

实验报告

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1 列出目录内容

-l 以长格式显示结果，显示每个文件和目录的权限、所有权、大小和修改日期等额外详细信息。

```
a@ubuntu:~$ ls
compare.sh  Documents  fib.sh  Music  Pictures  Public  Templates  test.sh
Desktop     Downloads  gcd.sh  nar.sh  prime.sh  rho.sh  test       Videos
a@ubuntu:~$ ls -l
总用量 64
-rw-rw-r-- 1 a a 189 Sep 10 07:56 compare.sh
drwxrwxr-x 2 a a 4096 Sep 5 20:02 Desktop
drwxrwxr-x 2 a a 4096 Sep 5 20:02 Documents
drwxrwxr-x 2 a a 4096 Sep 10 04:42 Downloads
-rw-rw-r-- 1 a a 184 Sep 10 10:41 fib.sh
-rw-rw-r-- 1 a a 186 Sep 10 07:48 gcd.sh
drwxrwxr-x 2 a a 4096 Sep 5 20:02 Music
-rw-rw-r-- 1 a a 191 Sep 10 09:12 nar.sh
drwxrwxr-x 2 a a 4096 Sep 10 07:45 Pictures
-rw-rw-r-- 1 a a 400 Sep 10 07:15 prime.sh
drwxrwxr-x 2 a a 4096 Sep 5 20:02 Public
-rw-rw-r-- 1 a a 329 Sep 10 08:04 rho.sh
drwxrwxr-x 2 a a 4096 Sep 5 20:02 Templates
-rw-rw-r-- 1 a a 4 Sep 10 09:58 test
-rwxrwxr-x 1 a a 195 Sep 10 07:07 test.sh
drwxrwxr-x 2 a a 4096 Sep 5 20:02 Videos
a@ubuntu:~$
```

-a 显示所有文件，包括隐藏文件。

```
a@ubuntu:~$ ls -a
.      Documents  Music      .ssh
..     Downloads  nar.sh     .sudo_as_admin_successful
.bash_history  fib.sh     .pam_environment  Templates
.bash_logout   .fib.sh.swp  Pictures      test
.bashrc        gcd.sh       prime.sh      test.sh
.cache         .gnupg       .profile      Videos
compare.sh     .ICEauthority Public        .viminfo
.config        .local       rho.sh        .xinputrc
Desktop       .mozilla     .rpdb
a@ubuntu:~$
```

-R 列出子目录内容。

```

a@ubuntu:~$ ls -R
.:
compare.sh  Documents  fib.sh  Music  Pictures  Public  Templates  test.sh
Desktop    Downloads  gcd.sh  nar.sh  prime.sh  rho.sh  test       Videos

./Desktop:

./Documents:

./Downloads:

./Music:

./Pictures:
'2024-09-10 07-45-45 的屏幕截图.png'

./Public:

./Templates:

./Videos:
a@ubuntu:~$

```

-S 按文件大小排序。

```

a@ubuntu:~$ ls -S
Desktop  Music  Templates  rho.sh  compare.sh  test
Documents  Pictures  Videos  test.sh  gcd.sh
Downloads  Public  prime.sh  nar.sh  fib.sh
a@ubuntu:~$

```

-t 按时间排序。

```

a@ubuntu:~$ ls -t
fib.sh  nar.sh  compare.sh  Pictures  test.sh  Desktop  Music  Templates
test    rho.sh  gcd.sh     prime.sh  Downloads  Documents  Public  Videos
a@ubuntu:~$

```

2 更改目录

cd 或 cd ~ 打开主目录。

```

a@ubuntu:~/Pictures$ cd
a@ubuntu:~$
a@ubuntu:~/Pictures$ cd ~
a@ubuntu:~$

```

cd .. 打开上级目录。

```
a@ubuntu:~/1/2$ cd ..  
a@ubuntu:~/1$
```

cd 文件夹的绝对路径 打开文件夹。

```
a@ubuntu:~$ cd ~/1/2  
a@ubuntu:~/1/2$
```

3 删除空目录

rmkdir可以删除空目录，-v 显示详细输出，-p 递归删除父级目录。

```
a@ubuntu:~$ rmdir 1  
a@ubuntu:~$ rmdir -v 2  
rmdir: 正在删除目录 '2'  
a@ubuntu:~$ rmdir -v -p ~/3/1  
rmdir: 正在删除目录 '/home/a/3/1'  
rmdir: 正在删除目录 '/home/a/3'  
rmdir: 正在删除目录 '/home/a'  
rmdir: 删除目录 '/home/a' 失败: 权限不够  
a@ubuntu:~$
```

