Linux

Linux Course

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وزارة الاتصالات
وتكنولوجيا المعلومات

MANNING

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DAY 2 CONTENTS

- Directory Management Commands
- File Management Commands
- Switching to other accounts
- Shutting down the system

Get a list of files in a directory

- **pwd**

Print the name of your current working directory.

```
mostafa@mostafa-VirtualBox:~$ pwd
/home/mostafa
```

- **mkdir**

mkdir creates a new directory.

```
mostafa@mostafa-VirtualBox:~$ mkdir course
mostafa@mostafa-VirtualBox:~$ ls
Anaconda3-2022.05-MacOSX-arm64.sh  Desktop    Downloads  Pictures  snap                     Templates
course                             Documents  Music      Public    start-coding-immediately  Videos
```


Change your current working directory.

- **cd course**
  To get into the directory “**course**” directory, run the command below
- **pwd**
  Use the pwd command to verify if your current working directory has changed.
- **cd**
  If you use cd without any directory name, it will move you back to your home directory.
- **pwd**
  Use the pwd command to verify if your current working directory has changed.
- **cd ..**
  Run the command below to move to the parent directory. .. is a shortcut that refers to the parent directory of your current directory.

```
mostafa@mostafa-VirtualBox:~$ cd course/
mostafa@mostafa-VirtualBox:~/course$ pwd
/home/mostafa/course
mostafa@mostafa-VirtualBox:~/course$ cd
mostafa@mostafa-VirtualBox:~$ pwd
/home/mostafa
mostafa@mostafa-VirtualBox:~$ cd ..
mostafa@mostafa-VirtualBox:/home$
```


Get a list of files in a directory

- **ls**
  Lists the files in the current directory or the directory given as argument.
- **ls -l**
  Prints a long list of files that has additional information compared to the simple ls command.

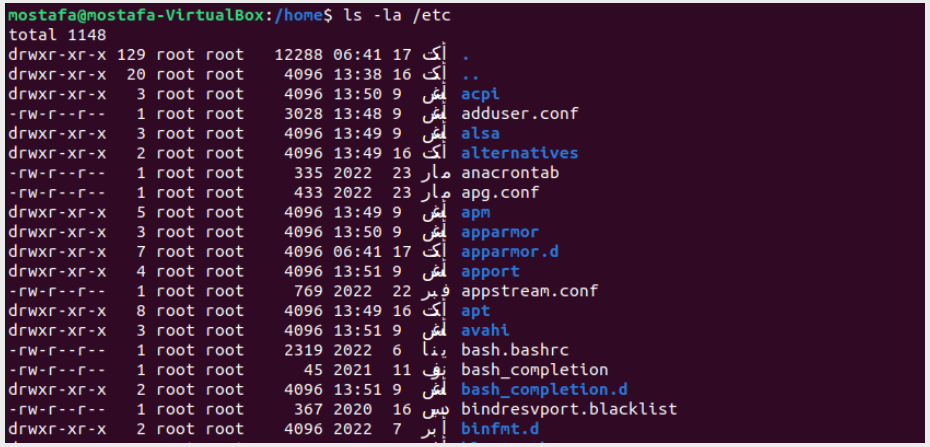
```
mostafa@mostafa-VirtualBox:/home$ ls
mostafa
mostafa@mostafa-VirtualBox:/home$ ls -l
total 4
drwxr-x--- 15 mostafa mostafa 4096 06:17 17 أك mostafa
```

Option	Description
-a	list all the files including hidden files
-d	list directories themselves, not their contents
-h	with -l and -s, print sizes like 1K, 234M, 2G etc
-l	long listing of files which include information about permission, owner, size etc
-F	classify files by appending type indcator like *,/ etc. to file names
-r	reverse order while sorting
-S	sort by file size, largest first
-t	sort by time, newest first

Get a list of files in a directory

- **ls -la /etc**

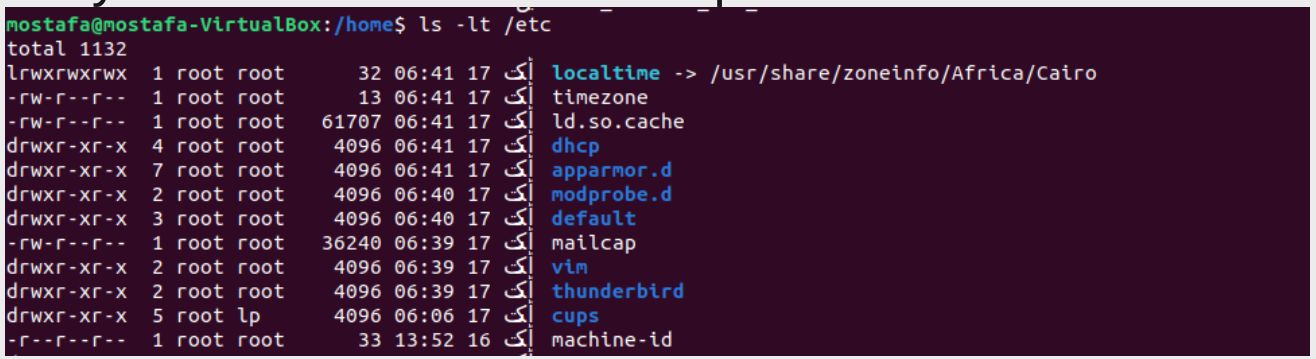
  Get a long listing of all files in /etc, including hidden files, if any.



