

南京邮电大学

实验报告

(2024 / 2025 学年 第 一 学期)

课程名称

Linux 编程

实验名称

Experiment 1

实验时间

2024

年

12

月

10

日

指导单位

计算机学院、软件学院、网络空间安全学院

指导教师

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学院(系)

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专

业

信息安全

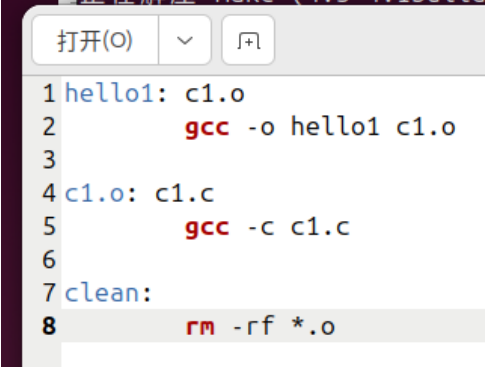
实 验 报 告

实 验 名 称	Experiment 1			指 导 教 师	王磊
实 验 类 型	上机	实验学时	4	实 验 时 间	2024.12.10
<p>一、 实验目的和要求</p> <p>Further use the basic syntax of C programming language in Linux system, deepen the understanding of the knowledge.</p>					
<p>二、实验环境(实验设备)</p> <p>Vm17+ubuntu</p>					

三、实验原理及内容

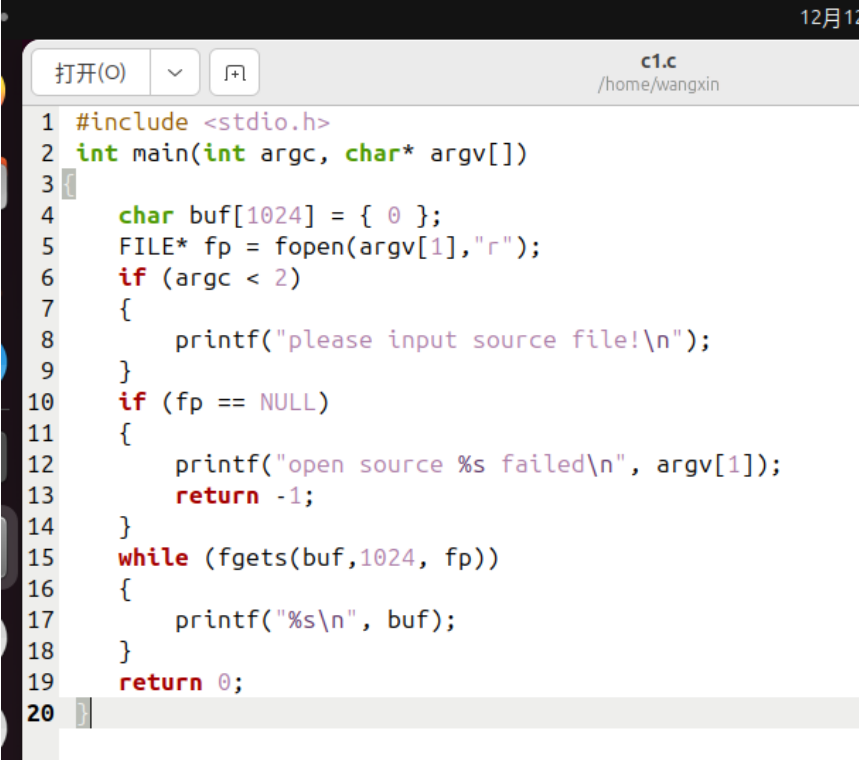
(1) Task 1 (1) Write a C program that uses standard I/O libraries to display the contents of text files. The program is compiled and linked by the make tool, which requires the generation of the.o file first, and then the generation of the executable file, and the function of deleting the intermediate file (.o) in the makefile file

先创建 Makefile 文件



```
1 hello1: c1.o
2     gcc -o hello1 c1.o
3
4 c1.o: c1.c
5     gcc -c c1.c
6
7 clean:
8     rm -rf *.o
```

创建 c1.c



```
12月12日 星期三 14:00
c1.c
/home/wangxin

1 #include <stdio.h>
2 int main(int argc, char* argv[])
3 {
4     char buf[1024] = { 0 };
5     FILE* fp = fopen(argv[1], "r");
6     if (argc < 2)
7     {
8         printf("please input source file!\n");
9     }
10    if (fp == NULL)
11    {
12        printf("open source %s failed\n", argv[1]);
13        return -1;
14    }
15    while (fgets(buf, 1024, fp))
16    {
17        printf("%s\n", buf);
18    }
19    return 0;
20 }
```

