

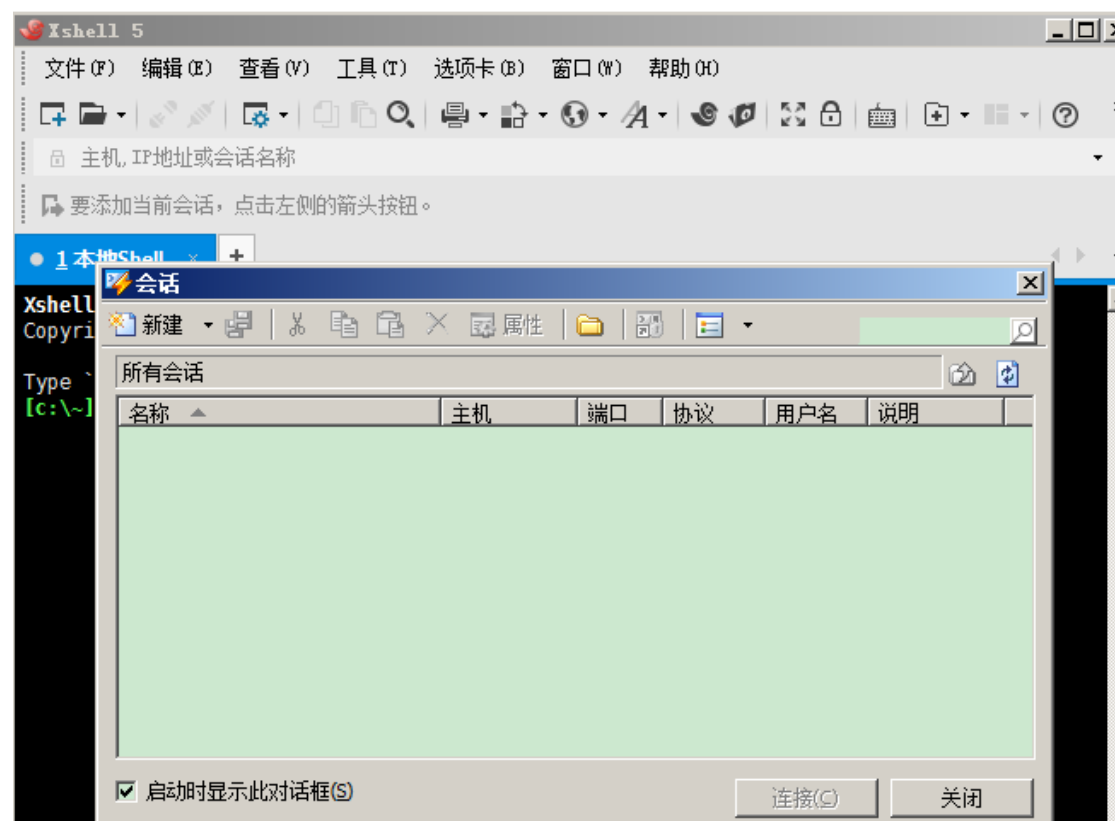
今天的学习内容一共有以下几点：

1. 连接服务器
2. 本地和服务端之间的文件传输。
3. 如何建立脚本文件，以 R 脚本为例。
4. 运行 R 脚本文件。
5. 如何在后台执行程序。
6. 杀死某进程。
7. 如何定期执行程序。
8. 杀死该定期执行程序。
9. 修改文件夹的访问权限。

