demo # result is r-srws--T

After entering each line, run `ls -l demo` to view the result.

```
b22040810@zyy-virtual-machine: ~  
b22040810@zyy-virtual-machine:~$ touch demo  
b22040810@zyy-virtual-machine:~$ chmod 777 demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-rw-rw-rw- 1 b22040810 student 0 10月 14 10:16 demo  
b22040810@zyy-virtual-machine:~$ touch Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod a-x demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-rw-rw-rw- 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod go-w demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod go+w demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod a= demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
----- 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod +t demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-----T 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod u+s demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-r-s-----T 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod u+rx demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-r-s-----T 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$ chmod g+rx demo  
b22040810@zyy-virtual-machine:~$ ls -l  
total 0  
-r-srws--T 1 b22040810 student 0 10月 14 10:16 demo  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyy-virtual-machine:~$
```

(5) Other management

Create folder "others" in the main directory of the user, go to the folder, and create two files with the name of any file. Then run the following commands in sequence.

```
1 | $tar -czvf backup.tar.gz others  
2 | $ls -l  
3 | $tar -xzvf backup.tar.gz  
4 | $ls -l
```

Observe changes in the process.

```
b22040810@zyzy-virtual-machine: ~  
b22040810@zyzy-virtual-machine:~$ mkdir others  
b22040810@zyzy-virtual-machine:~$ cd others  
b22040810@zyzy-virtual-machine:~/others$ touch a.txt  
b22040810@zyzy-virtual-machine:~/others$ touch b.txt  
b22040810@zyzy-virtual-machine:~/others$ ls  
a.txt  b.txt  
b22040810@zyzy-virtual-machine:~/others$ tar -czvf backup.tar.gz others  
tar: others: Cannot stat: No such file or directory  
tar: Exiting with failure status due to previous errors  
b22040810@zyzy-virtual-machine:~/others$ cd -  
b22040810@zyzy-virtual-machine:~$ tar -czvf backup.tar.gz others  
others/  
others/backup.tar.gz  
others/a.txt  
others/b.txt  
b22040810@zyzy-virtual-machine:~$ ls -l  
total 8  
-rw-r--r-- 1 b22040810 student 256 10月 14 10:32 backup.tar.gz  
-r-srwS--T 1 b22040810 student 0 10月 14 10:16 demo  
drwxr-xr-x 2 b22040810 student 4096 10月 14 10:28 others  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyzy-virtual-machine:~$ tar -xzvf backup.tar.gz  
others/  
others/backup.tar.gz  
others/a.txt  
others/b.txt  
b22040810@zyzy-virtual-machine:~$ ls -l  
total 8  
-rw-r--r-- 1 b22040810 student 256 10月 14 10:32 backup.tar.gz  
-r-srwS--T 1 b22040810 student 0 10月 14 10:16 demo  
drwxr-xr-x 2 b22040810 student 4096 10月 14 10:28 others  
-rw-r--r-- 1 b22040810 student 0 10月 14 10:11 Zhengyang_Yang.txt  
b22040810@zyzy-virtual-machine:~$
```

Create a textfile file and make it as follows:

```
1 | no, I study in njupt.  
2 | this line ends with 00  
3 | this line ends with .00  
4 | I am 25 years old.  
5 | He is 15. It is 16.00  
6 | wy is the short of my name.
```

Search for all lines beginning with the character "n" in the file textfile

```
1 | $ grep '^n' textfile
```

Search the textfile for all lines ending in ".00"

```
1 | $ grep '\.00$' textfile
```

Search for all lines in the textfile that contain the number 5, followed by the character ".", followed by any character

```
1 | $ grep '5\..' textfile
```

Search for all lines starting with the characters "w" and "y" in the file textfile

1 | \$ grep '^[wy]'textfile

```
b22040810@zyzy-virtual-machine:~$ echo "no,I study in njupt." > B22040810.txt
b22040810@zyzy-virtual-machine:~$ echo "this line ends with 00" >> B22040810.txt
b22040810@zyzy-virtual-machine:~$ echo "this line ends with .00" >> B22040810.txt
b22040810@zyzy-virtual-machine:~$ echo "I am 25 years old." >> B22040810.txt
b22040810@zyzy-virtual-machine:~$ echo "He is 15.It is 16.00." >> B22040810.txt
b22040810@zyzy-virtual-machine:~$ echo "wy is the short of my name." >> B22040810.txt
b22040810@zyzy-virtual-machine:~$ grep '^n' B22040810.txt
no,I study in njupt.
b22040810@zyzy-virtual-machine:~$ grep '\.00$' B22040810.txt
this line ends with 00
this line ends with .00
b22040810@zyzy-virtual-machine:~$ grep '5\.' B22040810.txt
He is 15.It is 16.00.
b22040810@zyzy-virtual-machine:~$ grep '^[wy]' B22040810.txt
wy is the short of my name.
b22040810@zyzy-virtual-machine:~$
```