实验 01 Linux 入门

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一、实验目的
1．练习简单命令用法

二、实验要求
1．填写实验报告，请将关键命令及其结果进行截图(请确保截图中的文字清晰可见)
2．导出为 pdf 文件，文件名为用户名-姓名-lab01.pdf，在规定截止时间之前上传作业）

二、实验步骤
1 .练习使用基本命令
（1）请用普通用户和 root 用户身份分别在 3 个本地虚拟字符终端、2 个网络虚拟终端上登录系统，并列出所有登录情况

```
Ubuntu 20.04.5 LTS s13-virtual-machine tty3

s13-virtual-machine login: root
Password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

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or proxy settings

Your Hardware Enablement Stack (HWE) is supported until April 2025.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@s13-virtual-machine:~# tty
/dev/tty3
root@s13-virtual-machine:~#
```

```
Ubuntu 20.04.5 LTS s13-virtual-machine tty4

s13-virtual-machine login: s13
Password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

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Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Mon Sep  5 07:01:02 CST 2022 on tty3
s13@s13-virtual-machine:~$ tty
/dev/tty4
s13@s13-virtual-machine:~$ _
```

```
Ubuntu 20.04.5 LTS s13-virtual-machine tty4

s13-virtual-machine login: root
Password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
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Last login: Mon Sep  5 15:54:28 CST 2022 on tty3
root@s13-virtual-machine:~# tty
/dev/tty4
root@s13-virtual-machine:~#
```

```
Ubuntu 20.04.5 LTS s13-virtual-machine tty5

s13-virtual-machine login: s13
Password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

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 or proxy settings

 Your Hardware Enablement Stack (HWE) is supported until April 2025.
 Last login: Mon Sep  5 07:02:00 CST 2022 on tty4
 s13@s13-virtual-machine:~$ tty
 /dev/tty5
 s13@s13-virtual-machine:~$ _
```

```
Ubuntu 20.04.5 LTS s13-virtual-machine tty5

s13-virtual-machine login: root
Password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

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 or proxy settings

 Your Hardware Enablement Stack (HWE) is supported until April 2025.
 Last login: Mon Sep  5 15:58:47 CST 2022 on tty4
 root@s13-virtual-machine:~# tty
 /dev/tty5
 root@s13-virtual-machine:~# _
```

```
    • X11-forwarding  :  ✓  (remote display is forwarded through SSH)

    ▸ For more info, ctrl+click on help or visit our website.


Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

2 更新可以立即应用。
这些更新中有 1 个是标准安全更新。
要查看这些附加更新，请运行: apt list --upgradable

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Internet connection or proxy settings

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Mon Sep  5 07:02:24 2022
/usr/bin/xauth:  file /home/s13/.Xauthority does not exist
s13@s13-virtual-machine:~$ tty
/dev/pts/2
s13@s13-virtual-machine:~$
```

```
root@192.168.18.128's password:

                    • MobaXterm Personal Edition v22.1 •
                  (SSH client, X server and network tools)

    ► SSH session to root@192.168.18.128
      • Direct SSH       :  ✔
      • SSH compression  :  ✔
      • SSH-browser      :  ✔
      • X11-forwarding   :  ✔  (remote display is forwarded through SSH)

    ► For more info, ctrl+click on help or visit our website.


Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
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Internet connection or proxy settings

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Mon Sep  5 16:00:45 2022
/usr/bin/xauth:  file /root/.Xauthority does not exist
root@s13-virtual-machine:~# tty
/dev/pts/0
root@s13-virtual-machine:~#
```



```
Xshell 7 (Build 0111)
Copyright (c) 2020 NetSarang Computer, Inc. All rights reserved.

Type `help' to learn how to use Xshell prompt.
[C:\~]$

Connecting to 192.168.18.128:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+]'.

Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

0 更新可以立即应用。

Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Mon Sep  5 15:51:20 2022 from 192.168.18.1
s13@s13-virtual-machine:~$ tty
/dev/pts/0
s13@s13-virtual-machine:~$
```

