



CT5052NP Network Operating System (NOS)

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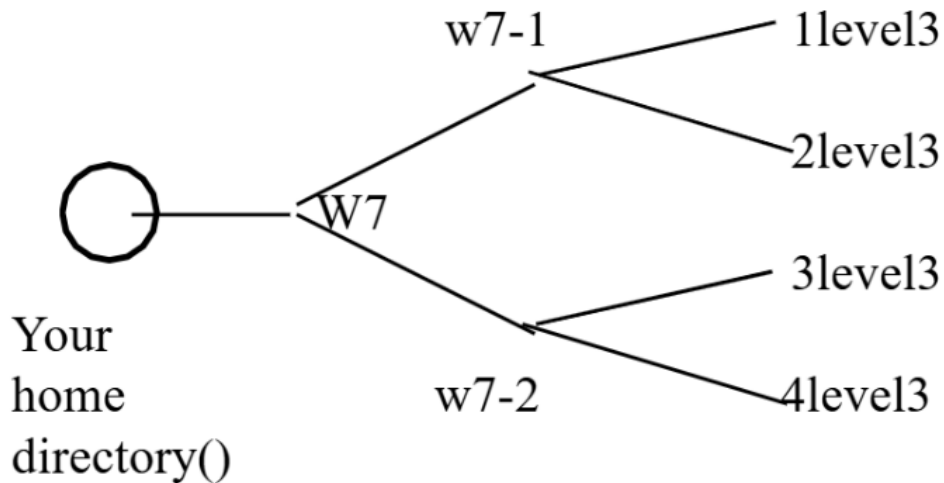
Londonmet Id: 23048939

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Submitted to Prasant Adhikari

1. Practice in using UNIX utilities:

- 1) Create the directory structure presented in the figure below. Use **mkdir** command and relative pathnames from your