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Assignment – 2: Bash Shell Basics

Task 1: File and Directory Manipulation

1. Create a directory called "my_directory".
   ($ mkdir my_directory)

2. Navigate into the "my_directory".
   ($ cd my_directory)

3. Create an empty file called "my_file.txt".
   ($ touch my_file)

```
kali@kali: ~/Kamalesh/my_directory
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ touch my_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
my_file.txt
```

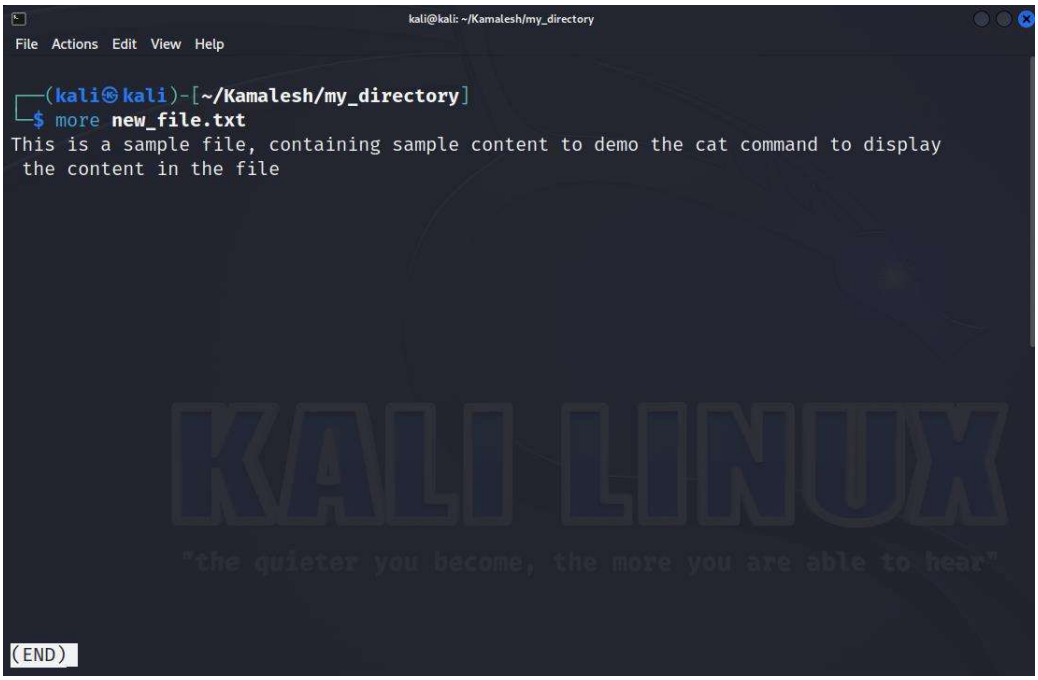
4. List all the files and directories in the current directory.
   ($ ls)

```
kali@kali: ~/Kamalesh/my_directory
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ pwd
/home/kali/Kamalesh/my_directory

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
my_file.txt
```

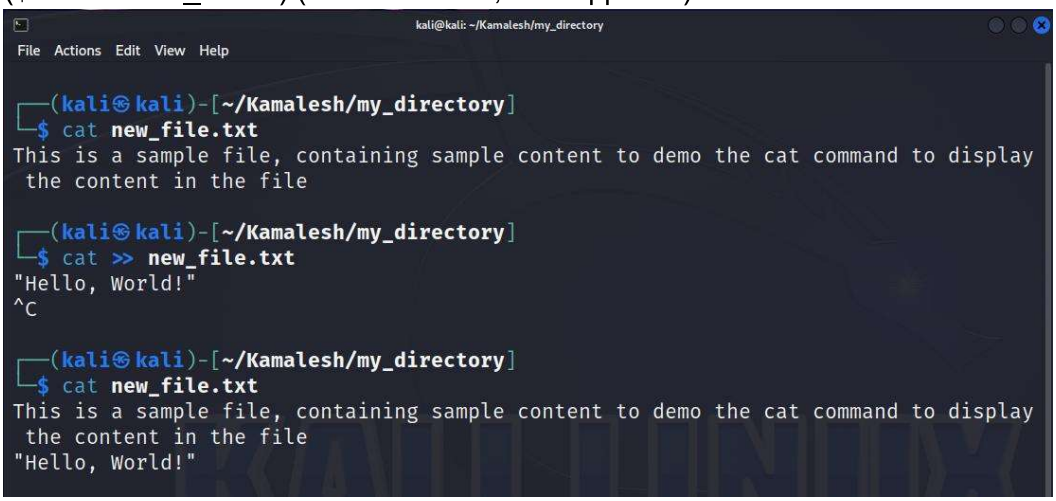
5. Rename "my_file.txt" to "new_file.txt".
   ($ mv myfile.txt new_file.txt)

```
kali@kali: ~/Kamalesh/my_directory
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
my_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ mv my_file.txt new_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
new_file.txt
```