- **ls -lt**

  To list the files based on modification time, use -t option.

  The most recently modified file will be on top.



Get a list of files in a directory

- **ls -ld /etc**

  To view the current directory attributes instead of their contents, use the following command. If you want any other directory's attributes, provide the directory name as argument.

```
mostafa@mostafa-VirtualBox:/home$ ls -ld /etc
drwxr-xr-x 129 root root 12288 06:41 17 أك  /etc
```

- **ls -ls**

  To list the files based on modification time, use -t option.

  The most recently modified file will be on top.

```
mostafa@mostafa-VirtualBox:/home$ ls -lS /etc
total 1132
-rw-r--r--  1 root root   72029 2022  21 مار mime.types
-rw-r--r--  1 root root   61707 06:41 17 أك ld.so.cache
-rw-r--r--  1 root root   36240 06:39 17 أك mailcap
-rw-r--r--  1 root root   29219 17:25 28 يون brltty.conf
-rw-r--r--  1 root root   12813 2021  28 مار services
-rw-r--r--  1 root root   11204 2022  9  فبر nanorc
-rw-r--r--  1 root root   10734 2021  11 نف login.defs
-rw-r--r--  1 root root   10593 2022  31 مار sensors3.conf
-rw-r--r--  1 root root    9454 13:38 16 أك locale.gen
-rw-r--r--  1 root root    9390 2022  14 فبر sudo_logsrvd.conf
-rw-r--r--  1 root root    7649 13:51 9  أغ pnm2ppa.conf
-rw-r--r--  1 root root    5620 2022  9  ينا rygel.conf
-rw-r--r--  1 root root    5529 13:48 9  أغ ca-certificates.conf
-rw-r--r--  1 root root    5217 2022  17 مار manpath.config
-rw-r--r--  1 root root    4942 2022  24 ينا wgetrc
-rw-r--r--  1 root root    4573 2022  14 فبر sudo.conf
-rw-r--r--  1 root root    4436 2020  16 ديس hdparm.conf
```


Get a list of files in a directory

- **ls -lrs**

  To get the files sorted by file size in ascending order, add -r option.

```
mostafa@mostafa-VirtualBox:/home$ ls -lrs /etc/
total 1132
 4 -rw-r--r--  1 root root     460 2021  8  يس zsh_command_not_found
 4 drwxr-xr-x  2 root root    4096 13:51 9  أغ xml
 4 drwxr-xr-x  6 root root    4096 13:49 9  أغ xdg
 4 -rw-r--r--  1 root root     681 2022  23 مار xattr.conf
 4 drwxr-xr-x 12 root root    4096 13:51 9  أغ X11
 4 drwxr-xr-x  2 root root    4096 13:51 9  أغ wpa_supplicant
 8 -rw-r--r--  1 root root    4942 2022  24 ينا wgetrc
 4 drwxr-xr-x  5 root root    4096 13:49 9  أغ vulkan
 0 lrwxrwxrwx  1 root root      23 13:32 16 أك vtrgb -> /etc/alternatives/vtrgb
 4 drwxr-xr-x  2 root root    4096 06:39 17 أك vim
 4 -rw-r--r--  1 root root      51 2020  9  أب vdpau_wrapper.cfg
 4 drwxr-xr-x  2 root root    4096 2021  6  سبت usb_modeswitch.d
 4 -rw-r--r--  1 root root    1523 2022  25 مار usb_modeswitch.conf
 4 drwxr-xr-x  2 root root    4096 13:50 9  أغ UPower
 4 drwxr-xr-x  2 root root    4096 2022  30 مار update-notifier
 4 drwxr-xr-x  2 root root    4096 13:51 9  أغ update-motd.d
 4 drwxr-xr-x  3 root root    4096 13:51 9  أغ update-manager
 4 drwxr-xr-x  3 root root    4096 13:51 9  أغ ufw
 4 drwxr-xr-x  2 root root    4096 13:51 9  أغ udisks2
 4 drwxr-xr-x  4 root root    4096 13:48 9  أغ udev
 4 -rw-r--r--  1 root root    1260 2020  16 يون ucf.conf
 4 drwxr-xr-x  2 root root    4096 13:48 9  أغ ubuntu-advantage
 4 drwxr-xr-x  2 root root    4096 2022  7  أب tmpfiles.d
 4 -rw-r--r--  1 root root      13 06:41 17 أك timezone
 4 drwxr-xr-x  2 root root    4096 06:39 17 أك thunderbird
 4 drwxr-xr-x  2 root root    4096 13:51 9  أغ thermald
 4 drwxr-xr-x  2 root root    4096 13:48 9  أغ terminfo
 4 drwxr-xr-x  5 root root    4096 13:50 9  أغ systemd
 4 drwxr-xr-x  2 root root    4096 13:48 9  أغ sysctl.d
```