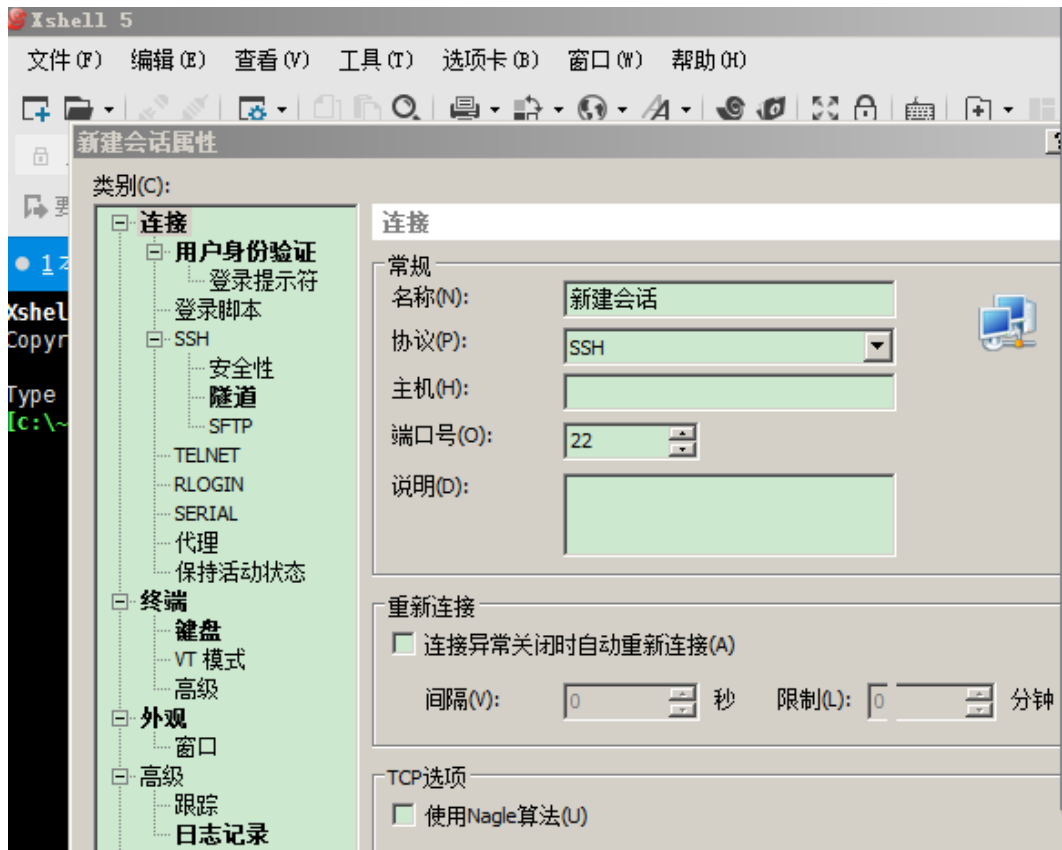
1. 连接服务器：[ssh sigma@10.53.0.3](ssh://sigma@10.53.0.3)



