1. 登录 Linux 系统：

- 学员练习系统：账号密码参考入学须知贴。

```
[chenjing@chenjings-MBP ~ % ssh ck270857@shell.ceshiren.com
[ck270857@shell.ceshiren.com's password:
Last login: Sun Aug  6 19:18:20 2023 from 101.224.47.37

Welcome to Hogwarts Shell Server!

此服务器仅用作学员Shell练习使用，请各位同学不要上传大于100MB的单个文件。服务器会每日定期检查大于100MB的文件，然后删除！

-bash: warning: setlocale: LC_CTYPE: cannot change locale (UTF-8): No such file or directory
[ck270857@shell.ceshiren.com ~]$ 
```

2. 完成以下操作

- a. 创建新目录。
- b. 切换到新目录下。
- c. 创建新文件，在新文件中添加内容。
- d. 查看新文件中的内容。
- e. 修改新文件权限为可读、可写、可执行。
- f. 查看当前目录。

```
[ck270857@shell.ceshiren.com ~]$ mkdir homework
[ck270857@shell.ceshiren.com ~]$ cd homework/
[ck270857@shell.ceshiren.com homework]$ touch test.txt
[ck270857@shell.ceshiren.com homework]$ vim test.txt
[ck270857@shell.ceshiren.com homework]$ cat test.txt
Hello world!
Python
Java
First demo
[ck270857@shell.ceshiren.com homework]$ ll
total 4
-rw-rw-r-- 1 ck270857 ck270857 36 Aug  6 19:35 test.txt
[ck270857@shell.ceshiren.com homework]$ chmod 444 test.txt
[ck270857@shell.ceshiren.com homework]$ ll
total 4
-r--r--r-- 1 ck270857 ck270857 36 Aug  6 19:35 test.txt
[ck270857@shell.ceshiren.com homework]$ chmod 222 test.txt
[ck270857@shell.ceshiren.com homework]$ ll
total 4
--w--w--w- 1 ck270857 ck270857 36 Aug  6 19:35 test.txt
[ck270857@shell.ceshiren.com homework]$ chmod 111 test.txt
[ck270857@shell.ceshiren.com homework]$ ll
total 4
---x--x--x 1 ck270857 ck270857 36 Aug  6 19:35 test.txt
[ck270857@shell.ceshiren.com homework]$ chmod 777 test.txt
[ck270857@shell.ceshiren.com homework]$ ll
total 4
-rwxrwxrwx 1 ck270857 ck270857 36 Aug  6 19:35 test.txt
[ck270857@shell.ceshiren.com homework]$ 
```

3. 查询 Linux 系统负载与进程。

- 系统负载

```
top - 19:38:22 up 1011 days,  8:20,  3 users,  load average: 0.00, 0.02, 0.05
Tasks: 120 total,   1 running, 117 sleeping,   1 stopped,   1 zombie
%Cpu(s):  0.3 us,  0.3 sy,  0.0 ni, 99.3 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem : 3881920 total,  171716 free,  964792 used, 2745412 buff/cache
KiB Swap:       0 total,       0 free,       0 used.  541592 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
32102 root      10 -10  152520  28240   3872 S   2.0  0.7 478:39.02 AliYunDunMonito
 7882 jy44865   20   0  166100   5588    584 S   0.3  0.1 740:09.57 top
32092 root      10 -10  101552   4436   2076 S   0.3  0.1  73:12.16 AliYunDun
    1 root      20   0   52052   3252   1516 S   0.0  0.1 720:53.60 systemd
    2 root      20   0       0      0      0 S   0.0  0.0   0:13.66 kthreadd
    3 root      20   0       0      0      0 S   0.0  0.0 332:03.68 ksoftirqd/0
    5 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kworker/0:0H
    7 root      rt   0       0      0      0 S   0.0  0.0   6:31.23 migration/0
    8 root      20   0       0      0      0 S   0.0  0.0   0:00.00 rcu_bh
    9 root      20   0       0      0      0 S   0.0  0.0 351:58.12 rcu_sched
   12 root      rt   0       0      0      0 S   0.0  0.0   6:33.91 migration/1
   13 root      20   0       0      0      0 S   0.0  0.0 333:49.04 ksoftirqd/1
   15 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kworker/1:0H
   17 root      20   0       0      0      0 S   0.0  0.0   0:00.00 kdevtmpfs
   18 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 netns
   19 root      20   0       0      0      0 S   0.0  0.0   0:29.51 khungtaskd
   20 root       0 -20       0      0      0 S   0.0  0.0   0:00.05 writeback
   21 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kintegrityd
   22 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 bioset
   23 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kblockd
   24 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 md
   31 root      20   0       0      0      0 S   0.0  0.0 140:19.78 kswapd0
   32 root      25   5       0      0      0 S   0.0  0.0   0:00.00 ksmd
   33 root      39  19       0      0      0 S   0.0  0.0  13:07.84 khugepaged
   34 root      20   0       0      0      0 S   0.0  0.0   0:01.64 fsnotify_mark
   35 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 crypto
   43 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kthrotld
   45 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kmpath_rdacd
   46 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kpsmoused
   47 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 ipv6_addrconf
   66 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 deferwq
   99 root      20   0       0      0      0 S   0.0  0.0   0:00.00 kauditd
  224 root       0 -20       0      0      0 S   0.0  0.0   0:00.11 ata_sff
  227 root      20   0       0      0      0 S   0.0  0.0   0:00.00 scsi_eh_0
  229 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 scsi_tmf_0
  230 root      20   0       0      0      0 S   0.0  0.0   0:00.00 scsi_eh_1
  232 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 scsi_tmf_1
  246 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 ttm_swap
  260 root       0 -20       0      0      0 S   0.0  0.0   6:08.01 kworker/0:1H
```

