

使用python实现了要求的全部功能

模块的设计 and 对应功能如下：

ls命令

1. handle_ls模块更具-a, -R, -d 或无指定参数来决定有哪些文件以及文件夹需要被展示，例如 -a就需要添加“.”和“..”。

```
def handle_ls(path,command):
    notOriginList = True
    for i in command:
        if(len(command)==1):
            break
        if i == '-a':
            list = ['.','..'] + os.listdir(path)
            notOriginList = False
            break
        elif i == '-R':
            command.remove('-R')
            list = []
            getAllFilesRecursive(path,list,command)
            notOriginList = False
            break
        elif i == '-d':
            list = ['.']
            notOriginList = False
            break
    if notOriginList == True:
        list = os.listdir(path)

    ans = []
    for i in list:
        # 遍历list，获取每个文件的各种属性
        ans.append( each_ls(path,i))
    printFormatted(ans)
```

2. 对于每个文件或文件夹，根据参数获取其对应的信息

使用python的os库，使用其中的os.lstat()方法获取所需要的各类信息

```
def each_ls(path,i):
    path = os.path.join(path,i)
    fileStats = os.lstat(path)
    ret =[]
    # flag在最初更具输入的命令确定，具体见源码
    global flag_i
```

```

global flag_l
if flag_i == True:
    ret = ret + [str(fileStats.st_ino)]
if flag_l == True:
    ret = ret + [
        filemode(fileStats.st_mode),
        str(fileStats.st_nlink),
        getpwuid(fileStats.st_uid).pw_name,
        getgrgid(fileStats.st_gid).gr_name,
        str(fileStats.st_size),
        formatted_time(fileStats.st_mtime),
    ]
ret = ret + [i]
return ret

```

3. 对于获取的信息格式化

例如格式化时间使用如下方法

```

def formatted_time(st_mtime):
    dt = datetime.datetime.fromtimestamp(st_mtime)
    return dt.strftime('%b %d %H:%M')

```

wc命令

1. 使用python中的open, 关键代码如下

```

for filename in filenames:
    chars = 0
    words = 0
    lines = 0
    try:
        with open(os.path.join(os.getcwd(), filename)) as fh:
            for line in fh:
                lines += 1
                words += len(line.split())
                chars += len(line)
            results.append([
                str(lines),
                str(words),
                str(chars),
                str(filename)
            ])
    except Exception as err:
        print(err)

```

运行截图

运行环境 ubuntu 20.04, python版本3.8.10

ls

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls  
bye.c  
dir1  
hello.cpp  
ls.py
```

ls -l

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -l  
-rwxrwxrwx 1 zyz zyz 120 Apr 07 11:56 bye.c  
drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:17 dir1  
-rwxrwxrwx 1 zyz zyz 108 Apr 07 11:57 hello.cpp  
-rwxrwxrwx 1 zyz zyz 4078 Apr 07 20:30 ls.py
```

ls -a

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -a  
.  
..  
bye.c  
dir1  
hello.cpp  
ls.py
```

ls -R

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -R  
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 :  
bye.c  
dir1  
hello.cpp  
ls.py  
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业/dir1 :  
dir1_java.java  
dir2  
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业/dir1/dir2 :  
index.html
```

ls -li

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -li  
10414574138325129 bye.c  
9570149208194401 dir1  
32369622321753306 hello.cpp  
66991044457146544 ls.py
```

ls -d

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -d
```

ls 参数组合

ls -l -i

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -l -i
10414574138325129 -rwxrwxrwx 1 zyz zyz 120 Apr 07 11:56 bye.c
9570149208194401 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:17 dir1
32369622321753306 -rwxrwxrwx 1 zyz zyz 108 Apr 07 11:57 hello.cpp
66991044457146544 -rwxrwxrwx 1 zyz zyz 3675 Apr 07 20:48 ls.py
```

ls -R -l -i

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -R -l -i
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 :
10414574138325129 -rwxrwxrwx 1 zyz zyz 120 Apr 07 11:56 bye.c
9570149208194401 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:17 dir1
32369622321753306 -rwxrwxrwx 1 zyz zyz 108 Apr 07 11:57 hello.cpp
66991044457146544 -rwxrwxrwx 1 zyz zyz 3675 Apr 07 20:48 ls.py
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业/dir1 :
30399297484781856 -rwxrwxrwx 1 zyz zyz 121 Apr 07 11:57 dir1_java.java
2814749767363145 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:18 dir2
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业/dir1/dir2 :
9288674231650506 -rwxrwxrwx 1 zyz zyz 274 Apr 07 11:18 index.html
```

ls -R -l -i -a

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 ls -R -l -i -a
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 :
54606145481895183 drwxrwxrwx 1 zyz zyz 4096 Apr 07 20:09 .
6192449487736612 drwxrwxrwx 1 zyz zyz 4096 Apr 07 19:59 ..
10414574138325129 -rwxrwxrwx 1 zyz zyz 120 Apr 07 11:56 bye.c
9570149208194401 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:17 dir1
32369622321753306 -rwxrwxrwx 1 zyz zyz 108 Apr 07 11:57 hello.cpp
66991044457146544 -rwxrwxrwx 1 zyz zyz 3675 Apr 07 20:48 ls.py
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业/dir1 :
9570149208194401 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:17 .
54606145481895183 drwxrwxrwx 1 zyz zyz 4096 Apr 07 20:09 ..
30399297484781856 -rwxrwxrwx 1 zyz zyz 121 Apr 07 11:57 dir1_java.java
2814749767363145 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:18 dir2
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业/dir1/dir2 :
2814749767363145 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:18 .
9570149208194401 drwxrwxrwx 1 zyz zyz 4096 Apr 07 11:17 ..
9288674231650506 -rwxrwxrwx 1 zyz zyz 274 Apr 07 11:18 index.html
```

wc命令，支持后跟多个文件

wc bye.c

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 wc bye.c
7      13      98      bye.c
```

wc bye.c ls.py

```
/mnt/c/Users/zhuyize/Desktop/linux_第三次作业 wc bye.c ls.py
7      13      98      bye.c
143    321    3553    ls.py
```