4 创建新的空文件

touch命令可以创建空文件，更新指定文件的访问和修改时间。

```
a@ubuntu:~/Desktop/1$ touch 1
a@ubuntu:~/Desktop/1$ ls
1
a@ubuntu:~/Desktop/1$ ls -l
总用量 0
-rw-rw-r-- 1 a a 0 9月 10 23:28 1
a@ubuntu:~/Desktop/1$ touch -m 1
a@ubuntu:~/Desktop/1$ ls -l
总用量 0
-rw-rw-r-- 1 a a 0 9月 10 23:30 1
a@ubuntu:~/Desktop/1$
```

5 复制文件和目录

-r 复制目录中所有内容。-v 在复制过程中显示每个文件的详细内容。

```
a@ubuntu:~/Desktop/1$ cp 1.sh 2
a@ubuntu:~/Desktop/1$ cd 2
a@ubuntu:~/Desktop/1/2$ ls
1.sh
a@ubuntu:~/Desktop/1$ cp -v -r 2 3
'2' -> '3/2'
'2/1.sh' -> '3/2/1.sh'
```

6 移动或重命名文件和目录

mv命令在文件系统中移动文件和目录。

```
a@ubuntu:~$ mv -v fib.sh 1
renamed 'fib.sh' -> '1/fib.sh'
a@ubuntu:~$ cd 1
a@ubuntu:~/1$ ls
fib.sh
a@ubuntu:~/1$
```

7 移除文件和目录

rm命令删除文件和目录。

```
a@ubuntu:~$ rm -r 1
a@ubuntu:~$ ls
compare.sh  Documents  gcd.sh  nar.sh  prime.sh  rho.sh  test  Videos
Desktop    Downloads  Music   Pictures Public   Templates test.sh
```

8 在目录层次结构中搜索文件

```
a@ubuntu:~$ find -name gcd.sh
./gcd.sh
a@ubuntu:~$ find -name "*.sh"
./compare.sh
./gcd.sh
./rho.sh
./test.sh
./local/share/Trash/files/1/2/1.sh
./local/share/Trash/files/1/1.sh
./local/share/Trash/files/1/3/2/1.sh
./local/share/Trash/files/nar.2.sh
./local/share/Trash/files/nar1.sh
./prime.sh
./nar.sh
a@ubuntu:~$ find ./Pictures -name 1.png
./Pictures/1.png
a@ubuntu:~$
```

9 使用条件匹配搜索文本

-i 忽略条件中的大小写区别。-c 只打印匹配行数。

```
a@ubuntu:~$ grep "qwe" 1.sh
qwe
qwe
a@ubuntu:~$ grep -i "qwe" 1.sh
qwe
qwe
QWE
a@ubuntu:~$ grep -i -c "qwe" 1.sh
3
a@ubuntu:~$
```

10 逐行比较文件

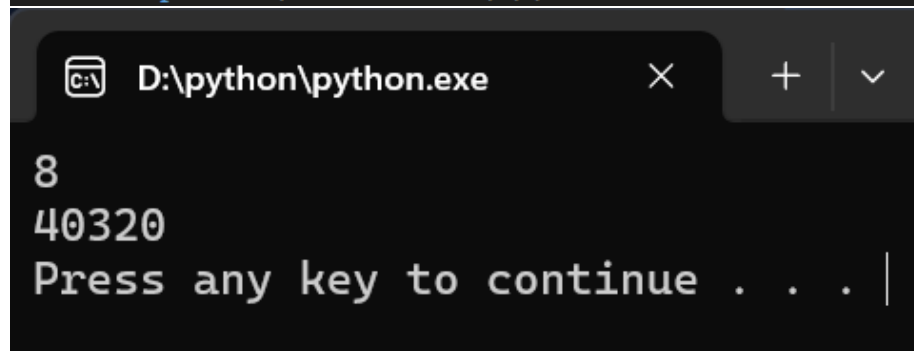
```
a@ubuntu:~$ diff 1.sh 2.sh
1c1
< qwe
---
>
6,7c6
< QWE
< asd
---
>
8a8
>
11c11
< fgh
---
>
a@ubuntu:~$ diff -u 1.sh 2.sh
--- 1.sh      2024-09-11 00:01:09.103773057 -0700
+++ 2.sh      2024-09-11 00:03:59.907776408 -0700
@@ -1,13 +1,13 @@
-qwe
+
+ fgh
+ ukj
+ qwe
+ reg
-QWE
-asd
+
+ asd
+
+ asd
+ hgf
-fgh
+
+ hjg
+ hjk
a@ubuntu:~$
```


11 逐行比较文件

```
def factorial(n):  
    if n == 0:  
        return 1  
    else:  
        return n * factorial(n-1)  
  
n=int(input())  
print(factorial(n))
```