6. Display the content of "new_file.txt" using a pager tool of your choice.
   (used '$ cat > new_file.txt' to write contents in the text file;
   used pager command '$ more' to display the content within pager format)



7. Append the text "Hello, World!" to "new_file.txt".
   ($ cat >> new_file.txt) (> - overwrites ; >> - appends)



8. Create a new directory called "backup" within "my_directory".
   ($ mkdir backup)

```
kali@kali: ~/Kamalesh/my_directory
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
new_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ mkdir backup

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
backup  new_file.txt
```

9. Move "new_file.txt" to the "backup" directory.
   ($ mv new_file.txt backup)

```
kali@kali: ~/Kamalesh/my_directory
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls
backup  new_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ cat new_file.txt
This is a sample file, containing sample content to demo the cat command to display
 the content in the file
"Hello, World!"

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ mv new_file.txt backup
```

10. Verify that "new_file.txt" is now located in the "backup" directory.
    ($ cd backup – to navigate to the directory)

($ cat new_file.txt - to display the content of the file)

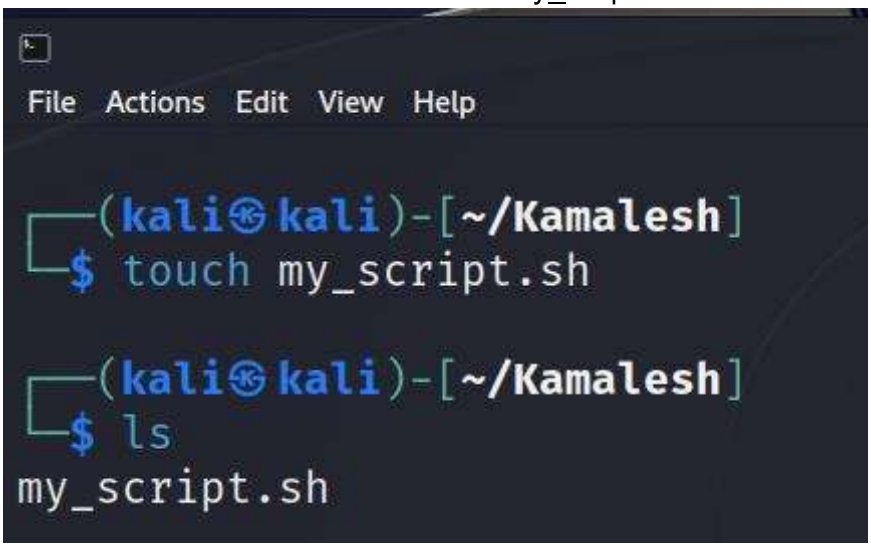
```
┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ mv new_file.txt backup

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ cd backup && ls
new_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory/backup]
└─$ cat new_file.txt
This is a sample file, containing sample content to demo the cat command to display
 the content in the file
"Hello, World!"
```

11. Delete the "backup" directory and all its contents.
    ($ rm backup – wouldn't delete a non-empty directory)
    ($ rm –rf backup -The option –r deletes non-empty directories as well)

```
kali@kali: ~/Kamalesh/my_directory
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh/my_directory/backup]
└─$ ls
new_file.txt

┌──(kali㉿kali)-[~/Kamalesh/my_directory/backup]
└─$ cd .. && ls
backup

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ rm -rf backup

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$ ls

┌──(kali㉿kali)-[~/Kamalesh/my_directory]
└─$
```

Task 2: Permissions and Scripting

- Create a new file called "my_script.sh".



- Edit "my_script.sh" using a text editor of your choice and add the following lines:

bash

#!/bin/bash
echo "Welcome to my script!"
echo "Today's date is $(date)."
Save and exit the file.