Get a list of files in a directory

- **rmdir**

  rmdir removes a directory.

```
mostafa@mostafa-VirtualBox:~/Desktop$ ls
 mostafa.txt  'New Folder'
mostafa@mostafa-VirtualBox:~/Desktop$ rmdir New\ Folder/
mostafa@mostafa-VirtualBox:~/Desktop$ ls
mostafa.txt
```


Search and locate files

- **find**

  Find command is used to search for files in a directory. You can search for files based on different categories like file name, file type, owner, size, timestamps etc.

  Find command conducts the search in the entire directory tree starting from the directory name given.

  This command finds **all txt files** in the subfolders of the /etc directory.

```
ostafa@mostafa-VirtualBox:~/Desktop$ find /etc/ -name '*.txt'
ind: ‘/etc/cups/ssl’: Permission denied
etc/brltty/Input/vd/all.txt
etc/brltty/Input/ba/all.txt
etc/brltty/Input/tn/all.txt
etc/brltty/Input/no/all.txt
etc/brltty/Input/bd/all.txt
etc/brltty/Input/lt/all.txt
etc/brltty/Input/eu/all.txt
etc/brltty/Input/lb/all.txt
etc/brltty/Input/bl/40_m20_m40.txt
etc/brltty/Input/bl/18.txt
etc/brltty/Input/vr/all.txt
etc/brltty/Input/mn/all.txt
etc/brltty/Input/mb/all.txt
etc/brltty/Input/vs/all.txt
etc/brltty/Input/tt/all.txt
etc/brltty/Input/ec/spanish.txt
etc/brltty/Input/ec/all.txt
```


Display the amount of disk space available on file systems

- **df**

  The “df” command displays the information of device name, total blocks, total disk space, used disk space, available disk space and mount points on a file system.

  Use the -h option to view the disk space usage in human readable format, i.e, in megabytes, gigabytes etc.

```
mostafa@mostafa-VirtualBox:~/Desktop$ df
Filesystem     1K-blocks     Used Available Use% Mounted on
tmpfs             202348     1576    200772   1% /run
/dev/sda3       25106692 12295620  11510388  52% /
tmpfs            1011728        0   1011728   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
/dev/sda2         524252     5364    518888   2% /boot/efi
tmpfs             202344     2412    199932   2% /run/user/1000
mostafa@mostafa-VirtualBox:~/Desktop$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           198M  1.6M  197M   1% /run
/dev/sda3        24G   12G   11G  52% /
tmpfs           989M     0  989M   0% /dev/shm
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
/dev/sda2       512M  5.3M  507M   2% /boot/efi
tmpfs           198M  2.4M  196M   2% /run/user/1000
```


File Management Commands

- **cat**

The following command prints the content of the file **“ourcourse.txt”** which you have downloaded earlier.

```
mostafa@mostafa-VirtualBox:~/Desktop$ cat ourcourse.txt
Wikis are enabled by wiki software, otherwise known as wiki engines. A wiki engine, being a form of a content manageme
nt system, differs from other web-based systems such as blog software, in that the content is created without any defi
ned owner or leader, and wikis have little inherent structure, allowing structure to emerge according to the needs of
the users.[1] Wiki engines usually allow content to be written using a simplified markup language and sometimes edited
 with the help of a rich-text editor.[2] There are dozens of different wiki engines in use, both standalone and part o
f other software, such as bug tracking systems. Some wiki engines are open-source, whereas others are proprietary. Som
e permit control over different functions (levels of access); for example, editing rights may permit changing, adding,
 or removing material. Others may permit access without enforcing access control. Other rules may be imposed to organi
ze content.

The online encyclopedia project, Wikipedia, is the most popular wiki-based website, and is one of the most widely view
ed sites in the world, having been ranked in the top twenty since 2007.[3] Wikipedia is not a single wiki but rather a
 collection of hundreds of wikis, with each one pertaining to a specific language. In addition to Wikipedia, there are
 hundreds of thousands of other wikis in use, both public and private, including wikis functioning as knowledge manage
ment resources, note-taking tools, community websites, and intranets. The English-language Wikipedia has the largest c
ollection of articles: as of February 2020, it has over 6 million articles. Ward Cunningham, the developer of the firs
t wiki software, WikiWikiWeb, originally described wiki as "the simplest online database that could possibly work."[4]
 "Wiki" (pronounced [wiki][note 1]) is a Hawaiian word meaning "quick.
```


