

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

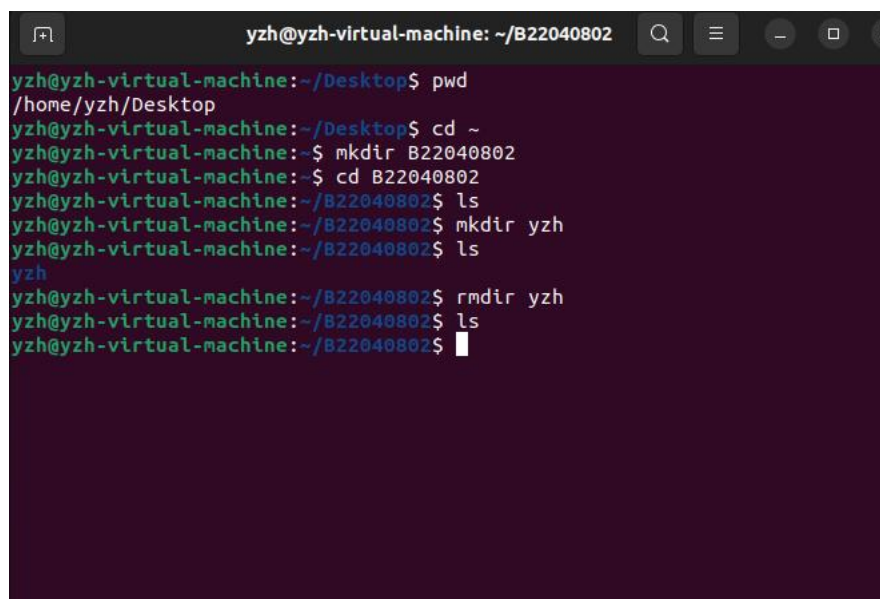
3. Experiment Step

(1) Directory Operation

Enter the following commands in sequence:

```
$pwd
$cd ~
$mkdir your_studentID
$cd your_studentID
$mkdir your_name
$ls
$rmkdir your_name
$ls
```

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

A screenshot of a terminal window titled 'yzh@yzh-virtual-machine: ~/B22040802'. The terminal shows a sequence of commands and their outputs: 'pwd' returns '/home/yzh/Desktop'; 'cd ~' changes the directory to the home directory; 'mkdir B22040802' creates a new directory; 'cd B22040802' changes the directory to the newly created one; 'ls' shows the current directory is empty; 'mkdir yzh' creates a subdirectory; 'ls' shows the subdirectory 'yzh'; 'rmdir yzh' removes the subdirectory; and a final 'ls' command shows the directory is empty again.

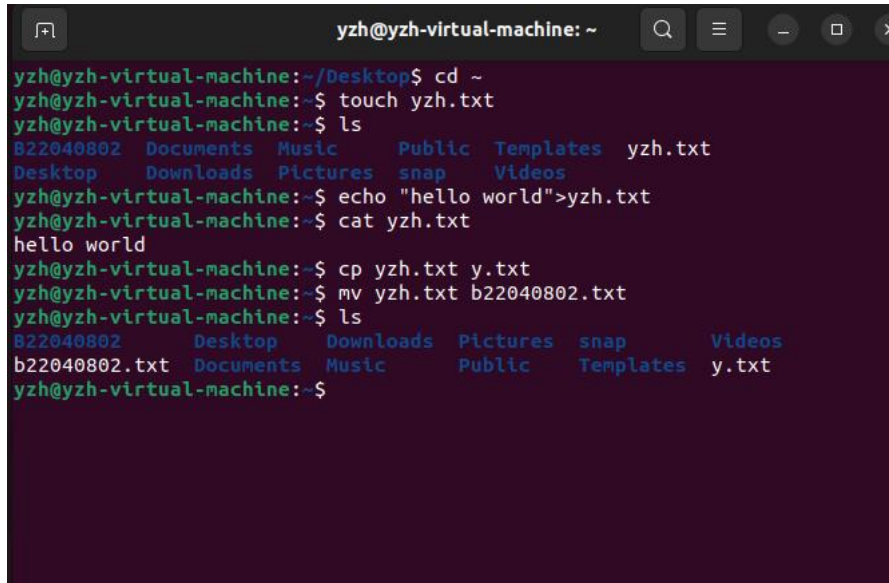
```
yzh@yzh-virtual-machine: ~/B22040802
yzh@yzh-virtual-machine:~/Desktop$ pwd
/home/yzh/Desktop
yzh@yzh-virtual-machine:~/Desktop$ cd ~
yzh@yzh-virtual-machine:~$ mkdir B22040802
yzh@yzh-virtual-machine:~$ cd B22040802
yzh@yzh-virtual-machine:~/B22040802$ ls
yzh@yzh-virtual-machine:~/B22040802$ mkdir yzh
yzh@yzh-virtual-machine:~/B22040802$ ls
yzh
yzh@yzh-virtual-machine:~/B22040802$ rmdir yzh
yzh@yzh-virtual-machine:~/B22040802$ ls
yzh@yzh-virtual-machine:~/B22040802$
```

(2) File operation

Enter the following commands in sequence:

```
$cd ~  
$touch yourname.txt  
$ls  
$echo "hello world" > yourname.txt  
$cat yourname.txt  
$cp yourname.txt yourname2.txt  
$mv yourname.txt yourstudentid.txt  
$ls
```

