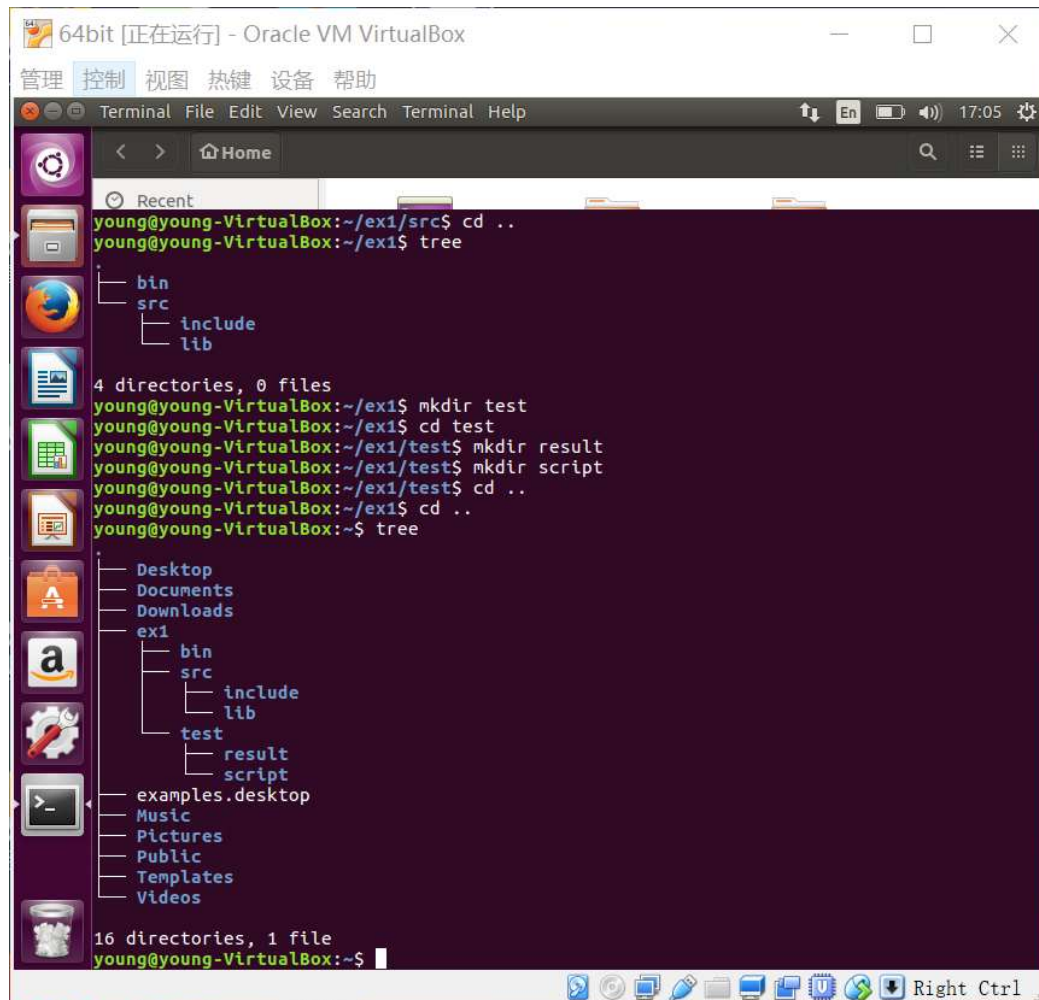


Ex1

Using cd mkdir tree command



The screenshot shows a terminal window titled "64bit [正在运行] - Oracle VM VirtualBox". The terminal output is as follows:

```
young@young-VirtualBox:~/ex1/src$ cd ..
young@young-VirtualBox:~/ex1$ tree
.
├── bin
├── src
│   ├── include
│   └── lib
└── 4 directories, 0 files

young@young-VirtualBox:~/ex1$ mkdir test
young@young-VirtualBox:~/ex1$ cd test
young@young-VirtualBox:~/ex1/test$ mkdir result
young@young-VirtualBox:~/ex1/test$ mkdir script
young@young-VirtualBox:~/ex1/test$ cd ..
young@young-VirtualBox:~/ex1$ cd ..
young@young-VirtualBox:~$ tree
.
├── Desktop
├── Documents
├── Downloads
├── ex1
│   ├── bin
│   ├── src
│   │   ├── include
│   │   └── lib
│   └── test
│       ├── result
│       └── script
├── examples.desktop
├── Music
├── Pictures
├── Public
├── Templates
└── Videos
16 directories, 1 file
young@young-VirtualBox:~$
```