home directory. Try both: no option and **-p** option, for the command.



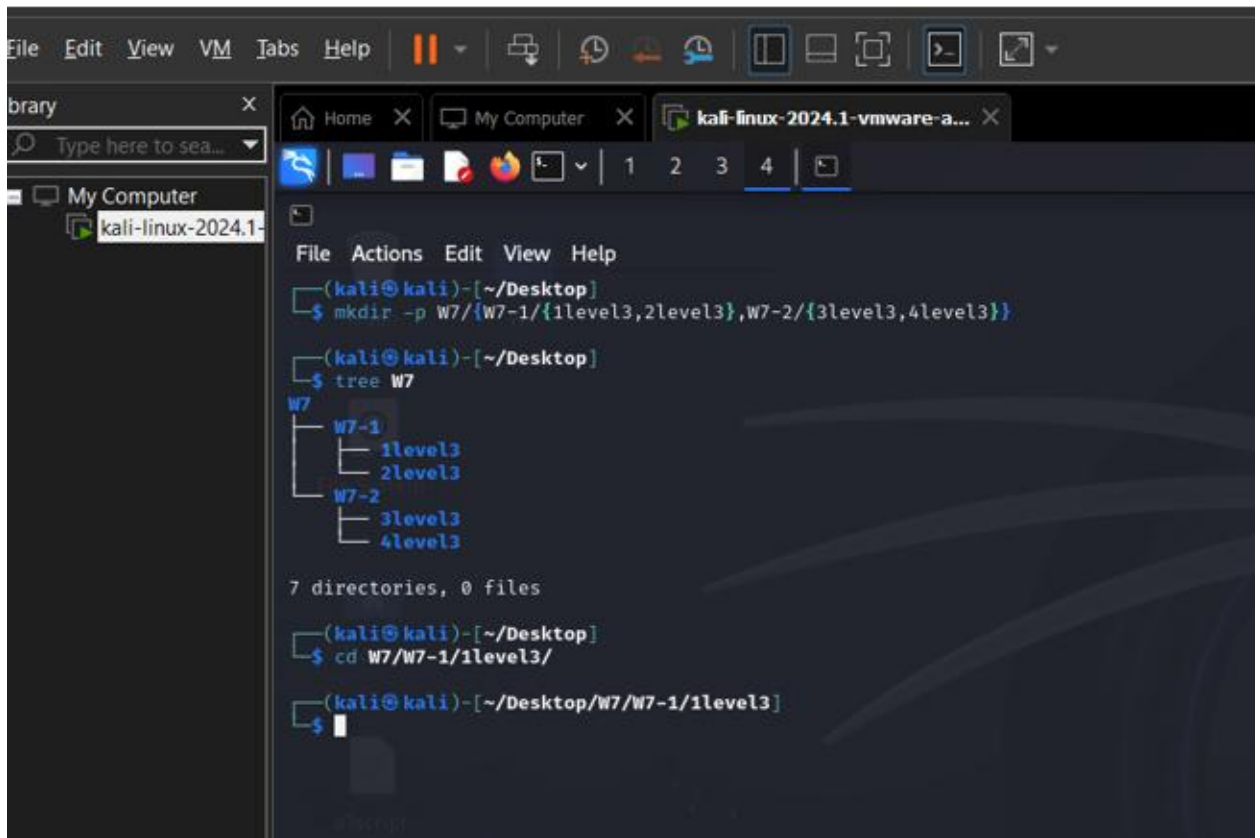
```
File Edit View VM Tabs Help
Library
Type here to sea...
My Computer
kali-linux-2024.1-
kali@kali:~/Desktop$ mkdir -p W7/{W7-1/{1level3,2level3},W7-2/{3level3,4level3}}
kali@kali:~/Desktop$ tree W7
W7
├── W7-1
│   ├── 1level3
│   └── 2level3
└── W7-2
    ├── 3level3
    └── 4level3
```