Display file contents page-wise

- **more**

The more command displays the file contents page by page.

```
mostafa@mostafa-VirtualBox:~/Desktop$ more ourcourse.txt
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are, WikiWikiWeb, originally described wiki as "the simplest online database tha
--More--(27%)
```


Display first few lines of a file

- **head**

Print the first 10 lines of the file “ourcourse.txt”.

```
nostafa@mostafa-VirtualBox:~/Desktop$ head ourcourse.txt
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 "Wiki" (pronounced [wiki][note 1]) is a Hawaiian word meaning "quick.

In their book The Wiki Way: Quick Collaboration on the Web, Ward Cunningham and co-author Bo Leuf described the essenc
e of the Wiki concept:[8][9][page needed]
```


Display first few lines of a file

- **head -3 filename.txt**

Print the first 3 lines of the file “ourcourse.txt”.

```
mostafa@mostafa-VirtualBox:~/Desktop$ head -3 ourcourse.txt
Wikis are enabled by wiki software, otherwise known as wiki engines. A wiki engine, being a form of a content manageme
nt system, differs from other web-based systems such as blog software, in that the content is created without any defi
ned owner or leader, and wikis have little inherent structure, allowing structure to emerge according to the needs of
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 "Wiki" (pronounced [wiki][note 1]) is a Hawaiian word meaning "quick.
```


Display last lines of a file

- **tail filename.txt**

Print the last 10 lines of the file ourcourse.txt.

```
mostafa@mostafa-VirtualBox:~/Desktop$ tail ourcourse.txt
Hello in line 1
Hello in line 2
Hello in line 3
Hello in line 4
Hello in line 5
Hello in line 6
Hello in line 7
Hello in line 8
Hello in line 9
Hello in line 10
```

- **tail -3 filename.txt**

Print the last 3 lines of the file “ourcourse.txt”.

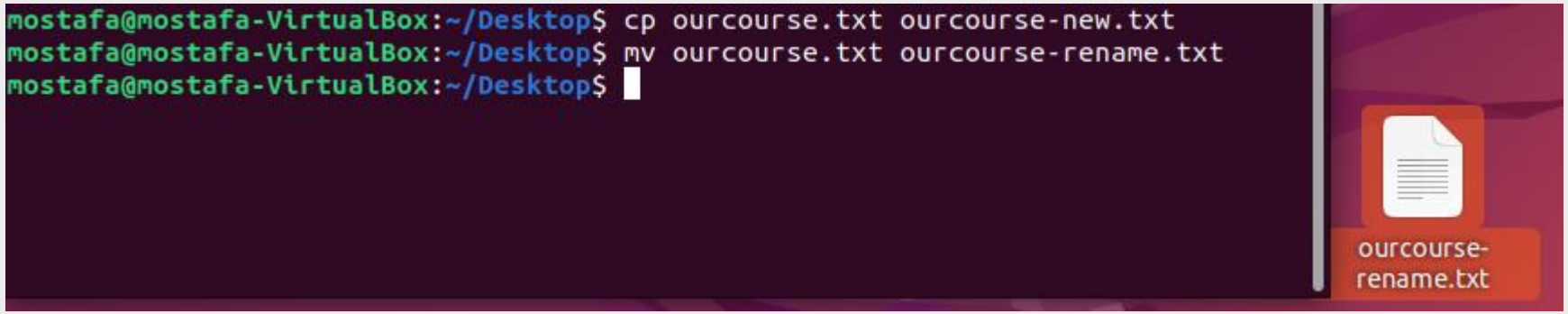
```
mostafa@mostafa-VirtualBox:~/Desktop$ tail -3 ourcourse.txt
Hello in line 8
Hello in line 9
Hello in line 10
```


Copy files

- **cp ourcourse.txt ourcourse-new.txt**
  Copy ourcourse.txt into a file named ourcourse-new.txt
  Note: don’t need to create "ourcourse-new.txt" this file will be created automatically

```
mostafa@mostafa-VirtualBox:~/Desktop$ cp ourcourse.txt ourcourse-new.txt
```

- **mv ourcourse.txt ourcourse-rename.txt**
  If the source and target directories are same, it works like rename operation