Note:
I've just added the above lines as specified and I've not considered the phrase 'Save and exit file' as an Ouput, but as an instruction for the assigment alone.

```
kali@kali: ~/Kamalesh
File  Actions  Edit  View  Help
  GNU nano 7.2                    my_script.sh
                                       bash
                                  #!/bin/bash
echo "                      Welcome to my script!"
echo "          Today's date is $(date)."
                                  #Save and exit the file.

                                 [ Wrote 5 lines ]
^G Help        ^O Write Out   ^W Where Is    ^K Cut        ^T Execute
^X Exit        ^R Read File   ^\ Replace     ^U Paste      ^J Justify
```

- Make "my_script.sh" executable.

```
kali@kali: ~/Kamalesh
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh]
└─$ nano my_script.sh

┌──(kali㉿kali)-[~/Kamalesh]
└─$ ls -l
total 4
-rw-r--r-- 1 kali kali 160 May 28 06:22 my_script.sh

┌──(kali㉿kali)-[~/Kamalesh]
└─$ chmod a+x my_script.sh

┌──(kali㉿kali)-[~/Kamalesh]
└─$ ls -l
total 4
-rwxr-xr-x 1 kali kali 160 May 28 06:22 my_script.sh
```

- Run "my_script.sh" and verify that the output matches the expected result.

Observation:
'Bash' runs first, and the shell enters Bash entry.
By exiting Bash by using 'exit' the rest of the script is executed that prints the specified content, including the $(date) command.

Task 3: Command Execution and Pipelines

- List all the processes running on your system using the "ps" command.
  ($ ps aux – to display all process running on my system)

```
kali@kali: ~/Kamalesh
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh]
└─$ ps aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.0  0.3 167740 12160 ?        Ss   04:59   0:02 /sbin/init
root           2  0.0  0.0      0     0 ?        S    04:59   0:00 [kthreadd]
root           3  0.0  0.0      0     0 ?        I<   04:59   0:00 [rcu_gp]
root           4  0.0  0.0      0     0 ?        I<   04:59   0:00 [rcu_par_g
root           5  0.0  0.0      0     0 ?        I<   04:59   0:00 [slub_flus
root           6  0.0  0.0      0     0 ?        I<   04:59   0:00 [netns]
root          10  0.0  0.0      0     0 ?        I<   04:59   0:00 [mm_percpu
root          11  0.0  0.0      0     0 ?        I    04:59   0:00 [rcu_tasks
root          12  0.0  0.0      0     0 ?        I    04:59   0:00 [rcu_tasks
root          13  0.0  0.0      0     0 ?        I    04:59   0:00 [rcu_tasks
root          14  0.0  0.0      0     0 ?        S    04:59   0:00 [ksoftirqd
root          15  0.0  0.0      0     0 ?        I    04:59   0:05 [rcu_preem
root          16  0.0  0.0      0     0 ?        S    04:59   0:00 [migration
root          18  0.0  0.0      0     0 ?        S    04:59   0:00 [cpuhp/0]
root          19  0.0  0.0      0     0 ?        S    04:59   0:00 [cpuhp/1]
root          20  0.0  0.0      0     0 ?        S    04:59   0:00 [migration
root          21  0.0  0.0      0     0 ?        S    04:59   0:00 [ksoftirqd
root          23  0.0  0.0      0     0 ?        I<   04:59   0:00 [kworker/1
root          24  0.0  0.0      0     0 ?        S    04:59   0:00 [cpuhp/2]
root          25  0.0  0.0      0     0 ?        S    04:59   0:00 [migration
root          26  0.0  0.0      0     0 ?        S    04:59   0:00 [ksoftirqd
root          28  0.0  0.0      0     0 ?        I<   04:59   0:00 [kworker/2
```

- Use the "grep" command to filter the processes list and display only the processes with "bash" in their name.
  (used ‘pipe |’ to connect inputs and ouputs of the specified commands.

```
kali@kali: ~/Kamalesh
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh]
└─$ ps -ef | grep -i bash
kali       59131   39789  0 06:54 pts/0    00:00:00 grep --color=auto -i bash
```

Note:
I’ve tried ps commands with multiple options such as ’aux’, ’-e’, ’x’ etx. And no option let the ps command to display processes with name ’bash’
So, I executed anyway, and the ’grep’ command found only one match, which is the command that I used to search for bash itself.

- Use the "wc" command to count the number of lines in the filtered output.

```
kali@kali: ~/Kamalesh
File  Actions  Edit  View  Help

┌──(kali㉿kali)-[~/Kamalesh]
└─$ ps -ef | grep -i bash
kali       61383   39789  0 06:59 pts/0    00:00:00 grep --color=auto -i bash

┌──(kali㉿kali)-[~/Kamalesh]
└─$ ps -ef | grep -i bash | wc -l
1
```