The screenshot shows a terminal window with the following commands and output:

```
(kali@kali)-[~/Desktop]
$ mkdir -p W7/{W7-1/{1level3,2level3},W7-2/{3level3,4level3}}

(kali@kali)-[~/Desktop]
$ tree W7
W7
├── W7-1
│   ├── 1level3
│   └── 2level3
└── W7-2
    ├── 3level3
    └── 4level3
```

2. Change to the **1level3** directory by one step using a relative pathname.



The screenshot shows a Kali Linux terminal window with a dark theme. The terminal displays the following commands and output:

```
(kali@kali)-[~/Desktop]
$ mkdir -p W7/{W7-1/{1level3,2level3},W7-2/{3level3,4level3}}

(kali@kali)-[~/Desktop]
$ tree W7
W7
├── W7-1
│   ├── 1level3
│   └── 2level3
└── W7-2
    ├── 3level3
    └── 4level3

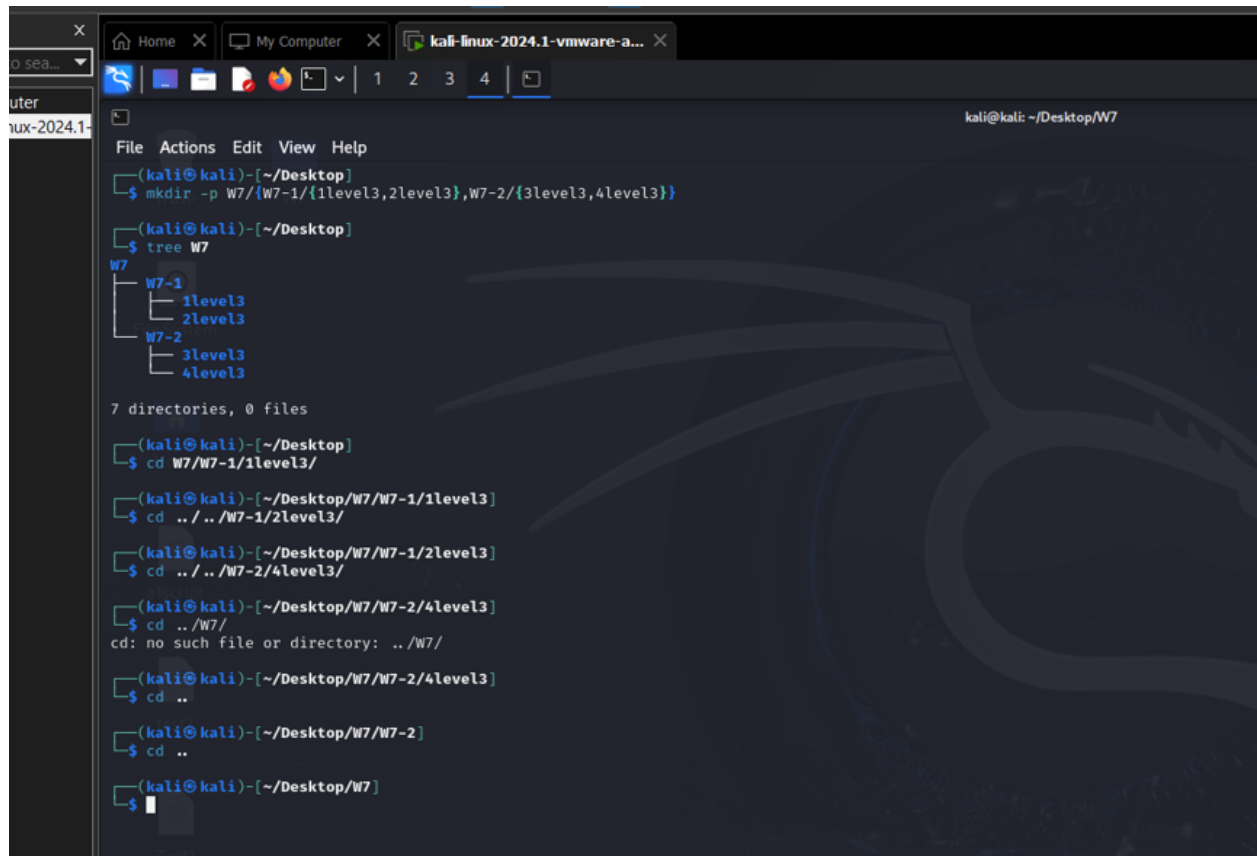
7 directories, 0 files

(kali@kali)-[~/Desktop]
$ cd W7/W7-1/1level3/

(kali@kali)-[~/Desktop/W7/W7-1/1level3]
$
```

The terminal window has a menu bar with 'File', 'Actions', 'Edit', 'View', and 'Help'. The left sidebar shows a file explorer with 'My Computer' and 'kali-linux-2024.1'.

3. Practice in changing directories in your directory structure by one command using relative pathnames, e.g., from **1level3** to **2level3**, from **2level3** to **4level3**, from **4level3** to **W7**, etc. Use names of parent and child directories ('.' and '..') as well.