Tab for anto complete

Option -p means no error if existing,make parent dir if needed

e.g.:this ex we can use <mkdir -p ex1/src/include >for efficiency

Ex2

Using cp ln ls -Rla

```

young@young-VirtualBox:~$ ls -la
total 28
drwxr-xr-x 5 young young 4096 ott  8 17:14 .
drwxr-xr-x 18 young young 4096 ott  8 17:17 ..
drwxr-xr-x 2 young young 4096 ott  8 17:29 bin
drwxr-xr-x 4 young young 4096 ott  8 17:01 src
drwxr-xr-x 4 young young 4096 ott  8 17:25 test

./bin:
total 12
drwxr-xr-x 2 young young 4096 ott  8 17:29 .
drwxr-xr-x 5 young young 4096 ott  8 17:14 ..
-rw-rw-r-- 3 young young 1868 ott  8 17:22 t2

./src:
total 16
drwxr-xr-x 4 young young 4096 ott  8 17:01 .
drwxr-xr-x 4 young young 4096 ott  8 17:14 ..
drwxr-xr-x 2 young young 4096 ott  8 17:01 include
drwxr-xr-x 2 young young 4096 ott  8 17:01 lib

./src/include:
total 8
drwxr-xr-x 2 young young 4096 ott  8 17:01 .
drwxr-xr-x 4 young young 4096 ott  8 17:01 ..

./src/lib:
total 8
drwxr-xr-x 2 young young 4096 ott  8 17:01 .
drwxr-xr-x 4 young young 4096 ott  8 17:01 ..

./test:
total 28
drwxr-xr-x 4 young young 4096 ott  8 17:25 .
drwxr-xr-x 5 young young 4096 ott  8 17:14 ..
drwxr-xr-x 2 young young 4096 ott  8 17:02 result
drwxr-xr-x 2 young young 4096 ott  8 17:02 script
-rw-rw-r-- 3 young young 1868 ott  8 17:22 t1
-rw-rw-r-- 3 young young 1868 ott  8 17:19 text01.txt
-rw-rw-r-- 3 young young 1868 ott  8 17:22 text01

./test/result:
total 8
drwxr-xr-x 2 young young 4096 ott  8 17:02 .
drwxr-xr-x 4 young young 4096 ott  8 17:25 ..

./test/script:
total 8
drwxr-xr-x 2 young young 4096 ott  8 17:02 .
drwxr-xr-x 4 young young 4096 ott  8 17:25 ..

```

5. Explain the meaning of the number of links associated to each file or directory.

First block for dir ex1:

```

.      5    for itself,parent dir,bin,src,test
..     18   parent dir
bin    2    itself,parent(ex1)
src    4    itself,parent(ex1),include,lib
test   4    itself,parent(ex1),result,script

```

Second block for ./bin:

```

.      2    for itself,parent (no link for t2,link in don't have the link from the parent dir)
..     5    parent dir(ex1) have 5 link
t2     3    three link to text01(t1,t2,text01)

```

third block for ./src:

```

.      2    for itself,parent,include,lib
..     5    parent dir(ex1) have 5 link
Include 2    itself,parent
Lib      2    itself,parent

```

And so on...

That means regular files have link only to them self like text01.txt,t1,t2

Directory files have link to them self and parent and the subdirectory

We can see how many hard link to a file eg.the link to text01.txt is 3

6. Remove file **text01**, and display the content of **t2**. Does it work? Why?

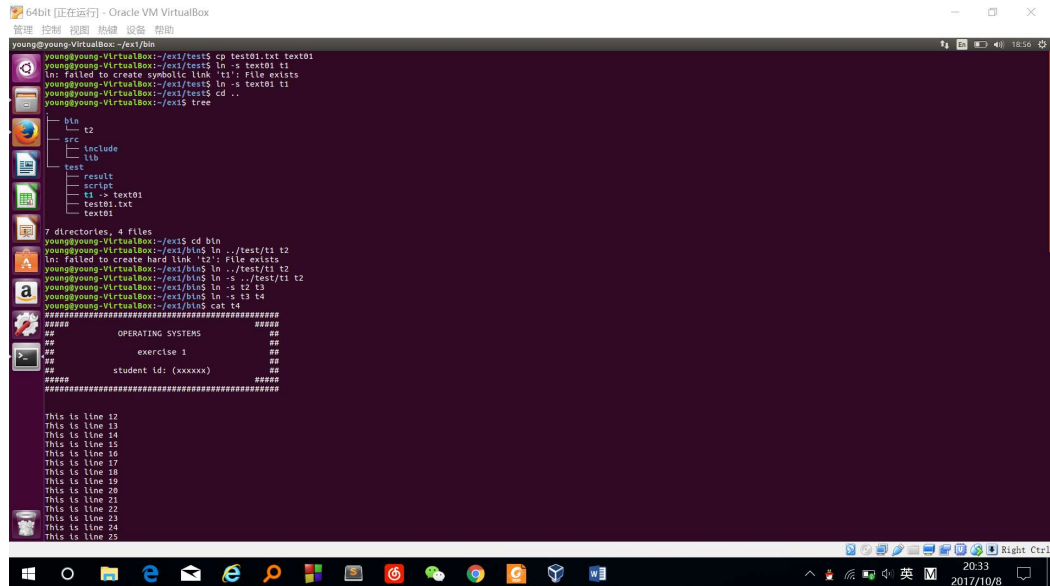
Using rm cat.