- 进程信息

```
[ps au -m
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root       489  0.0  0.0 110032   124 tty1     -     2020   0:00 /sbin/agetty --noclear tty1 linux
root         -  0.0    -      -     - -        Ss+   2020   0:00 -
quanjin+ 10333  0.0  0.0 115504   388 pts/5    -     2021   0:00 -bash
quanjin+     -  0.0    -      -     - -        Ss    2021   0:00 -
quanjin+ 10360  0.0  0.0 161768   640 pts/5    -     2021   0:06 top
quanjin+     -  0.0    -      -     - -        S+    2021   0:06 -
ck277204 16526  0.0  0.0 115748  2044 pts/0    -    17:53   0:00 -bash
ck277204     -  0.0    -      -     - -        Ss+  17:53   0:00 -
ck270857 26679  0.0  0.0 115664  2144 pts/8    -    19:42   0:00 -bash
ck270857     -  0.0    -      -     - -        Ss   19:42   0:00 -
ck270857 26729  0.0  0.2 291744  8588 pts/8    -    19:42   0:00 python multithreaddemo.py 2 2
ck270857     -  0.0    -      -     - -        Tl   19:42   0:00 -
ck270857     -  0.0    -      -     - -        Tl   19:42   0:00 -
ck270857     -  0.0    -      -     - -        Tl   19:42   0:00 -
ck270857 26731  0.0  0.1 144276  6520 pts/8    -    19:42   0:00 python multithreaddemo.py 2 2
ck270857     -  0.0    -      -     - -        T    19:42   0:00 -
ck270857 26733  0.0  0.1 144276  6484 pts/8    -    19:42   0:00 python multithreaddemo.py 2 2
ck270857     -  0.0    -      -     - -        T    19:42   0:00 -
ck270857 26797  0.0  0.0 155420  1792 pts/8    -    19:43   0:00 ps au -m
ck270857     -  0.0    -      -     - -        R+   19:43   0:00 -

[1]+  Stopped                 python multithreaddemo.py 2 2
[ck270857@shell.ceshiren.com test]$ ps -eo uname,pid,ppid,psr,thcount,tid,pcpu,pmem,stat,cmd|grep python
root     17064     1   0    5   17064  0.0  0.2 Ssl  /usr/bin/python2 -Es /usr/sbin/tuned -l -P
ck270857 26729 26679   0    3   26729  0.0  0.2 Tl   python multithreaddemo.py 2 2
ck270857 26731 26729   0    1   26731  0.0  0.1 T    python multithreaddemo.py 2 2
ck270857 26733 26729   1    1   26733  0.0  0.1 T    python multithreaddemo.py 2 2
ck270857 26825 26679   0    1   26825  0.0  0.0 S+   grep --color=auto python
[ck270857@shell.ceshiren.com test]$
```

4. 查询 Linux 系统内存使用数据并保存到文件中。

```
[[ck270857@shell.ceshiren.com test]$ free
              total        used        free      shared  buff/cache   available
Mem:        3881920      973604      115508     2131252     2792808      532752
Swap:             0           0           0
[[ck270857@shell.ceshiren.com test]$ free > mem.txt
[[ck270857@shell.ceshiren.com test]$ cat mem.txt
              total        used        free      shared  buff/cache   available
Mem:        3881920      974068      115012     2131252     2792840      532296
Swap:             0           0           0
[ck270857@shell.ceshiren.com test]$
```