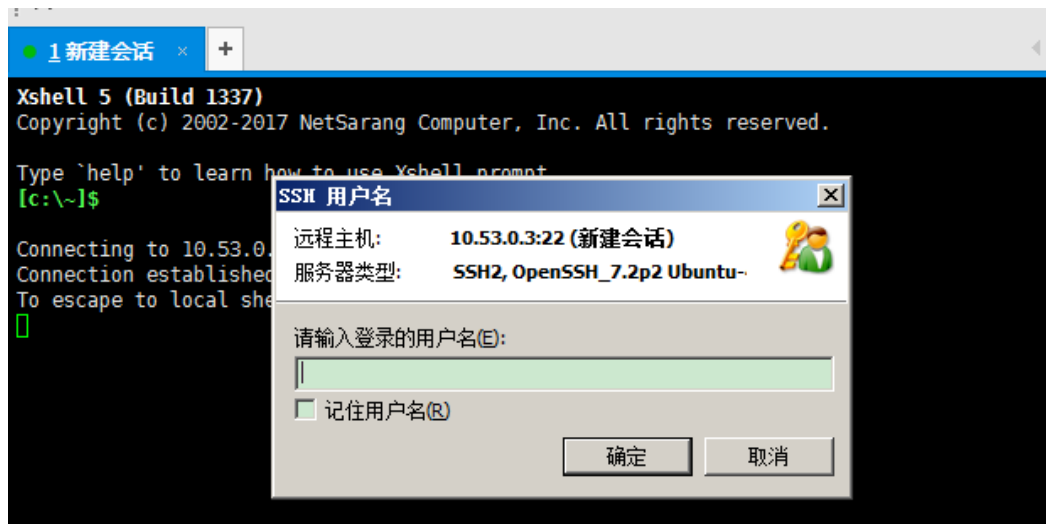
点击图标 Xshell 5，出现界面如下



点击新建，新建会话。



填写主机 ip 号：**10.53.0.3**。端口号为 22。点击确定后连接，出面如下界面。输入用户名。



点击确定后再输入密码。连接成功。然后应用命令 `cd /home`，就进入了根目录。

```

来自 10.53.0.3 的回复: 字节=32 时间=1ms TTL=59
来自 10.53.0.3 的回复: 字节=32 时间=2ms TTL=59
来自 10.53.0.3 的回复: 字节=32 时间=1ms TTL=59

10.53.0.3 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
往返行程的估计时间(以毫秒为单位):
    最短 = 1ms, 最长 = 2ms, 平均 = 1ms

[c:\~]$_

Connecting to 10.53.0.3:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+]'.

Welcome to Ubuntu 16.04 LTS (GNU/Linux 4.4.0-93-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

197 packages can be updated.
1 update is a security update.

*** System restart required ***
Last login: Thu Dec 14 16:12:39 2017 from 10.133.170.108
gaochenyan@ubuntu:~$ cd /home
gaochenyan@ubuntu:/home$ █

```

再用 `cd sigma` 变换目录。命令 `ll` 和 `ls` 显示该目录下的所有文件和文件夹。蓝色表示文件夹，白色表示文件。

Linux 下通常用颜色来区分文件，默认情况：

蓝色 -> 目录文件

绿色 -> 可执行文件

天蓝色 -> 链接文件

亮黄色 -> 设备文件

闪烁红色 -> 错误的链接文件

白色 -> 一般文件

```

gaochenyan@ubuntu:~$ cd /home
gaochenyan@ubuntu:/home$ cd sigma
gaochenyan@ubuntu:/home/sigma$ cd truck.cn
gaochenyan@ubuntu:/home/sigma/truck.cn$ ll
total 68
drwxrwxr-x 9 sigma sigma 4096 Dec 11 20:33 ./
drwxr-x-- 9 sigma sigma 4096 Dec 18 22:55 ../
drwxrwxr-x 12 sigma sigma 4096 Dec 11 20:33 data/
drwxrwxr-x 2 sigma sigma 4096 Dec 14 12:09 fn/
drwxrwxr-x 8 sigma sigma 4096 Dec 11 20:33 .git/
-rw-rw-r-- 1 sigma sigma 435 Dec 11 20:33 .gitignore
-rw-rw-r-- 1 sigma sigma 8102 Dec 11 20:33 index of truck with Y scaled.csv
-rw-rw-r-- 1 sigma sigma 7089 Dec 11 20:33 index of truck with Y unscale.csv
drwxrwxr-x 2 sigma sigma 4096 Dec 11 20:33 main_branch/
drwxrwxr-x 2 sigma sigma 4096 Dec 11 20:33 main_data_generation/
-rw-rw-r-- 1 sigma sigma 3241 Dec 11 20:33 main.R
drwxrwxr-x 2 sigma sigma 4096 Dec 11 20:33 main_test/
drwxrwxr-x 2 sigma sigma 4096 Dec 11 20:33 pic/
-rw-rw-r-- 1 sigma sigma 2810 Dec 11 20:33 README.md
-rw-rw-r-- 1 sigma sigma 205 Dec 11 20:33 truck.cn.Rproj
gaochenyan@ubuntu:/home/sigma/truck.cn$ ls
data          main_branch  pic
fn            main_data_generation  README.md
index of truck with Y scaled.csv  main.R      truck.cn.Rproj
index of truck with Y unscale.csv main_test
gaochenyan@ubuntu:/home/sigma/truck.cn$

