

Linux Introduction

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Enabler for Life Sciences

Linux Introduction

Look up the links from Pre-course material, use Google, and ...

Practice makes perfect :)

Enabler for Life Sciences

- **Paralleldatorcentrum**
<http://www.pdc.kth.se>
(KTH:s supercomputer center)
- 1 computer cluster, **Dardel**
- Uses Linux

- Why Linux?

- A powerful command-line interface
- Built for multi-user systems.
- An enormous amount of software is freely available

The screenshot shows a Linux desktop environment. On the left, there are application icons for Steam, HeroicGa..., and Roblox. In the center, a terminal window is open, displaying Python code for testing a web API. The code includes imports for requests, xml.etree.ElementTree, and dotenv, followed by environment variable loading and conditional checks for host, user, and password. The file manager window on the right shows a directory tree for 'testarea' with various folders and their contents.

```

1 |
2 | Test script for Efecte WebAPI
3 | '''
4 |
5 | import requests
6 | import xml.etree.ElementTree as ET
7 | from dotenv import load_dotenv
8 | import os
9 |
10 | # Load environment
11 | load_dotenv()
12 |
13 | # Load config
14 | esm_host = os.environ.get('ESM_HOS')
15 | esm_user = os.environ.get('ESM_USE')
16 | esm_password = os.environ.get('ESM_
17 |
18 | if esm_host is None:
19 |     print("No host specified")
20 |     exit()
21 | elif esm_user is None:
22 |     print("No user specified")
23 |     exit()
24 | elif esm_password is None:
25 |     print("No password specified")
26 |     exit()
27 |
28 | urlBase = "https://" + esm_host +
29 |
"edgeAPITest.py" 67L, 1600B | 1
    
```

Computer	Name	Size	Type
dahlo	1MB438	20 items	Folder
Desktop	ADBFforwarder	2 items	Folder
File System	asus_wmi	5 items	Folder
Downloads	audiobook-chapter-spl...	3 items	Folder
Trash	benchmark_disk	1 item	Folder
Devices	bjornlunden_docume...	11 items	Folder
499 GB Volume	bokadirekt-watcher	9 items	Folder
Bookmarks	btrfs_find_corrupted_...	1 item	Folder
torrent	ceph-kvm-cluster	2 items	Folder
dahlo-lunar (tail...	confluence-server-to...	24 items	Folder
Network	courses	1 item	Folder
Browse Network	cuda	5 items	Folder
	dineros	2 items	Folder
	edge2redmine	3 items	Folder
	forbok-cli	11 items	Folder
	hertz-config	11 items	Folder
	imei	11 items	Folder
	it87	13 items	Folder
	john	1 item	Folder
	john-jumbo	7 items	Folder
	leodium-ReLive-NoMa...	20 items	Folder
	mattias	4 items	Folder
	maya	2 items	Folder
	mimir	1 item	Folder
	mimir2librechat	7 items	Folder
	ml	6 items	Folder
	modorganizer2-linux-i...	13 items	Folder
	nbfc-linux	31 items	Folder
	nms	3 items	Folder

