

# 四川大学计算机学院、软件学院

## 实验报告

学号：\_\_\_\_\_ 姓名：\_\_\_\_\_ 专业：软件工程 班级：05 第一周

课程名称	操作系统课程设计	实验课时	6
实验项目	Linux 基础与命令实践	实验时间	2023/9/10
实验目的	1) 概念：虚拟机系统和 VMWare 2) 概念：Unix 操作系统和 Linux 操作系统 3) 了解/DIY：VMWare 的安装和 Linux（如 RedHat 等发布版）的安装 4) 演示/实践：Linux 的启动和界面：CUI 和 GUI（在 VMWare 下） 5) 演示/实践：Linux 基本命令的使用：如文件/网络等命令 6) 概念：Linux 的文件系统的基本结构		
实验环境	ARM64, MacOS, Parallels Desktop 19, Ubuntu Linux 22.04.2		

实验内容

ls	显示目录中文件
pwd	显示当前目录
cd	改变工作目录
mkdir	新建目录（-p 一并建立未建立的上层目录）
rmdir	删除空目录
cp	拷贝文件到指定目录
mv	移动文件到指定目录
rm	删除文件及目录（-rf 强制删除）
find	检索文件
cat	显示文件内容
more	浏览文件内容
head	显示文件开头若干行
tail	显示文件末尾若干行
...	...

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Libvirt 22.04.2 ARMv8
Activities Terminal
parallels@MyHueyyvYMBP:~$ ls
Desktop Documents Downloads Music Pictures Videos clash snap
parallels@MyHueyyvYMBP:~$ ls -la
total 40
drwxr-xr-x 3 parallels parallels 4096 Sep 10 16:19 .
drwxr-xr-x 3 parallels parallels 4096 Sep 10 16:19 ..
-rw-r--r-- 1 parallels parallels 220 Jan 7 2022 .bash_logout
-rw-r--r-- 1 parallels parallels 3771 Jan 7 2022 .bashrc
-rw-r--r-- 1 parallels parallels 4096 Sep 10 14:56 .cache
-rw-r--r-- 1 parallels parallels 4096 Sep 10 15:53 .config
-rw-r--r-- 1 parallels parallels 4096 Sep 10 15:55 .gnupg
-rw-r--r-- 1 parallels parallels 4096 Sep 10 14:18 .local
-rw-r--r-- 1 parallels parallels 4096 Sep 10 14:27 .mozilla
-rw-r--r-- 1 parallels parallels 306 Sep 10 14:26 .pam_environment
-rw-r--r-- 1 parallels parallels 4096 Sep 7 11:23 .parallels
-rw-r--r-- 1 parallels parallels 4096 Sep 10 13:03 .profile
-rw-r--r-- 1 parallels parallels 807 Jan 7 2022 .ssh
-rw-r--r-- 1 parallels parallels 4096 Sep 10 15:55 .sudo_as_admin_successful
-rw-r--r-- 4 parallels parallels 4096 Sep 10 14:27 .thunderbird
-rw-r--r-- 3 parallels parallels 11786 Sep 10 12:27 .vim
-rw-r--r-- 1 parallels parallels 11786 Sep 10 14:56 .viminfo
-rw-r--r-- 1 parallels parallels 3897 Sep 10 13:34 .vmrc
-rw-r--r-- 1 parallels parallels 11786 Sep 10 14:27 .wget-hsts
parallels@MyHueyyvYMBP:~$ ls -l
total 40
drwxr-xr-x 2 parallels parallels 4096 Sep 7 11:37 Desktop
drwxr-xr-x 2 parallels parallels 4096 Sep 10 12:59 Documents
drwxr-xr-x 4 parallels parallels 4096 Sep 10 16:19 Downloads
drwxr-xr-x 2 parallels parallels 4096 Sep 3 21:45 Music
drwxr-xr-x 2 parallels parallels 4096 Sep 3 21:45 Pictures
drwxr-xr-x 2 parallels parallels 4096 Sep 3 21:45 Public
drwxr-xr-x 2 parallels parallels 4096 Sep 3 21:45 Templates
drwxr-xr-x 2 parallels parallels 4096 Sep 3 21:45 Videos
drwxr-xr-x 4 parallels parallels 4096 Jan 1 1970 clash
drwx----- 3 parallels parallels 4096 Sep 10 13:07 snap
parallels@MyHueyyvYMBP:~$ ls -la
total 132
drwxr-xr-x 22 parallels parallels 4096 Sep 10 14:56 .
drwxr-xr-x 3 root root 4096 Sep 10 15:53 ..
-rw-r--r-- 1 parallels parallels 4766 Sep 10 16:18 .bash_history
-rw-r--r-- 1 parallels parallels 220 Jan 7 2022 .bash_logout
-rw-r--r-- 1 parallels parallels 3771 Jan 7 2022 .bashrc
drwx----- 18 parallels parallels 4096 Sep 10 14:27 .cache
drwx----- 20 parallels parallels 4096 Sep 10 15:55 .config
drwx----- 2 parallels parallels 4096 Sep 10 14:18 .gnupg
drwx----- 3 parallels parallels 4096 Jun 29 22:33 .local
drwx----- 3 parallels parallels 4096 Sep 10 14:27 .mozilla
-rw-r--r-- 1 parallels parallels 306 Sep 10 14:26 .pam_environment
drwxr-xr-x 2 parallels parallels 4096 Sep 7 11:23 .parallels
drwx----- 3 parallels parallels 4096 Sep 10 13:03 .profile
-rw-r--r-- 1 parallels parallels 807 Jan 7 2022 .ssh
drwx----- 2 parallels parallels 4096 Sep 10 15:55 .sudo_as_admin_successful
-rw-r--r-- 4 parallels parallels 4096 Sep 10 14:27 .thunderbird
drwxr-xr-x 3 parallels parallels 4096 Sep 10 12:27 .vim
-rw-r--r-- 1 parallels parallels 11786 Sep 10 14:56 .viminfo
-rw-r--r-- 1 parallels parallels 3897 Sep 10 13:34 .vmrc
-rw-r--r-- 1 parallels parallels 11786 Sep 10 14:27 .wget-hsts