```

cd db_data 进入数据文件夹。命令 ll 显示所有文件。

```

gaochenyan@ubuntu:/home/sigma/truck.cn/data$ cd db_data
gaochenyan@ubuntu:/home/sigma/truck.cn/data/db_data$ ll
total 301680
drwxrwxr-x 2 sigma sigma 4096 Dec 11 20:33 ./
drwxrwxr-x 12 sigma sigma 4096 Dec 11 20:33 ../
-rw-rw-r-- 1 sigma sigma 166827 Dec 11 20:33 biz_Track_15005969403.csv
-rw-rw-r-- 1 sigma sigma 1979126 Dec 11 20:33 biz_Track_64610283798.csv
-rw-rw-r-- 1 sigma sigma 6109425 Dec 11 20:33 biz_Track_64610283799.csv
-rw-rw-r-- 1 sigma sigma 3106018 Dec 11 20:33 biz_Track_64610283800.csv
-rw-rw-r-- 1 sigma sigma 13562975 Dec 11 20:33 biz_Track_64610283801.csv
-rw-rw-r-- 1 sigma sigma 10738416 Dec 11 20:33 biz_Track_64610283802.csv
-rw-rw-r-- 1 sigma sigma 9205300 Dec 11 20:33 biz_Track_64610283803.csv
-rw-rw-r-- 1 sigma sigma 3732685 Dec 11 20:33 biz_Track_64610283804.csv
-rw-rw-r-- 1 sigma sigma 2721570 Dec 11 20:33 biz_Track_64610283805.csv
-rw-rw-r-- 1 sigma sigma 4430062 Dec 11 20:33 biz_Track_64610283806.csv
-rw-rw-r-- 1 sigma sigma 5511997 Dec 11 20:33 biz_Track_64610283807.csv
-rw-rw-r-- 1 sigma sigma 5158056 Dec 11 20:33 biz_Track_64610283808.csv
-rw-rw-r-- 1 sigma sigma 8431020 Dec 11 20:33 biz_Track_64610283809.csv
-rw-rw-r-- 1 sigma sigma 11880715 Dec 11 20:33 biz_Track_64610283810.csv
-rw-rw-r-- 1 sigma sigma 1928231 Dec 11 20:33 biz_Track_64610283811.csv
-rw-rw-r-- 1 sigma sigma 3886837 Dec 11 20:33 biz_Track_64610283812.csv
-rw-rw-r-- 1 sigma sigma 4272561 Dec 11 20:33 biz_Track_64610283813.csv
-rw-rw-r-- 1 sigma sigma 7062489 Dec 11 20:33 biz_Track_64610283814.csv
-rw-rw-r-- 1 sigma sigma 6730566 Dec 11 20:33 biz_Track_64610283815.csv

```

利用命令 more 文件名，查看该文件下的具体数据。

```

gaochenyan@ubuntu:/home/sigma/truck.cn/data/db_data$ more biz_track_64610283895.csv
SimNum,GpsTime,AlarmFlag,StateFlag,ExStateFlag,Longitude,Latitude,Speed,Direction,Mileage
64610283895,2016-09-23 19:53:37.000,0,3,0,119.357615,26.077241,5.0,183,85736.70
64610283895,2016-09-23 19:54:37.000,0,3,0,119.358211,26.076918,7.0,96,85736.80
64610283895,2016-09-23 19:54:43.000,0,3,0,119.358518,26.076903,11.0,97,85736.80
64610283895,2016-09-23 19:55:13.000,0,3,0,119.359598,26.076855,11.0,144,85736.90
64610283895,2016-09-23 19:55:37.000,0,3,0,119.359710,26.076061,11.0,168,85737.00
64610283895,2016-09-23 19:56:37.000,0,3,0,119.360121,26.073926,25.0,169,85737.30
64610283895,2016-09-23 19:58:37.000,0,3,0,119.359870,26.070218,24.0,213,85737.70
64610283895,2016-09-23 20:00:37.000,0,3,0,119.357901,26.068090,14.0,250,85738.00
64610283895,2016-09-23 20:00:47.000,0,3,0,119.357573,26.068186,14.0,297,85738.10
64610283895,2016-09-23 20:01:37.000,0,3,0,119.356040,26.068870,20.0,297,85738.20
64610283895,2016-09-23 20:03:37.000,0,3,0,119.354378,26.069588,7.0,294,85738.40
64610283895,2016-09-23 20:03:49.000,0,3,0,119.353918,26.069708,14.0,249,85738.50
64610283895,2016-09-23 20:03:57.000,0,3,0,119.353690,26.069428,18.0,203,85738.50
64610283895,2016-09-23 20:05:37.000,0,3,0,119.351946,26.066095,20.0,209,85739.00
64610283895,2016-09-23 20:08:00.000,0,3,0,119.350746,26.063485,16.0,162,85739.30
64610283895,2016-09-23 20:08:07.000,0,3,0,119.351071,26.063280,18.0,113,85739.30
64610283895,2016-09-23 20:08:37.000,0,3,0,119.353146,26.062926,25.0,101,85739.50
64610283895,2016-09-23 20:09:37.000,0,3,0,119.357508,26.061211,35.0,116,85740.00
64610283895,2016-09-23 20:10:23.000,0,3,0,119.361165,26.058200,38.0,161,85740.60
64610283895,2016-09-23 20:10:37.000,0,3,0,119.361315,26.056826,37.0,183,85740.70
64610283895,2016-09-23 20:11:38.000,0,3,0,119.362575,26.049535,53.0,151,85741.60