A terminal window titled 'kali-linux-2024.1-vmware-a...' showing the creation of a directory structure. The user runs 'mkdir -p W7/{W7-1/{1level3,2level3},W7-2/{3level3,4level3}}' and 'tree W7' to display the structure. The tree shows 'W7' containing 'W7-1' (with '1level3' and '2level3') and 'W7-2' (with '3level3' and '4level3'). The user then navigates through the directories using 'cd' commands: 'cd W7/W7-1/1level3/', 'cd ../../W7-1/2level3/', 'cd ../../W7-2/4level3/', 'cd ../W7/', 'cd ..', 'cd ..', and finally 'cd ..' to return to '~/Desktop/W7'.

```
(kali@kali)-[~/Desktop]
$ mkdir -p W7/{W7-1/{1level3,2level3},W7-2/{3level3,4level3}}

(kali@kali)-[~/Desktop]
$ tree W7
W7
├── W7-1
│   ├── 1level3
│   └── 2level3
└── W7-2
    ├── 3level3
    └── 4level3

7 directories, 0 files

(kali@kali)-[~/Desktop]
$ cd W7/W7-1/1level3/

(kali@kali)-[~/Desktop/W7/W7-1/1level3]
$ cd ../../W7-1/2level3/

(kali@kali)-[~/Desktop/W7/W7-1/2level3]
$ cd ../../W7-2/4level3/

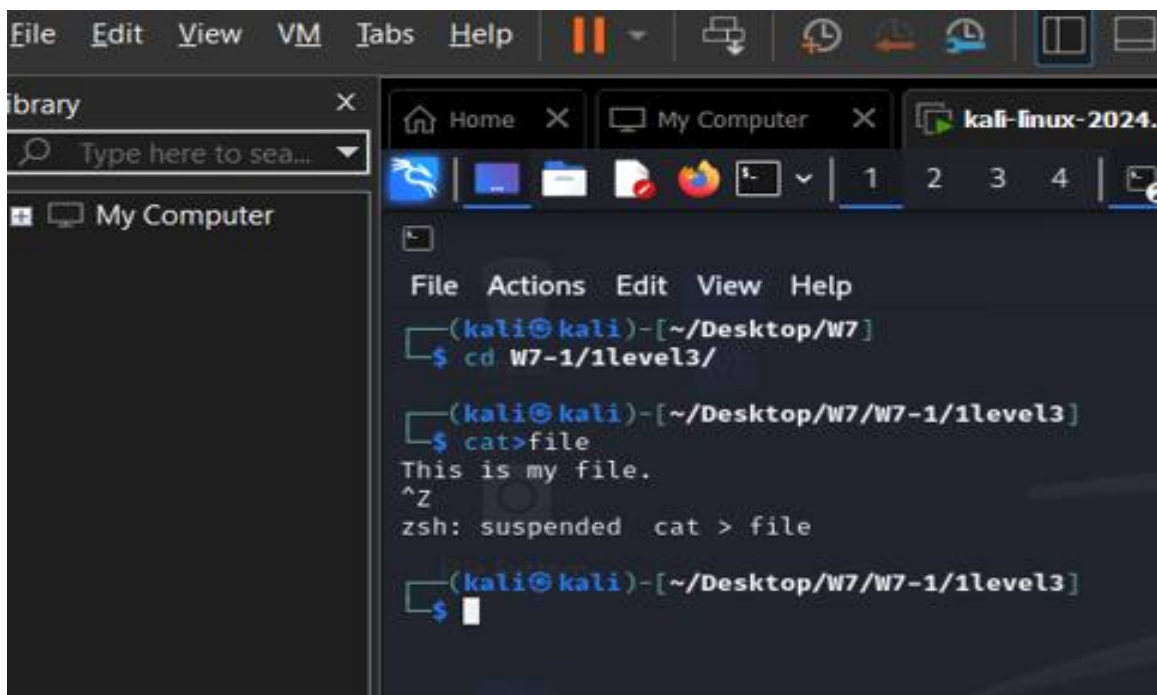
(kali@kali)-[~/Desktop/W7/W7-2/4level3]
$ cd ../W7/
cd: no such file or directory: ../W7/

(kali@kali)-[~/Desktop/W7/W7-2/4level3]
$ cd ..

(kali@kali)-[~/Desktop/W7/W7-2]
$ cd ..

(kali@kali)-[~/Desktop/W7]
$
```

4. Change to **1level3** and create a text file by any tool (e.g., by **cat** or **cal** like last tutorial).



A terminal window titled 'kali-linux-2024.1-vmware-a...' showing the user navigating to '~/Desktop/W7/W7-1/1level3' and creating a file named 'file' using the 'cat' command. The user enters 'cat>file' and 'This is my file.' followed by '^Z'. The terminal shows 'zsh: suspended cat > file'. The user then presses 'Ctrl+C' to return to the prompt in '~/Desktop/W7/W7-1/1level3'.

```
(kali@kali)-[~/Desktop/W7]
$ cd W7-1/1level3/

(kali@kali)-[~/Desktop/W7/W7-1/1level3]
$ cat>file
This is my file.
^Z
zsh: suspended cat > file

(kali@kali)-[~/Desktop/W7/W7-1/1level3]
$
```