5. 统计内存数据文件的字节数。

```
[[ck270857@shell.ceshiren.com test]$ cat wc_demo.txt
Hello!
hello world
python
java
xxx
[[ck270857@shell.ceshiren.com test]$ cat wc_demo.txt |wc
      5       6      35
[ck270857@shell.ceshiren.com test]$
```

6. 对内存数据文件的每一行按 ASCII 码值降序排列并去重。

```
[[ck270857@shell.ceshiren.com test]$ cat sort_n.txt
0
123
134123
434
3442
234
56456
jjj
667
907
3442
[[ck270857@shell.ceshiren.com test]$ cat sort_n.txt |sort -r|uniq > sort_and_unique.txt
[[ck270857@shell.ceshiren.com test]$ cat sort_and_unique.txt
jjj
907
667
56456
434
3442
234
134123
123
0
[ck270857@shell.ceshiren.com test]$
```

7. 查询 Linux 系统进程列表快照。

```
[ck270857@shell.ceshiren.com test]$ ps aux
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.0  52052  3252 ?        Ss    2020 720:53 /usr/lib/systemd/systemd --system --deserialize 21
root         2  0.0  0.0      0     0 ?        S     2020   0:13 [kthreadd]
root         3  0.0  0.0      0     0 ?        S     2020 332:03 [ksoftirqd/0]
root         5  0.0  0.0      0     0 ?        S<    2020   0:00 [kworker/0:0H]
root         7  0.0  0.0      0     0 ?        S     2020   6:31 [migration/0]
root         8  0.0  0.0      0     0 ?        S     2020   0:00 [rcu_bh]
root         9  0.0  0.0      0     0 ?        S     2020 351:58 [rcu_sched]
root        12  0.0  0.0      0     0 ?        S     2020   6:33 [migration/1]
root        13  0.0  0.0      0     0 ?        S     2020 333:49 [ksoftirqd/1]
root        15  0.0  0.0      0     0 ?        S<    2020   0:00 [kworker/1:0H]
root        17  0.0  0.0      0     0 ?        S     2020   0:00 [kdevtmpfs]
root        18  0.0  0.0      0     0 ?        S<    2020   0:00 [netns]
root        19  0.0  0.0      0     0 ?        S     2020   0:29 [khungtaskd]
root        20  0.0  0.0      0     0 ?        S<    2020   0:00 [writeback]
root        21  0.0  0.0      0     0 ?        S<    2020   0:00 [kintegrityd]
root        22  0.0  0.0      0     0 ?        S<    2020   0:00 [bioset]
root        23  0.0  0.0      0     0 ?        S<    2020   0:00 [kblockd]
root        24  0.0  0.0      0     0 ?        S<    2020   0:00 [md]
root        31  0.0  0.0      0     0 ?        S     2020 140:19 [kswapd0]
root        32  0.0  0.0      0     0 ?        SN    2020   0:00 [ksmd]
root        33  0.0  0.0      0     0 ?        SN    2020  13:07 [khugepaged]
root        34  0.0  0.0      0     0 ?        S     2020   0:01 [fsnotify_mark]
root        35  0.0  0.0      0     0 ?        S<    2020   0:00 [crypto]
root        43  0.0  0.0      0     0 ?        S<    2020   0:00 [kthrotld]
root        45  0.0  0.0      0     0 ?        S<    2020   0:00 [kmpath_rdacd]
root        46  0.0  0.0      0     0 ?        S<    2020   0:00 [kpsmoused]
root        47  0.0  0.0      0     0 ?        S<    2020   0:00 [ipv6_addrconf]
root        66  0.0  0.0      0     0 ?        S<    2020   0:00 [deferwq]
root        99  0.0  0.0      0     0 ?        S     2020   0:00 [kauditd]
root       224  0.0  0.0      0     0 ?        S<    2020   0:00 [ata_sff]
root       227  0.0  0.0      0     0 ?        S     2020   0:00 [scsi_eh_0]
root       229  0.0  0.0      0     0 ?        S<    2020   0:00 [scsi_tmf_0]
root       230  0.0  0.0      0     0 ?        S     2020   0:00 [scsi_eh_1]
root       232  0.0  0.0      0     0 ?        S<    2020   0:00 [scsi_tmf_1]
root       246  0.0  0.0      0     0 ?        S<    2020   0:00 [ttm_swap]
root       260  0.0  0.0      0     0 ?        S<    2020   6:08 [kworker/0:1H]
root       266  0.0  0.0      0     0 ?        S<    2020  20:32 [kworker/1:1H]
root       271  0.0  0.0      0     0 ?        S     2020  55:50 [jbd2/vda1-8]
root       272  0.0  0.0      0     0 ?        S<    2020   0:00 [ext4-rsv-conver]
```