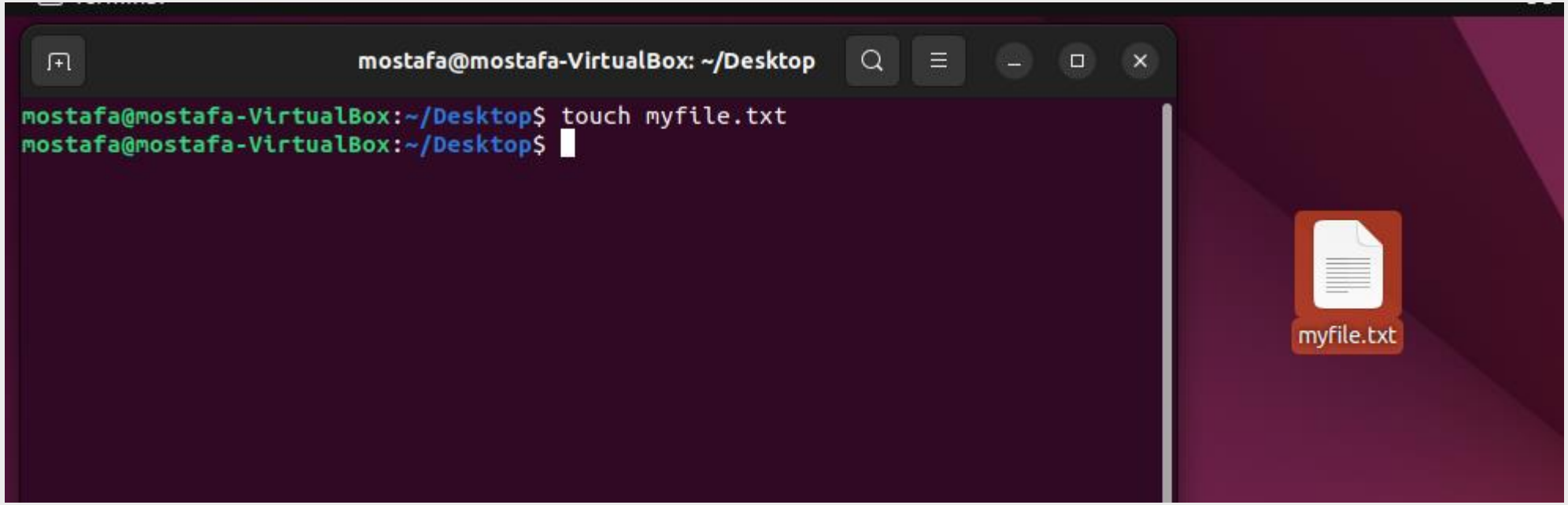
- **mv user-info.txt /tmp**
  Move user-info.txt to the /tmp directory

Create a blank file

- **touch myfile.txt**

  Create an empty file named myfile.txt

  If the file already exists, the touch command updates the access timestamp of the file.

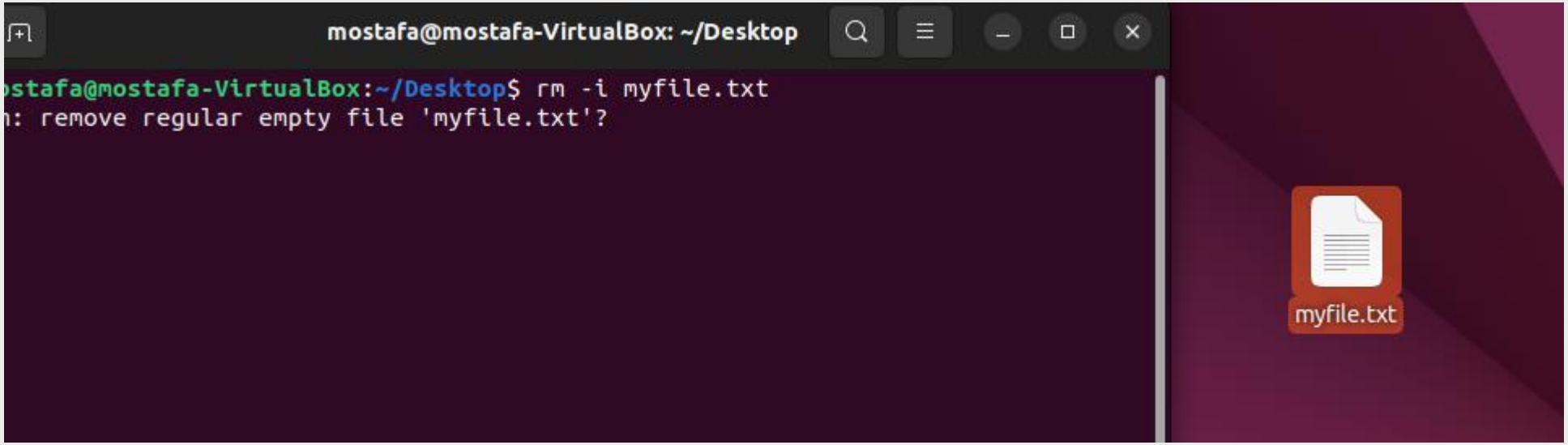


Remove files

- **rm -i myfile.txt**

  The rm command is ideally used along with the -i option, which makes it ask for confirmation before deleting.