5. Copy this text file from **1level3** to **1level3** (with the name **file1**), **2level3**, and to **3level3** changing its name. Show that these files in corresponding directories.

```
(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ cp file file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls
file file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ cp file ../2level3/

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls ../2level3/
file

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ cp file ../../W7-2/3level3/

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls ../../W7-2/3level3/
file

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$
```

6. Move this file to **4level3**. Show that there is this file in **4level3** and there is not in **1level3**.

```
(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ mv file ../../W7-2/4level3/

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls ../../W7-2/4level3/
file

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls
file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$
```

7. Print the following texts each in one **echo** or **printf** command:

- Hello! I can do it
 - $5 > (20:8) < (30 * 2)$
 - Line 1 Line 2
- a-b, A-B, -, +, <, >, #, \$, %, &.

```
(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ echo -e "Hello! I can do it\n5>(20:8)<(30*2)\nline1\nLine2\na-b,A-B,-,+,<,>,#,$,%,&,"
Hello! I can do it
5>(20:8)<(30*2)
line1
Line2
a-b,A-B,-,+,<,>,#,$,%,&,

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$
```

8. Give the **ls** command (without options and with **a**, **d**, **g**, **l**, **R** options) in home directory, **w7**, **w7-1**, and **1level3** directories. Explain for yourself the results received.

```
(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls
file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -a
.  ..  file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -d
.

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -g
total 4
-rw-r--r-- 1 kali 17 Dec 20 04:07 file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -l
total 4
-rw-r--r-- 1 kali kali 17 Dec 20 04:07 file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -R
.:
file1
```

9. Change to the **W7** directory. Remove the directory files **w7-2**, **3level-3**, **4level3** and all ordinary files in them. Use the option **-i** of the **rm** and **rmdir** commands. Show that there are not these ordinary and directory files in your file structure.

W7-1 W7-2

./W7-1:

1level3 2level3

./W7-1/1level3:

file1

./W7-1/2level3:

file

./W7-2:

3level3 4level3

./W7-2/3level3:

file

outputfiles

./W7-2/4level3:

file

10. Change to **w7-1**.

- Display access permissions for the file **file1**

in **1level3**.

- Remove all access permissions for this file.
- Display access permissions for this file.
- Try to read this file using any utility (e.g.,

cat).

- Try to write into this file using any utility (e.g., **cat** with the sign **>>** – *append*).
- Add read and write access permissions for yourself for this file.
- Display access permissions for this file.
- Try to read this file using any utility.
- Try to write into this file using any utility.

```
(kali㉿kali)-[~/Desktop/W7/W7-1]
$ cd 1level3

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls
file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -a
.. file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -d

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -g
total 4
-rw-r--r-- 1 kali 17 Dec 20 04:07 file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -l
total 4
-rw-r--r-- 1 kali kali 17 Dec 20 04:07 file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$ ls -R
:
file1

(kali㉿kali)-[~/Desktop/W7/W7-1/1level3]
$
```

```

(kali@kali)-[~/Desktop/W7]
$ rm -i W7-2/3level3/*
sh: sure you want to delete all the files in /home/kali/Desktop/W7/W7-2/3level3 [yn]? y
n: remove regular file 'W7-2/3level3/file'? y

(kali@kali)-[~/Desktop/W7]
$ rm -i W7-2/4level3/*
sh: sure you want to delete all the files in /home/kali/Desktop/W7/W7-2/4level3 [yn]? y
n: remove regular file 'W7-2/4level3/file'? y

(kali@kali)-[~/Desktop/W7]
$ tree W7
7 [error opening dir]

directories, 0 files

(kali@kali)-[~/Desktop/W7]
$ ls W7-2/3level3/

(kali@kali)-[~/Desktop/W7]
$ ls W7-2/4level3/
file

(kali@kali)-[~/Desktop/W7]
$ rm -i W7-2/4level3/*
sh: sure you want to delete all the files in /home/kali/Desktop/W7/W7-2/4level3 [yn]? y
n: remove regular file 'W7-2/4level3/file'? y

(kali@kali)-[~/Desktop/W7]
$ ls W7-2/4level3/

