



2021 Cyber Security Academy - MTU June 8th - 11th  
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# Linux command line

## Open linux terminal

- Press the “windows key” or “command key”
- Type “terminal”
- Open the Terminal Emulator

## Help page - **man**

- All linux commands can be looked up using the manual command.
- **\$ man commandname**

## Linux file structure

Print your working directory

- **\$ pwd**

List all files and directories (folders) in your working directory

- **\$ ls**

Change to a different directory

- **\$ cd directory**

Go to your home directory (home/student)

- **\$ cd ~**

Go back to parent directory

- **\$ cd ..**

Example output:

```
student@kali: /home
File Actions Edit View Help
(student@kali) - [~]
$ pwd
/home/student
(student@kali) - [~]
$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
(student@kali) - [~]
$ cd Documents/
(student@kali) - [~/Documents]
$ pwd
/home/student/Documents
(student@kali) - [~/Documents]
$ cd ~
(student@kali) - [~]
$ pwd
/home/student
(student@kali) - [~]
$ cd ..
(student@kali) - [/home]
$ pwd
/home
```



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### Creating and editing files

Make a directory

- `$ mkdir directoryname`

Create a file in that directory

- Change directory:
  - `$ cd directoryname`
- Then create the file using:
  - `$ touch filename.txt`
- (Or `$ touch directoryname/filename.txt` if we don't want to move into the directory)

Place text in the file

- `$ echo Hello World > filename.txt`
- To add more text to the file:
- `$ echo Hello World 2 >> filename.txt`
- Note that `>` will overwrite anything in the file whereas `>>` adds to the existing content.

View file

- `$ less filename.txt`
- Press “q” to exit `less`

Open file (view and edit)

- `$ subl filename.txt`

Remove file

- `$ rm -i filename`
- `-i` does a check before removal (type y when check appears)

Remove directory

- `$ rm -di directoryname`
- `-d` means remove directory

Example output:

```
(student@kali) - [~/Documents]
$ mkdir directoryname
(student@kali) - [~/Documents]
$ cd directoryname/
(student@kali) - [~/Documents/directoryname]
$ touch filename.txt
(student@kali) - [~/Documents/directoryname]
$ echo Hello World > filename.txt
(student@kali) - [~/Documents/directoryname]
$ echo Hello World 2 >> filename.txt
(student@kali) - [~/Documents/directoryname]
$ less filename.txt
(student@kali) - [~/Documents/directoryname]
$ subl filename.txt
(student@kali) - [~/Documents/directoryname]
$ ls
filename.txt
(student@kali) - [~/Documents/directoryname]
$ rm -i filename.txt
rm: remove regular file 'filename.txt'? y
(student@kali) - [~/Documents/directoryname]
$ ls
(student@kali) - [~/Documents/directoryname]
$ cd ..
(student@kali) - [~/Documents]
$ rm -di directoryname/
rm: remove directory 'directoryname/'? y
```



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### More file commands

#### Copy

- `$ cp filename1.txt filename2.txt`

#### Move

- Move filename2.txt to filename3.txt. Not, unlike cp, filename 2 will no longer exist.
- `$ mv filename2.txt filename3.txt`
- (We can also give file paths e.g. `$ mv filename2.txt ~/Documents/filename4.txt`)

#### Concatenate

- `$ cat filename1.txt filename3.txt`
- Joins two files together and then prints them to the screen.
- We can easily send the output to a new file using the ">" operator:
- `$ cat filename1.txt filename3.txt > filename4.txt`

#### Search

- `$ grep -i "Hello" filename4.txt`
- This searches for the word Hello in filename4.txt. -i means ignore case.
- To search through all files that begin with file and end with .txt:
- `$ grep -i "Hello" file*.txt`
- The output will indicate which file each result comes from.

#### Word count

- `$ wc filename1.txt`
- Prints the number of lines, word, and bytes in the file

#### Example output:

```
$ cp file1.txt file2.txt
(student@kali) - [~/Documents/directory]
$ mv file2.txt file3.txt
(student@kali) - [~/Documents/directory]
$ ls
file1.txt  file3.txt
(student@kali) - [~/Documents/directory]
$ cat file1.txt file3.txt
Hello World
Hello World 2
Hello World
Hello World 2
(student@kali) - [~/Documents/directory]
$ cat file1.txt file3.txt > file4.txt
(student@kali) - [~/Documents/directory]
$ grep -i "Hello" file4.txt
Hello World
Hello World 2
Hello World
Hello World 2
(student@kali) - [~/Documents/directory]
$ grep -i "Hello" file*.txt
file1.txt:Hello World
file1.txt:Hello World 2
file3.txt:Hello World
file3.txt:Hello World 2
file4.txt:Hello World
file4.txt:Hello World 2
file4.txt:Hello World
file4.txt:Hello World 2
(student@kali) - [~/Documents/directory]
$ wc file1.txt
 2  5 26 file1.txt
```



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### Combining commands

#### Piping

- We can pipe “|” the output from one command to another command.
- For example, if I want to count how many words are in all my files all of the them, I could first run `$ cat file*.txt` and then pipe the output to `wc`:
- `$ cat file* | wc`

#### Multiple commands

- Use `&&` to run a second command
  - `$ program1 && program2 && program3`
  - Note this will only run the next program in sequence if the previous one runs.
- If we want the next program to run, no matter the outcome of the previous one then we can use “;”
  - `$ program1 ; program2 ; program3`

Example output: Note that in “`$ cat file2.txt && wc file1.txt`” we never get a word count.

```
(student@kali) - [~/Documents/directory]
$ cat file* | wc
 8      20      104
(student@kali) - [~/Documents/directory]
$ cat file2.txt && wc file1.txt
cat: file2.txt: No such file or directory
(student@kali) - [~/Documents/directory]
$ cat file2.txt ; wc file1.txt
cat: file2.txt: No such file or directory
 2  5 26 file1.txt
```

### Variables

#### Create variable

- `$ export variable=4`
- This variable only exists in this terminal

#### View variable

- `$ echo $variable`

```
student@kali: ~/Documents
File Actions Edit View Help
(student@kali) - [~/Documents]
$ export variable=4
(student@kali) - [~/Documents]
$ echo $variable
4
(student@kali) - [~/Documents]
$
```



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### Tips

#### Tab completion

- If you begin typing a file or directory name press tab to autocomplete it.
- If there is only one option for autocompletion, it will choose this option
- If there are multiple options then it will display all options

#### Previously typed commands

- To re-run the same command again press the up arrows on your keyboard to load previously typed commands and press enter to execute.

#### Run processes in the background

- Type process with "&" at the end:
- \$ firefox &

#### Clear terminal screen

- \$ clear