（2）以普通用户身份运行命令 `fdisk -l`，切换为 root 用户身份后再次运行该命令，查看该命令的帮助，然后再切换回普通用户身份。

```
s13@s13-virtual-machine:~$ su root
密码：
root@s13-virtual-machine:/home/s13# fdisk -l
Disk /dev/loop0: 4 KiB, 4096 字节, 8 个扇区
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节


Disk /dev/loop1: 61.98 MiB, 64966656 字节, 126888 个扇区
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节


Disk /dev/loop2: 346.3 MiB, 363118592 字节, 709216 个扇区
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节


Disk /dev/loop3: 91.7 MiB, 96141312 字节, 187776 个扇区
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节


Disk /dev/loop4: 54.24 MiB, 56872960 字节, 111080 个扇区
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节


Disk /dev/loop5: 46.98 MiB, 49242112 字节, 96176 个扇区
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
I/O 大小(最小/最佳): 512 字节 / 512 字节


Disk /dev/sda: 20 GiB, 21474836480 字节, 41943040 个扇区
Disk model: VMware Virtual S
单元: 扇区 / 1 * 512 = 512 字节
扇区大小(逻辑/物理): 512 字节 / 512 字节
```

```
root@s13-virtual-machine:/home/s13# fdisk -l -help

用法：
 fdisk [选项] <磁盘>          更改分区表
 fdisk [选项] -l [<磁盘>]     列出分区表

显示或操作磁盘分区表。
```

（3）通过一条命令行打印操作系统的内核版本号和主机名（但不能打印出其他信息）

```
root@s13-virtual-machine:/home/s13# uname -n -r
s13-virtual-machine 5.15.0-46-generic
```

（4）请用 date 命令打印 2021 年国庆节是 2021 年第几周的星期几

(要求输出格式为：Wednesday of week 17)

```
date -d "2021-10-01" +%A
s13@s13-virtual-machine:~$ day=`date -d "2021-10-01" +%A`
s13@s13-virtual-machine:~$ echo $day
星期五
s13@s13-virtual-machine:~$ week=` date --date "2021-10-01" +%V`
s13@s13-virtual-machine:~$ echo $day of $week
星期五 of 39
s13@s13-virtual-machine:~$
```
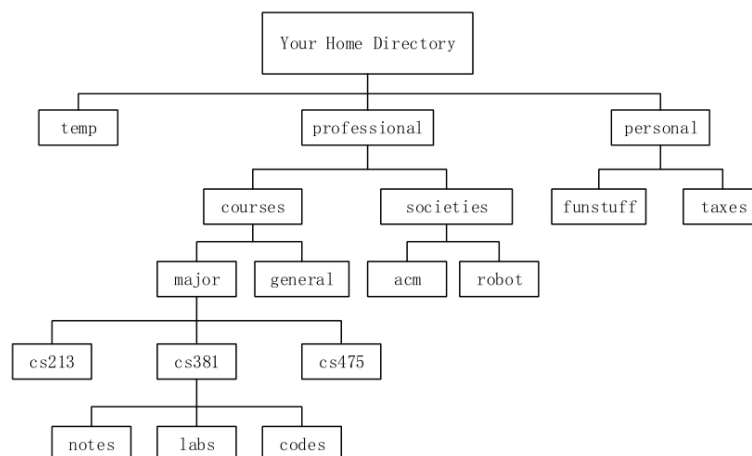
（5）请用 cal 命令一次性打印 5、6、7 三个月的月历，且每周从星期一开始算起

```
[s13@iZuf6ixnt8107e8ns3k4tuZ root]$ cal -m 5 2022 && cal -m 6 2022 && cal -m 7 2022
      May 2022
Mo Tu We Th Fr Sa Su
                    1
 2  3  4  5  6  7  8
 9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
     June 2022
Mo Tu We Th Fr Sa Su
       1  2  3  4  5
 6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30
     July 2022
Mo Tu We Th Fr Sa Su
             1  2  3
 4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
```