运行文件

```

root@wangxin-VMware-Virtual-Platform:/home/wangxin# make
gcc -c c1.c
gcc -o hello1 c1.o
root@wangxin-VMware-Virtual-Platform:/home/wangxin# ./hello1
please input source file!
open source (null) failed

```

```

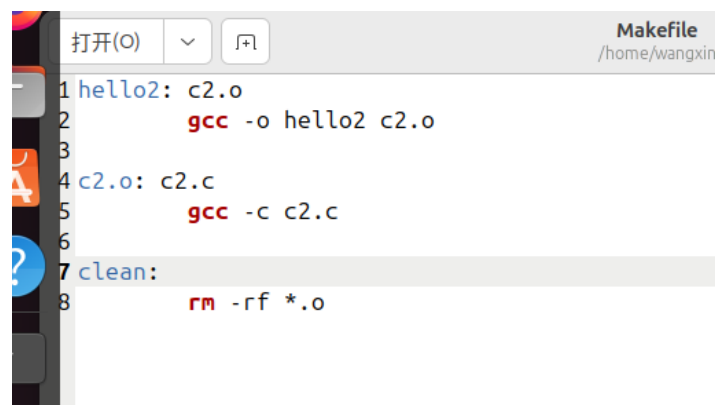
root@wangxin-VMware-Virtual-Platform:/home/wangxin# ./hello1 wangxin2.txt
hello world

root@wangxin-VMware-Virtual-Platform:/home/wangxin#

```

(2) Task 2 (2) Write a C program that displays all the file names in the current directory. The program is compiled and linked by the make tool, which requires the generation of the.o file first, and then the generation of the executable file, and the function of deleting the intermediate file (.o) in the makefile file

写 Makefile 文件




```

1 hello2: c2.o
2     gcc -o hello2 c2.o
3
4 c2.o: c2.c
5     gcc -c c2.c
6
7 clean:
8     rm -rf *.o

```

写 c2.c



```

1 #include <stdio.h>
2 #include <dirent.h>
3 #include <sys/types.h>
4 int main(int argc, char* argv[])
5 {
6     DIR* dirp;
7     struct dirent* direntp;
8     if ((dirp = opendir(argv[1])) == NULL) {
9         printf("error\n");
10        // exit(1);
11    }
12    while ((direntp = readdir(dirp)) != NULL)
13        printf("%s\n", direntp->d_name);
14    closedir(dirp);
15    // exit(0);
16 }

```

运行程序

```

root@wangxin-VMware-Virtual-Platform:/home/wangxin# ./hello2 /home/wangxin
.bash_history
B22040922.sha1
.lesshst
4_1
.bashrc
4_3
cihper.txt
Ex2_4.sh
Ex3_3.c
.
Ex2_3.sh
c1.c
Makefile
helloThread2
pw.enc
4_3.c
homework
mcMultithreads.c
lincoln.txt

```

(3) Task 3 (3) Write a C program that changes the working directory of the current process. The program is compiled and linked by the make tool, which requires the generation of the.o file first, and then the generation of the executable file, and the function of deleting the intermediate file (.o) in the makefile file
编写 Makefile 文件

```

1 hello3: c3.o
2     gcc -o hello3 c3.o
3
4 c3.o: c3.c
5     gcc -c c3.c
6
7 clean:
8     rm -rf *.o

```

编写 c3.c 文件

```

1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <unistd.h>
4 int main(){
5     char buf[1024] = {0};
6     char buf2[1024] = {0};
7     getcwd(buf, 1024);
8     printf("%s\n", buf);
9     if(chdir("/home") < 0){
10         printf("error\n");
11     }
12     else
13     {
14         printf("success\n");
15     }
16     getcwd(buf2, 1024);
17     printf("%s\n", buf2);
18     return 0;
19 }

```

运行程序

```
连接已关闭
root@wangxin-VMware-Virtual-Platform:/home/wangxin# make
gcc -c c3.c
gcc -o hello3 c3.o
root@wangxin-VMware-Virtual-Platform:/home/wangxin# ./hello3
/home/wangxin
success
/home
root@wangxin-VMware-Virtual-Platform:/home/wangxin# ls
```

四、实验小结（包括总结上机调试过程中所遇到的问题和解决方法、感想与建议等）

出现问题：第一题调用 Makefile 时报错 Makefile:2: *** 缺失分隔符。停止。显示这个报错这个错误是因为 Makefile 的命令部分需要用 Tab 键缩进，而不是空格。如果命令部分用了空格，就会导致 make 报错：缺失分隔符。后来将空格全部删去用 Tab 代替成功解决问题。

五、指导教师评语

成 绩		批阅人		日 期	
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