  Remove the file myfile.txt. Press y to confirm deletion, or n to cancel



Create and manage file archives

- **tar**

  tar command allows you to copy multiple files and directories into a single archive file.

  The following command creates an archive of the entire '/bin' directory into a file named bin.tar.

Option	Description
-c	Create new archive file
-v	Verbosely list files processed (display detailed information).
-f	Archive file name

- **tar -cvf filename folder/**

```
mostafa@mostafa-VirtualBox:~$ tar -cvf bin.tar Downloads/
Downloads/
Downloads/wget-1.21.3-hc6d1d07_0.tar.bz2
mostafa@mostafa-VirtualBox:~$
```


Package and compress archive files

- **zip**

  The following command creates a zip named “anaconda.zip”

```
mostafa@mostafa-VirtualBox:~$ zip anaconda.zip Downloads/
  adding: Downloads/ (stored 0%)
```

- **zip -r bin.zip /bin**

  The -r option can be used to zip the entire folder.

```
mostafa@mostafa-VirtualBox:~$ zip -r anaconda.zip Downloads/
updating: Downloads/ (stored 0%)
  adding: Downloads/wget-1.21.3-hc6d1d07_0.tar.bz2 (deflated 0%)
```


Extract, list, or test compressed files in a ZIP archive

- **unzip –l anaconda.zip**

  The following command lists the files of the archive called “anaconda.zip”

```
mostafa@mostafa-VirtualBox:~$ unzip -l anaconda.zip
Archive:  anaconda.zip
  Length      Date    Time    Name
---------  ---------- -----   ----
        0  2022-10-17 03:05   Downloads/
   357176  2022-10-17 03:05   Downloads/wget-1.21.3-hc6d1d07_0.tar.bz2
---------                     -------
   357176                     2 files
```

- **unzip anaconda.zip**

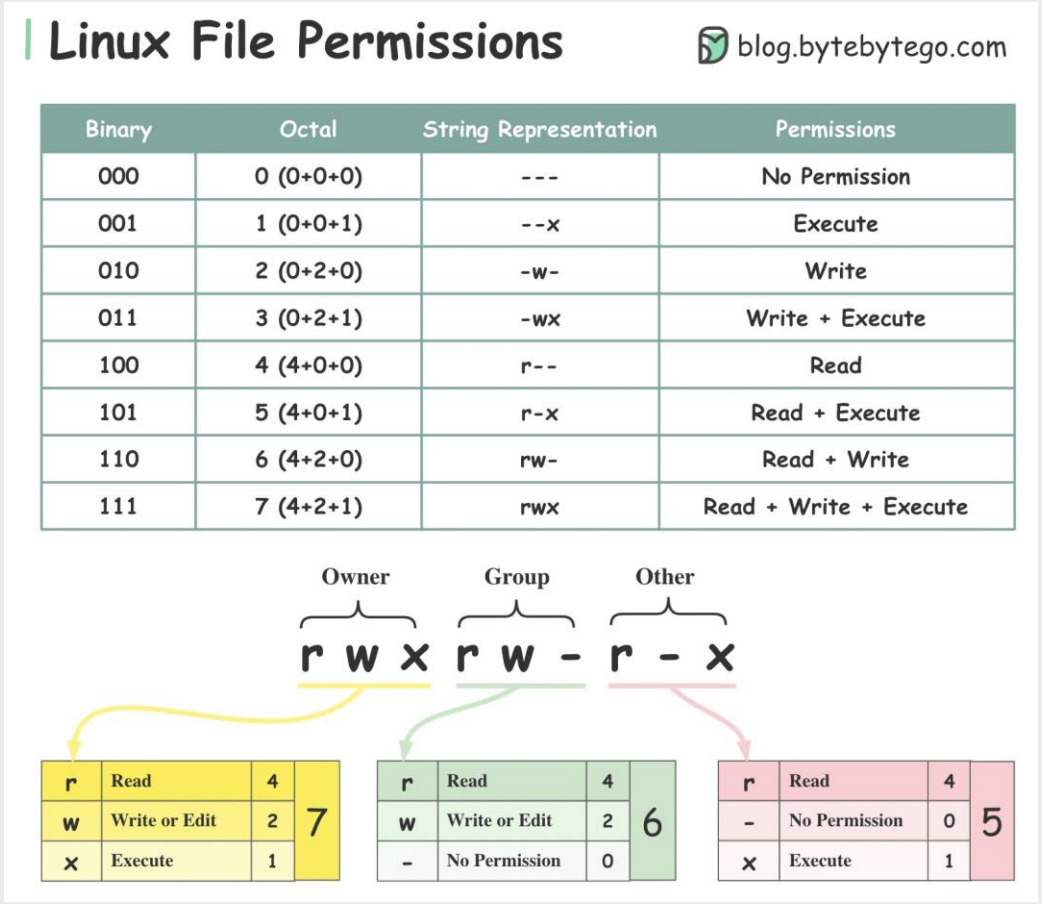
  The following command extracts all the files in the archive “anaconda.zip”

```
mostafa@mostafa-VirtualBox:~/Desktop$ unzip anaconda.zip
Archive:  anaconda.zip
   creating: Downloads/
  inflating: Downloads/wget-1.21.3-hc6d1d07_0.tar.bz2
```