```

输入 R，运行 R。

```

gaochenyan@ubuntu:/home/sigma/truck.cn/data/db_data$ R

R version 3.4.3 (2017-11-30) -- "Kite-Eating Tree"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

```

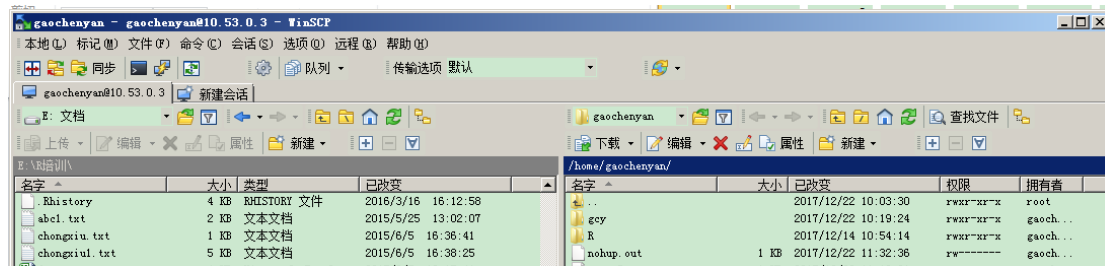
```

> a<-read.csv("biz_Track_64610283895.csv")
> class(a)
[1] "data.frame"
> head(a)
  SimNum      GpsTime AlarmFlag StateFlag ExStateFlag Longitude
1 64610283895 2016-09-23 19:53:37.000      0          3         0 119.3576
2 64610283895 2016-09-23 19:54:37.000      0          3         0 119.3582
3 64610283895 2016-09-23 19:54:43.000      0          3         0 119.3585
4 64610283895 2016-09-23 19:55:13.000      0          3         0 119.3596
5 64610283895 2016-09-23 19:55:37.000      0          3         0 119.3597
6 64610283895 2016-09-23 19:56:37.000      0          3         0 119.3601
  Latitude Speed Direction Mileage
1 26.07724     5       183 85736.7
2 26.07692     7        96 85736.8
3 26.07690    11        97 85736.8
4 26.07685    11       144 85736.9
5 26.07606    11       168 85737.0
6 26.07393    25       169 85737.3

```



2. 本地文件和服务器文件间的传输，利用工具 WinSCP。



3. 建立 R 脚本文件: vi test.R (vi : 新建、编辑脚本文本)

进入编辑窗口。如果遇到不能编辑时，切换输入模式为 insert 的就可以了。编辑结束后，退出编辑窗口：先按 **Esc**，然后输入:wq!回车。

```
gaochenyan@ubuntu:~$ ls
gcy nohup.out R read.R test.R 成绩1.csv 成绩.csv 操作语句.R
gaochenyan@ubuntu:~$ vi sg.R
gaochenyan@ubuntu:~$ ls
gcy nohup.out R read.R sg.R test.R 成绩1.csv 成绩.csv 操作语句.R
gaochenyan@ubuntu:~$
```

4. 运行 R 脚本: Rscript sg.R

```
gaochenyan@ubuntu:~$ Rscript sg.R
[1] "Hello,guy!Merry Christmas!"
gaochenyan@ubuntu:~$
```

5. 在后台运行程序: nohup Rscript R 脚本文件 &

```
gaochenyan@ubuntu:~$ Rscript sg.R
[1] "Hello,guy!Merry Christmas!"
gaochenyan@ubuntu:~$ nohup Rscript sg.R &
[1] 33339
gaochenyan@ubuntu:~$ nohup: ignoring input and appending output to 'nohup.out'

[1]+ Done nohup Rscript sg.R
gaochenyan@ubuntu:~$ cat nohup.out
[1] 2 5 6
NULL
[1] 3
[1] 15
[1] 120
[1] 1
[1] 5
[1] 2.5
[1] 1.581139
[1] 1 4 9
[1] 11
[1] 6
[1] 8
```