53 items, Free space: 469,8 GB

The screenshot shows a web browser displaying the homepage of Upsala Nya Tidning. The page features a navigation bar with 'Prenumerera' and 'Logga in' buttons. Below the navigation, there are two news snippets: 'JUST NU Slask' and 'JUST NU Jordbävning i Värmland'. The main article is titled 'Lagkompisen drabbades av allvarlig sjukdom – nu agerar hela laget' and includes a sub-headline: '> "Ville göra något ytterligare" ✓ Vill rädda andra - så ska det gå till'. The article is categorized as 'Innebandy' and has 21 likes. At the bottom, there is a 'Psst... Lyssna istället för att läsa!' notification and a navigation bar with 'Startsida', 'Senaste nytt', 'Toppryheter', and 'Innehåll' buttons.

```

File Edit View Terminal Tabs Help
drwxrwxr-x 1 dahlo dahlo 1,5K 15 mar 2024 confluence-server-to-cloud-utils
drwxr-xr-x 1 dahlo dahlo 12 5 sep 09.32 courses
drwxr-xr-x 1 dahlo dahlo 56 11 feb 2024 cuda
drwxr-xr-x 1 dahlo dahlo 84 1 feb 2024 dineros
drwxrwxr-x 1 dahlo dahlo 164 17 apr 2024 edge2redmine
drwxrwxr-x 1 dahlo dahlo 248 25 apr 2024 forbok-cli
drwxr-xr-x 1 dahlo dahlo 486 31 jan 2024 hertz-config
drwxrwxr-x 1 dahlo dahlo 364 9 feb 2024 imei
drwxrwxr-x 1 dahlo dahlo 316 13 feb 2024 it87
drwxrwxr-x 1 dahlo dahlo 18 28 maj 09.32 john
drwxrwxr-x 1 dahlo dahlo 316 28 maj 09.28 john-jumbo
drwxr-xr-x 1 dahlo dahlo 1,1K 29 okt 22.37 leodium-Relive-NoMansSky-Expeditions-Offline
drwxrwxr-x 1 dahlo dahlo 72 21 mar 2024 mattias
drwxr-xr-x 1 dahlo dahlo 32 5 sep 10.32 maya
drwxrwxr-x 1 dahlo dahlo 16 1 mar 2024 mimir
drwxrwxr-x 1 dahlo dahlo 242 16 apr 2024 mimir2librechat
drwxr-xr-x 1 dahlo dahlo 66 31 jan 2024 ml
drwxr-xr-x 1 dahlo dahlo 286 1 okt 12.24 modorganizer2-linux-installer
drwxrwxr-x 1 dahlo dahlo 600 11 mar 2024 nbfc-linux
drwxr-xr-x 1 dahlo dahlo 76 25 sep 23.25 nms
drwxr-xr-x 1 dahlo dahlo 43K 31 jan 2024 poloniex_data
drwxr-xr-x 1 dahlo dahlo 458 30 aug 15.30 POL-POM-4
drwxr-xr-x 1 dahlo dahlo 750 30 aug 15.45 POL-POM-5
drwxrwxr-x 1 dahlo dahlo 42 22 aug 11.36 remove_old_kernels
drwxrwxr-x 1 dahlo dahlo 140 26 feb 2024 roy
drwxr-xr-x 1 dahlo dahlo 72 19 feb 2024 sink_switcher
drwxrwxr-x 1 dahlo dahlo 148 5 apr 2024 straip_utils
drwxrwxr-x 1 dahlo dahlo 44 18 jun 23.02 syncting
drwxrwxr-x 1 dahlo dahlo 136 24 nov 21.39 temp
drwxrwxr-x 1 dahlo dahlo 210 14 aug 09.45 timelog-bot
drwxr-xr-x 1 dahlo dahlo 120 31 jan 2024 tsai
drwxr-xr-x 1 dahlo dahlo 448 15 okt 11.59 UPPMAX-documentation
drwxrwxr-x 1 dahlo dahlo 56 6 feb 2024 venv
drwxrwxr-x 1 dahlo dahlo 216 21 mar 2024 weather
drwxrwxr-x 1 dahlo dahlo 538 24 nov 21.26 workshop-ngsintro
drwxr-xr-x 1 dahlo dahlo 214 15 okt 14.39 xferticket-python
drwxr-xr-x 1 dahlo dahlo 222 27 aug 10.04 xone
drwxrwxr-x 1 dahlo dahlo 318 20 aug 22.09 xpadneo
-rw-r--r-- 1 dahlo dahlo 23M 19 nov 13.39 bokadirekt-watcher.tar.gz
-rw-rw-r-- 1 dahlo dahlo 2,1K 24 maj 2024 timelogbot_v2_prompt.txt
[21:39:58] dahlo@dahlo-home ~/testarea $ uptime
21:40:44 up 12:57, 2 users, load average: 0,27, 0,43, 0,41
[21:40:44] dahlo@dahlo-home ~/testarea $ who
dahlo    tty7          2024-11-24 09:43 (:0)
[21:40:47] dahlo@dahlo-home ~/testarea $