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parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash snap
parallel@MyHeavyMIP:~$ mkdir -p good/bad/filtee/com
parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash good snap
parallel@MyHeavyMIP:~$ cd good/bad/filtee/com
parallel@MyHeavyMIP:~/good/bad/filtee/com$ vi something.txt
parallel@MyHeavyMIP:~/good/bad/filtee/com$ ls
something.txt
parallel@MyHeavyMIP:~/good/bad/filtee/com$ cd -
parallel@MyHeavyMIP:~$ rm -rf good
parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash snap
parallel@MyHeavyMIP:~$ mkdir -p good/bad/filtee/com
parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash good snap
parallel@MyHeavyMIP:~$ rmdir good
rmdir: failed to remove 'good': Directory not empty
parallel@MyHeavyMIP:~$ rmdir good/bad/filtee/com
parallel@MyHeavyMIP:~$ rmdir -p good/bad/filtee
parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash snap
parallel@MyHeavyMIP:~$ rmdir good/bad/filtee/com
rmdir: failed to remove 'good/bad/filtee/com': No such file or directory
parallel@MyHeavyMIP:~$ mkdir -p good/bad/filtee/com
parallel@MyHeavyMIP:~$ cd good/bad/filtee/com
parallel@MyHeavyMIP:~/good/bad/filtee/com$ vi real/something.txt
parallel@MyHeavyMIP:~/good/bad/filtee/com$ pwd
/home/parallels/good/bad/filtee/com
parallel@MyHeavyMIP:~/good/bad/filtee/com$ cd -
parallel@MyHeavyMIP:~$ rm -rf good
parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash snap
parallel@MyHeavyMIP:~$ clear

parallel@MyHeavyMIP:~$ touch hello
parallel@MyHeavyMIP:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos clash hello snap
parallel@MyHeavyMIP:~$ ls -l
total 40
drwxr-xr-x 2 parallels parallels 4096 Sep  7 11:37 Desktop
drwxr-xr-x 4 parallels parallels 4096 Sep 10 12:59 Documents
drwxr-xr-x 2 parallels parallels 4096 Sep 10 16:13 Downloads
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Music
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Pictures
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Public
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Templates
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Videos
drwxr-xr-x 4 parallels parallels 4096 Jan  1 1970 clash
-rw-rw-r-- 1 parallels parallels  0 Sep 10 16:31 hello
drwx----- 5 parallels parallels 4096 Sep 10 13:07 real
parallel@MyHeavyMIP:~$ touch -m hello -t 2309101322
parallel@MyHeavyMIP:~$ ls -l
total 40
drwxr-xr-x 2 parallels parallels 4096 Sep  7 11:37 Desktop
drwxr-xr-x 2 parallels parallels 4096 Sep 10 12:59 Documents
drwxr-xr-x 4 parallels parallels 4096 Sep 10 16:13 Downloads
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Music
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Pictures
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Public
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Templates
drwxr-xr-x 2 parallels parallels 4096 Sep  3 21:45 Videos
drwxr-xr-x 4 parallels parallels 4096 Jan  1 1970 clash
-rw-rw-r-- 1 parallels parallels  0 Sep 10 13:22 hello
drwx----- 5 parallels parallels 4096 Sep 10 13:07 snap
parallel@MyHeavyMIP:~$

parallel@MyHeavyMIP:~$ mkdir -p good/bad/com/filtee
parallel@MyHeavyMIP:~$ vi good/bad/com/filtee/something.txt
parallel@MyHeavyMIP:~$ cat good/bad/com/filtee/something.txt
#include <stdio.h>

int main(void) {
    printf("Hello world!");
    return 0;
}
parallel@MyHeavyMIP:~$ head good/bad/com/filtee/something.txt
#include <stdio.h>

int main(void) {
    printf("Hello world!");
    return 0;
}
parallel@MyHeavyMIP:~$ vi good/bad/com/filtee/something.c
parallel@MyHeavyMIP:~$ cat good/bad/com/filtee/something.c
#include "stdio.h"
#include "stdlib.h"