图中的 33339 是这程序运行的进程号。程序运行的结果被默认追加输入在 nohup.out 文件中。利用命令 cat 查看文件内容。

6. 杀死 Kill -9 进程号


```
gaochenyan@ubuntu:~$ ls
gcy nohup.out R read.R sg.R test.R 成绩1.csv 成绩.csv 操作语句.R
gaochenyan@ubuntu:~$ nohup Rscript 操作语句.R &
[1] 36678
gaochenyan@ubuntu:~$ nohup: ignoring input and appending output to 'nohup.out'
kill -9 36678
```

7. 后台定期执行程序 crontab -e

启动 anno 编辑器。命令格式：分 时 日 月 星期 要运行的命令

```
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h dom mon dow  command
* * * * * nohup Rscript print_time.R >> /home/sigma/log
```

那五个*表示一分钟执行一次。双箭头后面是结果输入的文件路径和文件名。那前5列可以设置如下：* * 1 * * 表示1天执行一次。

第1列分钟1~59

第2列小时1~23（0表示子夜）

第3列日1~31

第4列月1~12

第5列星期0~6（0表示星期天）

第6列要运行的命令

编辑完后，退出 ctrl +X，是否保存：y，然后再出界面，点回车。返回 shell 界面。

```
sigma@ubuntu:~$ crontab -e
crontab: installing new crontab
```

```
sigma@ubuntu:~$ cat log
[1] "2017-12-22 13:22:01 CST"
[1] "2017-12-22 13:23:01 CST"
[1] "2017-12-22 13:24:01 CST"
[1] "2017-12-25 10:48:01 CST"
sigma@ubuntu:~$ cat log
[1] "2017-12-22 13:22:01 CST"
[1] "2017-12-22 13:23:01 CST"
[1] "2017-12-22 13:24:01 CST"
[1] "2017-12-25 10:48:01 CST"
[1] "2017-12-25 10:49:01 CST"
```

查看进程：top 第一列表示进程号。

```
sigma@ubuntu:~$ top
top - 11:09:18 up 100 days, 16:51, 4 users, load average: 0.00, 0.00, 0.00
Tasks: 443 total, 1 running, 441 sleeping, 1 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 32894896 total, 25100156 free, 443000 used, 7351740 buff/cache
KiB Swap: 33506300 total, 33506300 free, 0 used. 31894344 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 37783 sigma      20   0   42068   4040   3116 R   2.3   0.0   0:00.31 top
 37639 root        20   0     0     0     0  S   1.1   0.0   0:00.06 kworker/u97:1
    1 root        20   0   38404   6536   4052 S   0.0   0.0   1:04.12 systemd
    2 root        20   0     0     0     0  S   0.0   0.0   0:00.49 kthreadd
    3 root        20   0     0     0     0  S   0.0   0.0   0:00.12 ksoftirqd/0
    5 root         0 -20     0     0     0  S   0.0   0.0   0:00.00 kworker/0:0H
    6 root        20   0     0     0     0  S   0.0   0.0   1:21.64 kworker/u96:0
    8 root        20   0     0     0     0  S   0.0   0.0   3:41.27 rcu_sched
    9 root        20   0     0     0     0  S   0.0   0.0   0:00.00 rcu_bh
   10 root        rt    0     0     0     0  S   0.0   0.0   0:00.22 migration/0
   11 root        rt    0     0     0     0  S   0.0   0.0   0:27.21 watchdog/0
```

8. 杀死该定期执行程序

crontab -l 列出正在定期运行的程序。crontab -r 终止该程序。

```
[1] "2017-12-25 11:13:01 CST"
sigma@ubuntu:~$ crontab -l
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h dom mon dow  command
* * * * * nohup Rscript print_time.R >> /home/sigma/log
sigma@ubuntu:~$ crontab -r
sigma@ubuntu:~$ crontab -l
no crontab for sigma
```