```

11. (Now,)

- Display access permissions for **1level3**.
- Remove all access permissions for the
- **1level3** directory.
- Display access permissions for **1level3**.
- Try to read a file from **1level3** using any utility.
- Try to put a file into **1level3** using any utility.
- Try to search in **1level3** using any command (e.g., the **ls** command).
- Add read, write, and execute access permissions for yourself for the **1level3** directory.
- Display access permissions for **1level3**.
- Try to read a file from **1level3** using any utility.
- Try to put a file into **1level3** using any utility.

- Try to search in **1level3** using any command (e.g., the **ls** command).

```
(kali@kali)~[/Desktop/W7/W7-1]
$ ls -l 1level3/file1
-rw-r--r-- 1 kali kali 17 Dec 20 22:15 1level3/file1

(kali@kali)~[/Desktop/W7/W7-1]
$ chmod u -rw 1level3/file1
chmod: cannot access 'u': No such file or directory

(kali@kali)~[/Desktop/W7/W7-1]
$ chmod u-rw 1level3/file1

(kali@kali)~[/Desktop/W7/W7-1]
$ ls -l 1level3/file1
-rw-r--r-- 1 kali kali 17 Dec 20 22:15 1level3/file1

(kali@kali)~[/Desktop/W7/W7-1]
$ cat 1level3/file1
cat: 1level3/file1: Permission denied

(kali@kali)~[/Desktop/W7/W7-1]
$ cat >> 1level3/file1
zsh: permission denied: 1level3/file1

(kali@kali)~[/Desktop/W7/W7-1]
$ chmod u+rw 1level3/file1

(kali@kali)~[/Desktop/W7/W7-1]
$ ls -l 1level3/file1
-rw-rw-r-- 1 kali kali 17 Dec 20 22:15 1level3/file1

(kali@kali)~[/Desktop/W7/W7-1]
$ cat 1level3/file1
This is my file.

(kali@kali)~[/Desktop/W7/W7-1]
$ cat >> 1level3/file1

This is my second file
```

```
(kali㉿kali)-[~/Desktop/W7/W7-1]
$ ls -l 1level3
total 4
-rw----- 1 kali kali 41 Dec 20 23:08 file1

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ chmod u= 1level3
no system

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ cat 1level3/file1
cat: 1level3/file1: Permission denied

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ mv ../../test1 1level3/
mv: cannot stat '../../test1': No such file or directory

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ find 1level3
1level3
find: '1level3': Permission denied

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ chmod u+rwX 1level3

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ ls -l 1level3
total 4
-rw----- 1 kali kali 41 Dec 20 23:08 file1

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ cat 1level3/file1
This is my file.

This is my second file

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ mv ../../test1 1level3/
mv: cannot stat '../../test1': No such file or directory

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ ls 1level3
file1

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ mv ../../test1 1level3/
```

```
(kali㉿kali)-[~/Desktop/W7/W7-1]
$ mv ../../test1 1level3/
mv: cannot stat ' ../../test1': No such file or directory

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ ls 1level3
file1

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ mv ../../test1 1level3/

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ ls 1level3
file1 test1

(kali㉿kali)-[~/Desktop/W7/W7-1]
$ find 1level3
1level3
1level3/test1
1level3/file1

(kali㉿kali)-[~/Desktop/W7/W7-1]
$
```