（6）请用 bc 命令计算方程 $4x^2+7x+2=0$ 的根

```
[s13@iZuf6ixnt8107e8ns3k4tuZ root]$ bc
bc 1.06.95
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006 Free Software Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type `warranty'.
scale=4
;
(-7+sqrt(7*7-4*4*2))/2*4
-5.7536
(-7-sqrt(7*7-4*4*2))/2*4
-22.2460
```

2. 在你的主目录建立如下图所示的目录结构：

3. 执行 cd professional/courses 命令，回答下列问题：

1）你的主目录的绝对路径是什么？

2）acm 目录的绝对路径是什么？

/home/s13/professional/societies/acm

3）给出 amc 目录的三个不同的相对路径。

```
s13@s13-virtual-machine:~/professional/courses$ cd ../societies/acm
s13@s13-virtual-machine:~/professional/societies/acm$
```

```
s13@s13-virtual-machine:~/professional/courses$ cd ../../professional/societies/
acm
s13@s13-virtual-machine:~/professional/societies/acm$
```

4）执行 cd major/cs381/labs 命令。然后执行一个命令显示当前目录的绝对路径。

```
s13@s13-virtual-machine:~/professional/courses$ cd major/cs381/labs
s13@s13-virtual-machine:~/professional/courses/major/cs381/labs$ pwd
/home/s13/professional/courses/major/cs381/labs
s13@s13-virtual-machine:~/professional/courses/major/cs381/labs$
```

5）给出打印你的主目录的三条不同的命令及其输出。

```
/home/s13/professional/courses/major/cs381/labs
s13@s13-virtual-machine:~/professional/courses/major/cs381/labs$ cd ~s13
s13@s13-virtual-machine:~$ pwd
/home/s13
```

```
s13@s13-virtual-machine:~/professional/courses/major/cs381/labs$ cd ~
s13@s13-virtual-machine:~$ pwd
/home/s13
```

```
s13@s13-virtual-machine:~/professional/courses/major/cs381/labs$ cd
s13@s13-virtual-machine:~$ pwd
/home/s13
```

4．练习使用 ed 编辑器：

1）创建文件 s01-cs381-lab01.txt，内容如下：

Hello, my username is s01.

I am learning linux.

This is my first file.

```
s13@s13-virtual-machine:~$ ed
a
Hello,my username is s01.
I am learning linux.
This is my first file.
.
w s01-cs381-lab01.txt
70
q
```

2）用 ed 编辑器再次打开 s01-cs381-lab01.txt，完成以下操作：

(1) 在第 2 行前插入一行：

My name is XXX（请填写中文姓名）

```
This is my first file.
s13@s13-virtual-machine:~$ ed s01-cs381-lab01.txt
70
2
I am learning linux.
i
My name is zhanghua.
.
wq
91
s13@s13-virtual-machine:~$ cat s01-cs381-lab01.txt
Hello,my username is s01.
My name is zhanghua.
I am learning linux.
This is my first file.
```

(2) 将原来的第 3 行改为：

My student ID is xxxxxxxxxx（请填写自己的学号）

```
This is my first file.
s13@s13-virtual-machine:~$ ed s01-cs381-lab01.txt
91
c
My student id is 202026203005.
.
wq
99
s13@s13-virtual-machine:~$ cat s01-cs381-lab01.txt
Hello,my username is s01.
My name is zhanghua.
I am learning linux.
My student id is 202026203005.
s13@s13-virtual-machine:~$
```

(3) 删除原来的第 2 行

```
My student id is 202026203005.
s13@s13-virtual-machine:~$ ed s01-cs381-lab01.txt
99
3d
wq
78
s13@s13-virtual-machine:~$ cat s01-cs381-lab01.txt
Hello,my username is s01.
My name is zhanghua.
My student id is 202026203005.
```

5．用 cat 查看 s01-cs381-lab01.txt 的内容（要求打印出行号）

```
s13@s13-virtual-machine:~$ cat s01-cs381-lab01.txt -b
     1  Hello,my username is s01.
     2  My name is zhanghua.
     3  My student id is 202026203005.
s13@s13-virtual-machine:~$
```