9. 修改文件夹的访问权限。

利用命令 ll 查看该目录下的文件夹和文件。

```
total 56
drwx----- 10 test test 4096 Dec 22 10:10 ./
drwxr-xr-x 11 root root 4096 Dec 22 10:03 ../
-rw----- 1 test test 61 Dec 22 10:37 .bash_history
-rw-r--r-- 1 test test 220 Dec 22 10:03 .bash_logout
-rw-r--r-- 1 test test 3771 Dec 22 10:03 .bashrc
drwx----- 2 test test 4096 Dec 22 10:05 .cache/
drwxr-xr-x 2 root root 4096 Dec 22 10:06 chengqian/
drwxr-xr-x 2 root root 4096 Dec 22 10:07 luzhijuan/
-rw-r--r-- 1 test test 655 Dec 22 10:03 .profile
drwxr-xr-x 2 root root 4096 Dec 22 10:07 wujun/
drwxr-xr-x 2 root root 4096 Dec 22 10:06 wurui/
drwxr-xr-x 2 root root 4096 Dec 22 10:06 yangwei/
drwxr-xr-x 2 root root 4096 Dec 22 10:06 zhangshengnan/
drwxr-xr-x 2 root root 4096 Dec 22 10:06 zhongchongli/
test@ubuntu:~$
```

第一列是表示权限：共 10 列。第一个字符是 d 表示文档，剩下的九个字符分别表示：本机的权限（1-3），同组的权限（4-6），他人的权限（7-9）。R 可读，w 可写，x 可执行。

比如 chengqian 这个文件夹的权限是：对本人的权限是可读可写可执行，对同组和不同组的权限是可读可执行不可写。

接下来修改 gaochenyan 文件夹的权限为：对本人的权限是可读可写可执行，对同组和不同组的权限是可读可执行不可写。使用命令：sudo chmod 755 gaochenyan。

（权限的编码是：可执行——1，可写——2，可读——4。例如 751 就表示：对本人是可读可写可执行，对同组是可读可执行，对他人是可执行。）

```
drwx----- 4 changxiangyu sigma 4096 Dec 11 20:44 changxiangyu/
drwx----- 6 gaochenyan sigma 4096 Dec 25 09:31 gaochenyan/
drwx----- 5 shenjingzhou sigma 4096 Dec 15 11:43 shenjingzhou/
drwxrwxrwx 2 shiny shiny 4096 Dec 18 23:32 shiny/
drwxr-x--- 9 sigma sigma 4096 Dec 22 13:22 sigma/
drwx----- 10 test test 4096 Dec 22 15:03 test/
drwx----- 4 zhang zhang 4096 Dec 11 17:10 zhang/
drwx----- 6 zhangjunli sigma 4096 Dec 22 13:01 zhangjunli/
drwxr-x--- 2 zhangrui zhangrui 4096 Dec 22 12:46 zhangrui/
drwx----- 4 zhudejun sigma 4096 Dec 22 15:04 zhudejun/
sigma@ubuntu:/home$ sudo chmod 755 gaochenyan
sigma@ubuntu:/home$ ll
total 48
drwxr-xr-x 12 root root 4096 Dec 22 12:46 ./
drwxr-xr-x 23 root root 4096 Dec 16 04:26 ../
drwx----- 4 changxiangyu sigma 4096 Dec 11 20:44 changxiangyu/
drwxr-xr-x 6 gaochenyan sigma 4096 Dec 25 09:31 gaochenyan/
drwx----- 5 shenjingzhou sigma 4096 Dec 15 11:43 shenjingzhou/
drwxrwxrwx 2 shiny shiny 4096 Dec 18 23:32 shiny/
drwxr-x--- 9 sigma sigma 4096 Dec 22 13:22 sigma/
drwx----- 10 test test 4096 Dec 22 15:03 test/
drwx----- 4 zhang zhang 4096 Dec 11 17:10 zhang/
drwx----- 6 zhangjunli sigma 4096 Dec 22 13:01 zhangjunli/
drwxr-x--- 2 zhangrui zhangrui 4096 Dec 22 12:46 zhangrui/
drwx----- 4 zhudejun sigma 4096 Dec 22 15:04 zhudejun/
sigma@ubuntu:/home$
```

注意：只有主用户才能修改权限。