#define MAX 5
#define SIGNS 16

typedef struct Date {
    int year;
    int month;
    int day;
} DATE;

typedef struct Grade {
    int math;
    int chinese;
} GRADE;

typedef struct Student {
    char name[10];
    char gender;
    DATE birthday;
```

```

// 保存顺序文件中保存的学生数据
void saveStudentFile(STUDENT student[], int num) {
    FILE *fPtr;
    fPtr = fopen("good/bad/com/filtee/something.c", "w");
    if (fPtr) {
        for (int i = 0; i < num; i++) {
            fprintf(fPtr, "%d\t%d\t%d\t", student[i].id, student[i].birthday.year, student[i].birthday.month, student[i].birthday.day);
            fprintf(fPtr, "%d\t", student[i].grade.math);
            fprintf(fPtr, "%d\t", student[i].grade.chinese);
            fprintf(fPtr, "%d\t", student[i].sign); // 输入签到情况
        }
        fclose(fPtr);
        *num = cnt;
    }
}

// 读取顺序文件中保存的学生数据
int readStudentFile(STUDENT student[], int num) {
    FILE *fPtr;
    fPtr = fopen("good/bad/com/filtee/something.c", "r");
    if (fPtr) {
        for (int i = 0; i < num; i++) {
            fscanf(fPtr, "%d\t%d\t%d\t", &student[i].id, &student[i].birthday.year, &student[i].birthday.month, &student[i].birthday.day);
            fscanf(fPtr, "%d\t", &student[i].grade.math);
            fscanf(fPtr, "%d\t", &student[i].grade.chinese);
            fscanf(fPtr, "%d\t", &student[i].sign); // 输入签到情况
        }
        return 0;
    }
    return -1;
}

// 主函数
int main() {
    STUDENT student[MAX];
    int num = 0;
    int cnt = 0;
    while (1) {
        int choice;
        printf("1. 保存学生数据\n2. 读取学生数据\n3. 退出\n");
        choice = getChoice();
        switch (choice) {
            case 1:
                saveStudentFile(student, num);
                num++;
                break;
            case 2:
                readStudentFile(student, num);
                break;
            case 3:
                return 0;
        }
    }
}

// 编译并运行
// gcc 10.2.1-1ubuntu1~20.04 -std=c99 -c something.c -o something.o
// gcc 10.2.1-1ubuntu1~20.04 -std=c99 -o something something.o
// ./something
```

```

parallel@myHeavyMPP:~$ cd good/bad/com/filtee/
parallel@myHeavyMPP:~/good/bad/com/filtee$ ls
something.c
parallel@myHeavyMPP:~/good/bad/com/filtee$ gcc 10.2.1-1ubuntu1~20.04 -std=c99 -c something.c -o something.o
parallel@myHeavyMPP:~/good/bad/com/filtee$ gcc 10.2.1-1ubuntu1~20.04 -std=c99 -o something something.o
parallel@myHeavyMPP:~/good/bad/com/filtee$ ./something
```

```

parallel@myHeavyMPP:~$ cd good/bad/com/filtee/
parallel@myHeavyMPP:~/good/bad/com/filtee$ ls
something.c
parallel@myHeavyMPP:~/good/bad/com/filtee$ gcc 10.2.1-1ubuntu1~20.04 -std=c99 -c something.c -o something.o
parallel@myHeavyMPP:~/good/bad/com/filtee$ gcc 10.2.1-1ubuntu1~20.04 -std=c99 -o something something.o
parallel@myHeavyMPP:~/good/bad/com/filtee$ ./something
```

（我的实验流程如上，可以放大查看）

<p>小 结</p>	<p>通过本实验，我掌握了：</p> <ol style="list-style-type: none"> <li>1) 虚拟机的安装和使用</li> <li>2) Linux 操作系统的使用</li> <li>3) Linux Terminal 基本命令的使用</li> <li>4) 概念：Linux 的文件系统的基本结构</li> </ol> <p>目前我存在的问题有：</p> <ol style="list-style-type: none"> <li>1) 由于是 Arm64 + MacOS + Parallels 环境，我的虚拟机系统可能与其他同学和模版样例存在些许差异（不影响本次试验结果）</li> <li>2) 对于 Ubuntu Linux 操作系统仍有些许生疏</li> </ol>
<p>指导老师 评 议</p>	<p>成绩评定：_____</p> <p>指导教师签名：_____</p>