Access Control Commands

- Each file/directory has permissions set for the file owner, group owner and others.

The following permissions are set for each file:



Binary	Octal	String Representation	Permissions
000	0 (0+0+0)	---	No Permission
001	1 (0+0+1)	--x	Execute
010	2 (0+2+0)	-w-	Write
011	3 (0+2+1)	-wx	Write + Execute
100	4 (4+0+0)	r--	Read
101	5 (4+0+1)	r-x	Read + Execute
110	6 (4+2+0)	rw-	Read + Write
111	7 (4+2+1)	rwx	Read + Write + Execute

Permissions

- **chmod -r ourcourse-new.txt**

  The command below removes read permission for all (user,group and other) on usdoi.txt.

- **chmod +r ourcourse-new.txt**

  Add read access to all on usdoi.txt.

- **chmod o-r ourcourse-new.txt**

  To remove the read permission for 'others' category.

```
mostafa@mostafa-VirtualBox:~/Desktop$ chmod o-r ourcourse-new.txt
mostafa@mostafa-VirtualBox:~/Desktop$ ls -l ourcourse-new.txt
--w--w---- 1 mostafa mostafa 161 10:49 17 أكت ourcourse-new.txt
```


Text Processing Commands

- **wc**

  If you want to find the number of lines, words and characters in a file, for example “ourcourse.txt”.

```
mostafa@mostafa-VirtualBox:~/Desktop$ sudo wc ourcourse-new.txt
 10  40 161 ourcourse-new.txt
```

- **wc –l ourcourse-new.txt**
  - **Print only the number of lines in “ourcourse-new.txt”.**
- **wc -w ourcourse-new.txt**

  Print only the number of words in “ourcourse-new.txt”.
- **wc -c ourcourse-new.txt**

  Print only the number of characters in “ourcourse-new.txt”.

```
mostafa@mostafa-VirtualBox:~/Desktop$ sudo wc -l ourcourse-new.txt
10 ourcourse-new.txt
mostafa@mostafa-VirtualBox:~/Desktop$ sudo wc -w ourcourse-new.txt
40 ourcourse-new.txt
mostafa@mostafa-VirtualBox:~/Desktop$ sudo wc -c ourcourse-new.txt
161 ourcourse-new.txt
```


Perform search operations within the text

- **grep**

  grep command allows you to specify patterns and search for lines matching the pattern, from the input text.

- **grep people ourcourse-new.txt**

  The following command prints all lines in the file ourcourse-new.txt which contain the word “Hello”.

```
mostafa@mostafa-VirtualBox:~/Desktop$ sudo grep Hello  ourcourse-new.txt
Hello in line 1
Hello in line 2
Hello in line 3
Hello in line 4
Hello in line 5
Hello in line 6
Hello in line 7
Hello in line 8
Hello in line 9
Hello in line 10
```

Option	Description.
-n	Along with the matching lines, print the line numbers also
-c	Get the count of matching lines
-i	Ignore the case of the text while matching
-v	Print all lines which do not contain the pattern
-w	Match only if the pattern matches whole words

Perform search operations within the text

- **grep -v one ourcourse-new.txt**

```
mostafa@mostafa-VirtualBox:~/Desktop$ grep -v one ourcoruse-rename.txt
Hello in line two
Hello in line three
```

Option	Description.
-n	Along with the matching lines, print the line numbers also
-c	Get the count of matching lines
-i	Ignore the case of the text while matching
-v	Print all lines which do not contain the pattern
-w	Match only if the pattern matches whole words

Networking commands

- **hostname**
  Show the system's host name

```
mostafa@mostafa-VirtualBox:~/Desktop$ hostname
mostafa-VirtualBox
```