12 python编写一个可以计算给定数的阶乘的程序。

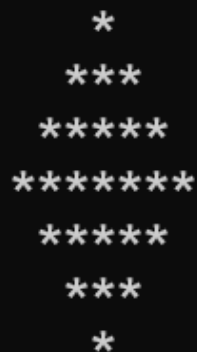
```
def factorial(n):  
    if n == 0:  
        return 1  
    else:  
        return n * factorial(n-1)  
  
n=int(input())  
print(factorial(n))
```



13 python打印出菱形

```
for i in range(4):
    for j in range(3 - i):
        print(" ", end="")
    for k in range(2 * i + 1):
        print("*", end="")
    print()

for i in range(3):
    for j in range(i + 1):
        print(" ", end="")
    for k in range(5 - 2 * i):
        print("*", end="")
    print()
```



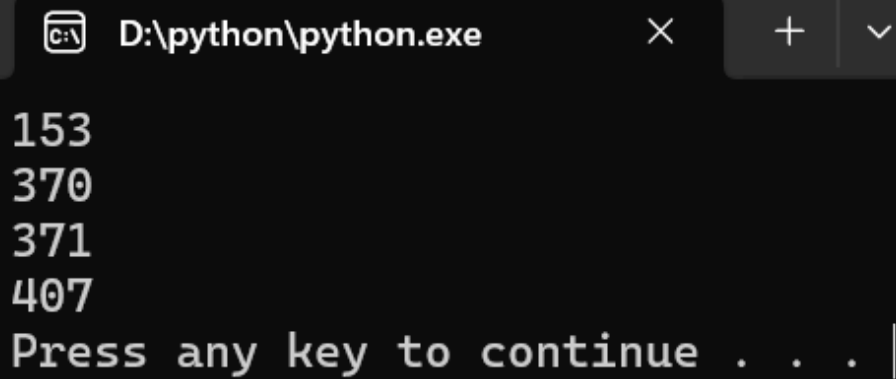
The image shows a screenshot of a Python IDE window titled 'D:\python\python.exe'. The window displays a diamond pattern of asterisks. The pattern consists of two parts: an upper triangle of 4 rows and a lower triangle of 3 rows. The upper triangle has 1, 3, 5, and 7 asterisks respectively. The lower triangle has 5, 3, and 1 asterisks respectively. The pattern is centered in the console window.

```
  *
 ***
*****
*****
*****
  ***
   *
```

Press any key to continue . . . |

14 生成100到1000的水仙花数

```
for i in range(100, 1000):  
    x = i % 10  
    y = (i // 10) % 10  
    z = (i // 100) % 10  
    sum_of_cubes = x**3 + y**3 + z**3  
    if i == sum_of_cubes:  
        print(i)
```



The screenshot shows a terminal window titled "D:\python\python.exe". The output of the program is displayed as follows:

```
153  
370  
371  
407  
Press any key to continue . . . |
```

- 15 输入一行字符，分别统计出其中英文字母、空格、数字和其它字符的个数。

```
letter_count = 0
space_count = 0
digit_count = 0
other_count = 0

user_input = input()

for c in user_input:
    if c.isalpha():
        letter_count += 1
    elif c.isdigit():
        digit_count += 1
    elif c == ' ':
        space_count += 1
    else:
        other_count += 1

print(f"letter = {letter_count}, number = {digit_count}, space = {space_count}, other = {other_count}")
```

D:\python\python.exe × + ▾

1234 567 ased j j ?><!@
letter = 6, number = 7, space = 5, other = 5
Press any key to continue . . . |

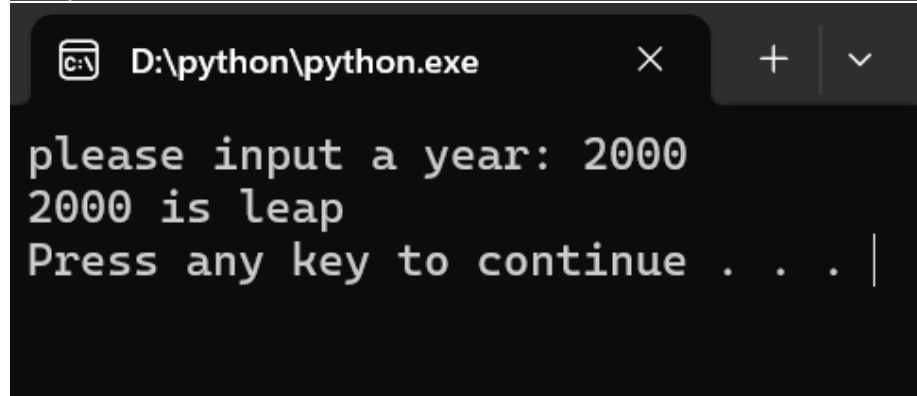
- 16 求125之内自然数中偶数之和

```
NUM = 125
sum_even = sum(i for i in range(1, NUM) if i % 2 == 0)
print(f"125之内的偶数之和为: {sum_even}")
```