it works

Because hard link is like given multiple name to a file. Only delete the file can be delete if all link to the file has been deleted

Ex3

Using ln -s



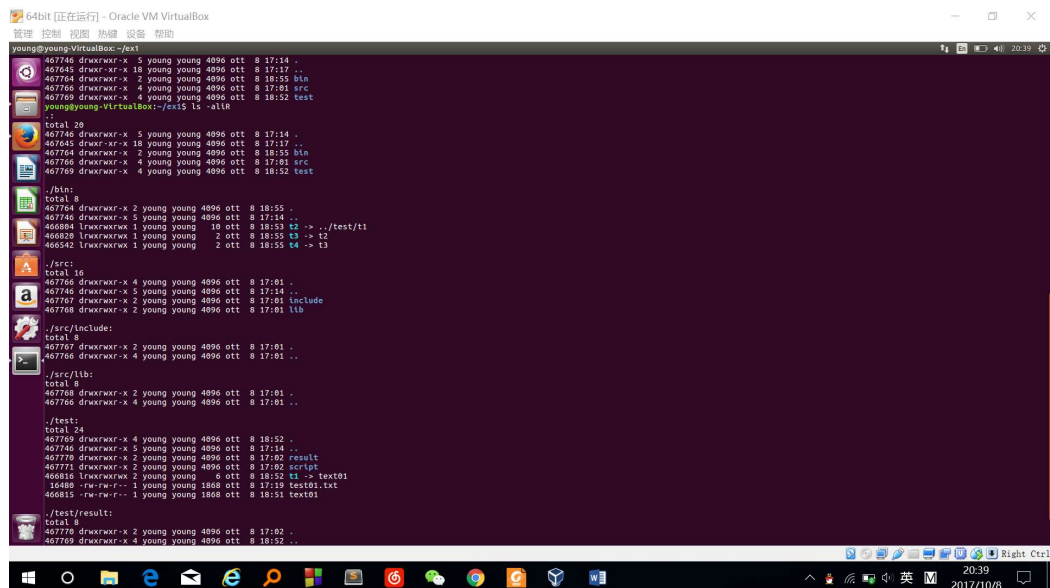
```
young@young-VirtualBox:~/ex1/bin
young@young-VirtualBox:~/ex1/test5$ cp test01.txt test01
young@young-VirtualBox:~/ex1/test5$ ln -s test01 t1
ln: failed to create symbolic link 't1': File exists
young@young-VirtualBox:~/ex1/test5$ ln -s test01 t1
young@young-VirtualBox:~/ex1/test5$ cd ..
young@young-VirtualBox:~/ex1$ tree
.
├── bin
├── t2
├── include
├── lib
├── test1
├── result
├── script
├── t1 -> test01
├── test01.txt
└── test01

7 directories, 4 files
young@young-VirtualBox:~/ex1$ cd bin
young@young-VirtualBox:~/ex1/bin$ ln -s ../test/t1 t2
ln: failed to create hard link 't2': File exists
young@young-VirtualBox:~/ex1/bin$ ln -s ../test/t1 t2
young@young-VirtualBox:~/ex1/bin$ ln -s t2 t3
young@young-VirtualBox:~/ex1/bin$ ln -s t3 t4
young@young-VirtualBox:~/ex1/bin$ cat t4
#####
##          OPERATING SYSTEMS          ##
##                                     ##
##          exercise 1                  ##
##                                     ##
##          student id: (xxxxxx)        ##
##                                     ##
#####
This is line 12
This is line 13
This is line 14
This is line 15
This is line 16
This is line 17
This is line 18
This is line 19
This is line 20
This is line 21
This is line 22
This is line 23
This is line 24
This is line 25
```