- **hostname -i**
  You can use the -i option to view the IP address of the host:

```
mostafa@mostafa-VirtualBox:~/Desktop$ hostname -i
127.0.1.1
```


Test if a host is reachable

- **ping**
  Check if “**www.google.com**” is reachable. The command keeps sending data packets to the “**www.google.com**” server and prints the response it gets back. (Press Ctrl+C to stop pinging)

```
ostafa@mostafa-VirtualBox:~/Desktop$ ping google.com
PING google.com (172.217.171.238) 56(84) bytes of data.
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=1 ttl=109 ti
me=71.9 ms
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=2 ttl=109 ti
me=72.3 ms
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=3 ttl=109 ti
me=72.1 ms
```

- **ping -c 5 www.google.com**
  If you want to ping only for a limited number of times, use -c option.

```
ostafa@mostafa-VirtualBox:~/Desktop$ ping -c 5 google.com
PING google.com (172.217.171.238) 56(84) bytes of data.
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=1 ttl=109 ti
me=72.3 ms
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=2 ttl=109 ti
me=71.8 ms
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=3 ttl=109 ti
me=72.7 ms
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=4 ttl=109 ti
me=72.3 ms
64 bytes from mrs09s07-in-f14.1e100.net (172.217.171.238): icmp_seq=5 ttl=109 ti
me=71.0 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
tt min/avg/max/mdev = 70.992/72.000/72.679/0.578 ms
```


Display network interface configuration ifconfig

- **ifconfig**
  Display the configuration of all network interfaces of the system:

```
mostafa@mostafa-VirtualBox:~/Desktop$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::53bd:d46d:298d:72e3  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:42:37:4b  txqueuelen 1000  (Ethernet)
        RX packets 265086  bytes 370910543 (370.9 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 44969  bytes 3881915 (3.8 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 5934  bytes 673031 (673.0 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 5934  bytes 673031 (673.0 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```


Transfer data from or to a server

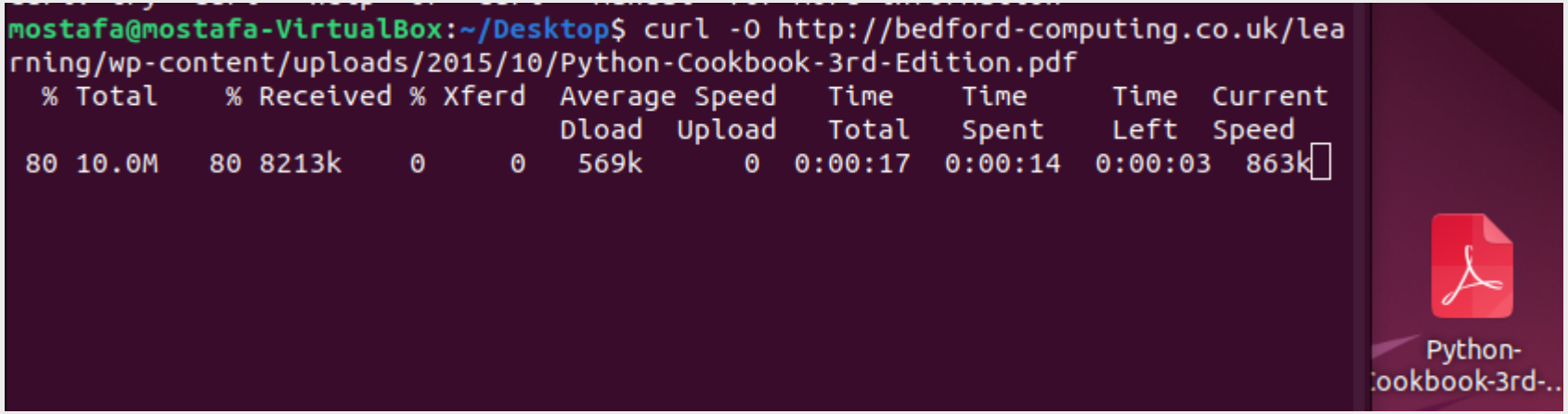
- **curl**
  Access the file at the given URL and display the contents on to the screen.

```
ostafa@mostafa-VirtualBox:~/Desktop$ curl http://bedford-computing.co.uk/learni
g/wp-content/uploads/2015/10/Python-Cookbook-3rd-Edition.pdf
PDF-1.4
%%%%
 0 obj
<<
/BleedBox [ 0 0 595.276 841.89 ]
/Count 706
/CropBox [ 0 0 595.276 841.89 ]
/Kids [ 2 0 R 11236 0 R ]
/MediaBox [ 0 0 595.276 841.89 ]
/Type /Pages
>>
endobj
 0 obj
```


Transfer data from or to a server

- **curl –o**

  Access the file at the given URL and save it in the current directory.




Thank
you