sum=3906
请按任意键继续 . . . |

17 判断某一年是否是闰年

```
def is_leap_year(year):  
    if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):  
        return True  
    else:  
        return False  
  
year = int(input("please input a year: "))  
if is_leap_year(year):  
    print(str(year) + " is leap")  
else:  
    print(str(year) + " isn't leap")
```



```
D:\python\python.exe  
please input a year: 2000  
2000 is leap  
Press any key to continue . . . |
```

18 判断某一年是否是闰年

```
def is_prime(n):  
    if n <= 1:  
        return False  
    for i in range(2, n):  
        if n % i == 0:  
            return False  
    return True  
  
n = int(input("Please enter a number:"))  
if is_prime(n):  
    print("It's a prime number!")  
else:  
    print("Not a prime number!")
```



D:\python\python.exe



Please enter a number:532

Not a prime number!

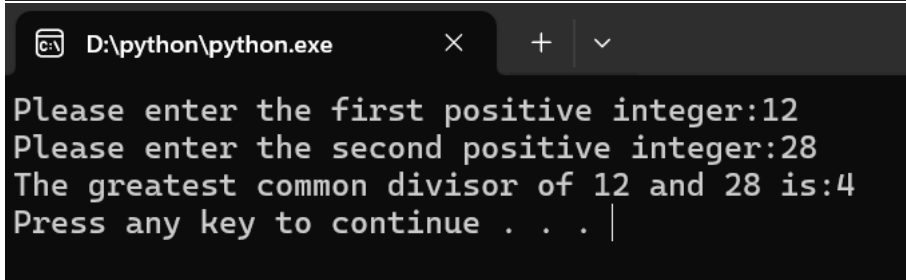
Press any key to continue . . . |

19 求两个正整数的最大公约数。

```
def gcd(a, b):
    while b != 0:
        a, b = b, a % b
    return a

# 示例使用
num1 = int(input("Please enter the first positive integer:"))
num2 = int(input("Please enter the second positive integer:"))

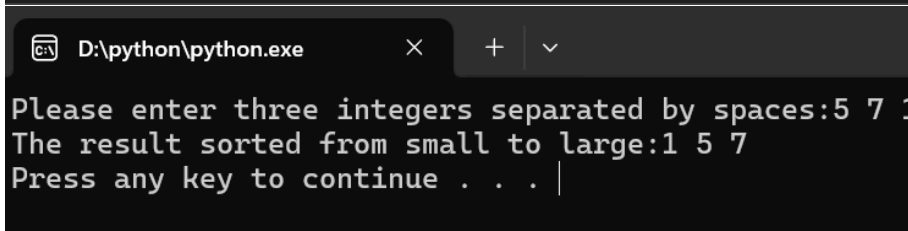
print(f"The greatest common divisor of {num1} and {num2} is:{gcd(num1, num2)}")
```



The screenshot shows a terminal window titled 'D:\python\python.exe'. The prompt 'Please enter the first positive integer:' is followed by the input '12'. The next prompt 'Please enter the second positive integer:' is followed by the input '28'. The program then outputs 'The greatest common divisor of 12 and 28 is:4' and ends with 'Press any key to continue . . . |'.

20 输入三个整数把这三个数由小到大输出

```
x, y, z = map(int, input("Please enter three integers separated by spaces:").split())
if x > y:
    x, y = y, x
if x > z:
    x, z = z, x
if y > z:
    y, z = z, y
print(f"The result sorted from small to large:{x} {y} {z}")
```



The screenshot shows a terminal window titled 'D:\python\python.exe'. The prompt 'Please enter three integers separated by spaces:' is followed by the input '5 7 1'. The program then outputs 'The result sorted from small to large:1 5 7' and ends with 'Press any key to continue . . . |'.

21 感悟

学习Linux命令行环境和Python，对我来说，是一种深刻的技术成长和个人修行的过程。Linux命令行环境，像一扇通往底层系统神秘世界的大门，让我逐渐揭开了操作系统内部的复杂性

和精妙设计。每一个命令，都像是与计算机对话的一种方式，通过它们，我学会了如何高效地管理文件、监控系统状态、以及自动化日常任务。

<https://github.com/asd279/myrepo>