3. Continue creating soft link **t3** to **t2**, **t4** to **t3**,... , **ti** to **t(i-1)**. Is there any limit?

No limit

4. List all files, and their attributes, in **ex1** and its subdirectories



```
young@young-VirtualBox:~/ex1$ ls -la
total 20
drwxr-xr-x 5 young young 4096 ott 8 17:14 .
drwxr-xr-x 18 young young 4096 ott 8 17:17 ..
drwxr-xr-x 2 young young 4096 ott 8 18:55 bin
drwxr-xr-x 4 young young 4096 ott 8 18:55 src
drwxr-xr-x 4 young young 4096 ott 8 18:52 test

./bin:
total 8
drwxr-xr-x 2 young young 4096 ott 8 18:55 .
drwxr-xr-x 5 young young 4096 ott 8 17:14 ..
lrwxrwxrwx 1 young young 10 ott 8 18:53 t2 -> ../test/t1
lrwxrwxrwx 1 young young 2 ott 8 18:55 t3 -> t2
lrwxrwxrwx 1 young young 2 ott 8 18:55 t4 -> t3

./src:
total 16
drwxr-xr-x 4 young young 4096 ott 8 17:01 .
drwxr-xr-x 5 young young 4096 ott 8 17:14 ..
drwxr-xr-x 2 young young 4096 ott 8 17:01 include
drwxr-xr-x 2 young young 4096 ott 8 17:01 lib

./src/include:
total 8
drwxr-xr-x 2 young young 4096 ott 8 17:01 .
drwxr-xr-x 4 young young 4096 ott 8 17:01 ..

./src/lib:
total 8
drwxr-xr-x 2 young young 4096 ott 8 17:01 .
drwxr-xr-x 4 young young 4096 ott 8 17:01 ..

./test:
total 24
drwxr-xr-x 4 young young 4096 ott 8 18:52 .
drwxr-xr-x 5 young young 4096 ott 8 17:14 ..
drwxr-xr-x 2 young young 4096 ott 8 17:02 result
drwxr-xr-x 2 young young 4096 ott 8 17:02 script
lrwxrwxrwx 6 ott 8 18:52 t1 -> test01
-rw-rw-r-- 1 young young 1868 ott 8 17:19 test01.txt
-rw-rw-r-- 1 young young 1868 ott 8 18:51 test01.txt

./test/result:
total 8
drwxr-xr-x 2 young young 4096 ott 8 17:02 .
drwxr-xr-x 4 young young 4096 ott 8 18:52 ..
```

5. Explain the meaning of the number of links associated to each file. ???

T1 2 to test01.txt, t2 to t1

T2,t3,t4 1 itself

6. Remove file **text01**, and display the content of **t4**. Does it work? Why?

Cant display.

No such file

Because t4 is like a pointer to file t3 to t2 to t1 to text01.system don't know what the refer to is.

7. Remove all file **t** in **bin** with a single command

Rm t*

EX4

1 as main.c soure code

2 less means view file on terminal page

Using absolute path and relative path

Cd ls tree

3. mv delete source file and create a new file

4.-Wall means display all warning information after compile

6.

```
64bit [正在运行] - Oracle VM VirtualBox
管理 控制 视图 热键 设备 帮助
young@young-VirtualBox: ~/ex1/test
lrwxrwxrwx 1 young young 6 ott 10 20:57 t2 -> text01
lrwxrwxrwx 1 young young 2 ott 10 20:58 t3 -> t2
-rw-rw-r-- 1 young young 1868 ott 8 17:19 test01.txt
-rw-rw-r-- 1 young young 1868 ott 10 20:56 text01
young@young-VirtualBox:~/ex1/test$ ./myWC
error number of argument
err open the file!
Segmentation fault (core dumped)
young@young-VirtualBox:~/ex1/test$ man chmod
young@young-VirtualBox:~/ex1/test$ chmod u -x
chmod: cannot access 'u': No such file or directory
young@young-VirtualBox:~/ex1/test$ chmod u-x myWC
young@young-VirtualBox:~/ex1/test$ ls -l
total 32
-rw-rw-r-- 1 young young 898 ott 12 00:19 main.c
-rw-rwxr-x 1 young young 8864 ott 12 00:35 myWC
drwxrwxr-x 2 young young 4096 ott 12 00:28 result
drwxrwxr-x 2 young young 4096 ott 12 00:22 script
lrwxrwxrwx 2 young young 6 ott 8 18:52 t1 -> text01
lrwxrwxrwx 1 young young 6 ott 10 20:57 t2 -> text01
lrwxrwxrwx 1 young young 2 ott 10 20:58 t3 -> t2
-rw-rw-r-- 1 young young 1868 ott 8 17:19 test01.txt
-rw-rw-r-- 1 young young 1868 ott 10 20:56 text01
young@young-VirtualBox:~/ex1/test$ ./myWC
bash: ./myWC: Permission denied
young@young-VirtualBox:~/ex1/test$ chmod u+x myWC
young@young-VirtualBox:~/ex1/test$
```

Ex5

2.because myWC is not in current dir

4wc -w