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



```
yzh@yzh-virtual-machine: ~  
yzh@yzh-virtual-machine:~/Desktop$ cd ~  
yzh@yzh-virtual-machine:~$ touch yzh.txt  
yzh@yzh-virtual-machine:~$ ls  
B22040802 Documents Music Public Templates yzh.txt  
Desktop Downloads Pictures snap Videos  
yzh@yzh-virtual-machine:~$ echo "hello world">yzh.txt  
yzh@yzh-virtual-machine:~$ cat yzh.txt  
hello world  
yzh@yzh-virtual-machine:~$ cp yzh.txt y.txt  
yzh@yzh-virtual-machine:~$ mv yzh.txt b22040802.txt  
yzh@yzh-virtual-machine:~$ ls  
B22040802 Desktop Downloads Pictures snap Videos  
b22040802.txt Documents Music Public Templates y.txt  
yzh@yzh-virtual-machine:~$
```

(3) User Management

Enter the following commands in sequence:

```
$whoami  
$sudo su root
```

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

```
#groupadd student  
#whoami  
#adduser yourstudentID  
#usermod -g student yourstudentID
```

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

Switch to the user.

```
#su yourstudentID  
$cd ~  
$touch yourname.txt  
$ls -l
```

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

```
yzh@yzh-virtual-machine:~$ whoami  
yzh  
yzh@yzh-virtual-machine:~$ sudo su root  
[sudo] password for yzh:  
root@yzh-virtual-machine:/home/yzh# groupadd student  
root@yzh-virtual-machine:/home/yzh# whoami  
root  
root@yzh-virtual-machine:/home/yzh# adduser b22040802  
Adding user `b22040802' ...  
Adding new group `b22040802' (1002) ...  
Adding new user `b22040802' (1001) with group `b22040802' ...  
Creating home directory `/home/b22040802' ...  
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 b22040802  
Enter the new value, or press ENTER for the default  
Full Name []: yzh  
Room Number []: 210  
Work Phone []: 15895873536  
Home Phone []: 15893028140  
Other []: 12847  
Is the information correct? [Y/n] y  
root@yzh-virtual-machine:/home/yzh# usermod -g student b22040802  
Command 'usermod' not found, did you mean:  
  command 'usermod' from deb passwd (1:4.8.1-2ubuntu2.2)  
Try: apt install <deb name>  
root@yzh-virtual-machine:/home/yzh#
```

(4) Permission management

Enter the following commands in sequence:

```

$ touch demo
$ chmod 777 demo
$ chmod a-x demo      # result is rw-rw-rw-
$ chmod go-w demo     # result is rw-r--r--
$ chmod g+w demo      # result is rw-rw-r--
$ chmod a= demo       # result is -----
$ chmod +t demo       # result is -----T
$ chmod u+s demo      # result is --S-----T
$ chmod u+rx demo     # result is r-s-----T
$ chmod g+rws demo    # result is r-srws--T

```

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

```

b22040802@yzh-virtual-machine:~$ touch demo
b22040802@yzh-virtual-machine:~$ chmod 777 demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-rwxrwxrwx 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod a-x demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-rw-rw-rw- 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod go-w demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-rw-r--r-- 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod g+w demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-rw-rw-r-- 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod a= demo
b22040802@yzh-virtual-machine:~$ ls -l demo
----- 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod +t demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-----T 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod u+s demo
b22040802@yzh-virtual-machine:~$ ls -l demo
---S-----T 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod u+rx demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-r-s-----T 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ chmod g+rws demo
b22040802@yzh-virtual-machine:~$ ls -l demo
-r-srws--T 1 b22040802 b22040802 0 10月 21 10:13 demo
b22040802@yzh-virtual-machine:~$ tar -czvf backup.tar.gz others
tar: others: Cannot stat: No such file or directory
tar: Exiting with failure status due to previous errors
b22040802@yzh-virtual-machine:~$ ls -l
total 4
-rw-rw-r-- 1 b22040802 b22040802 45 10月 21 10:18 backup.tar.gz
-r-srws--T 1 b22040802 b22040802 0 10月 21 10:13 demo
-rw-rw-r-- 1 b22040802 b22040802 0 10月 21 10:07 yzh.txt
b22040802@yzh-virtual-machine:~$ tar -xzvf backup.tar.gz
b22040802@yzh-virtual-machine:~$ ls -l
total 4
-rw-rw-r-- 1 b22040802 b22040802 45 10月 21 10:18 backup.tar.gz
-r-srws--T 1 b22040802 b22040802 0 10月 21 10:13 demo

```

(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.

```

$tar -czvf backup.tar.gz others
$ls -l

$tar -xzvf backup.tar.gz
$ls -l

```

Observe changes in the process.

Create a textfile file and make it as follows:

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

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

```
$ grep '^n' textfile
```

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

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

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

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

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

```
$ grep '^[wy]' textfile
```

```
yzh@yzh-virtual-machine:~/Desktop$ cd ~  
yzh@yzh-virtual-machine:~$ touch 1111.txt  
yzh@yzh-virtual-machine:~$ grep '^n' 1111.txt  
no, I study in njupt.  
yzh@yzh-virtual-machine:~$ grep '\.00$' 1111.txt  
this line ends with .00  
He is 15. It is 16.00  
yzh@yzh-virtual-machine:~$ grep '5\..' 1111.txt  
He is 15. It is 16.00  
yzh@yzh-virtual-machine:~$ grep '^[wy]' 1111.txt  
wy is the short of my name.  
yzh@yzh-virtual-machine:~$
```