```



Directory tree

Name	Size	Type	Date Modified
+ annotations		-- folder	2011-05-18 15:34:34
- annovar		-- folder	2011-05-18 15:34:31
+ annovarFiles		-- folder	2011-05-18 15:34:05
+ compare		-- folder	2011-05-18 15:34:29
+ prepStat		-- folder	2011-05-18 15:34:29
+ statFiles		-- folder	2011-05-18 15:34:06
- summarizePerGene		-- folder	2011-05-18 15:34:31
- data		-- folder	2011-05-18 15:34:31
01 1.0 1.annovar	1.4 MB	unknown	2011-05-18 15:34:30
1.annovar.alleleFreq.pdf	895 bytes	PDF document	2011-05-18 15:34:30
01 1.0 1.annovar.exonic_variant_function	242.9 KB	unknown	2011-05-18 15:34:30
01 1.0 1.annovar.hg19_snp131_dropped	837.2 KB	unknown	2011-05-18 15:34:30
01 1.0 1.annovar.hg19_snp131_filtered	905.6 KB	unknown	2011-05-18 15:34:30
ABC 1.annovar.log	725 bytes	application log	2011-05-18 15:34:30
01 1.0 1.annovar.stat	938 bytes	unknown	2011-05-18 15:34:30
01 1.0 1.annovar.variant_function	2.3 MB	unknown	2011-05-18 15:34:31
01 1.0 1.non_sym_gene_list	94.3 KB	unknown	2011-05-18 15:34:31
01 1.0 1.non_sym_gene_list_not_in_dbsnp	78.8 KB	unknown	2011-05-18 15:34:31
01 1.0 1.stop_gain_gene_list	4.4 KB	unknown	2011-05-18 15:34:31
01 1.0 1.stop_gain_gene_list_not_in_dbsnp	4.3 KB	unknown	2011-05-18 15:34:31
01 1.0 1.sym_gene_list	51.4 KB	unknown	2011-05-18 15:34:31
01 1.0 1.sym_gene_list_not_in_dbsnp	34.3 KB	unknown	2011-05-18 15:34:31
ABC test.out	2.7 MB	out document	2011-05-18 15:34:31
01 1.0 all.plot	500 bytes	unknown	2011-05-18 15:34:30
summary.ods	23.2 KB	OpenDocument Spreadsheet	2011-05-18 15:34:31


Navigation Commands

- **ls** – list the content of a directory

Navigation Commands







- **ls** – list the content of a directory

```
[dahlo@kalkyl4 dir]$
```

Name	Size	Type	Date Modified
 dir		-- folder	2012-01-05 13:44:47







- **ls** – list the content of a directory

```
[dahlo@kalkyl4 dir]$ ls
anotherFile.doc  directory1  file1.txt  file2.old  secondDirectory
```

Name	Size	Type	Date Modified
 dir		-- folder	2012-01-05 13:44:47
 directory1		-- folder	2012-01-05 13:45:43
 secondDirectory		-- folder	2012-01-05 13:46:21
 anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
 file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
 file2.old	2.2 KB	backup file	2012-01-05 13:44:33







- **ls** – list the content of a directory

```
[dahlo@kalkyl4 dir]$ ls -l
total 192
-rw-r--r-- 1 dahlo uppmx 28214 Jan  5 13:44 anotherFile.doc
drwxr-xr-x 2 dahlo uppmx  4096 Jan  5 13:45 directory1
-rw-r--r-- 1 dahlo uppmx 36458 Jan  5 13:44 file1.txt
-rw-r--r-- 1 dahlo uppmx  2273 Jan  5 13:44 file2.old
drwxr-xr-x 2 dahlo uppmx  4096 Jan  5 13:46 secondDirectory
```

Name	Size	Type	Date Modified
 dir		-- folder	2012-01-05 13:44:47
 directory1		-- folder	2012-01-05 13:45:43
 secondDirectory		-- folder	2012-01-05 13:46:21
 anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
 file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
 file2.old	2.2 KB	backup file	2012-01-05 13:44:33

- **ls** – list the content of a directory

```
[dahlo@kalkyl4 dir]$ ls -l
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-rw-r--r-- 1 dahlo uppmx  2273 Jan  5 13:44 file2.old
drwxr-xr-x 2 dahlo uppmx  4096 Jan  5 13:46 secondDirectory
```

Name	Size	Type	Date Modified
 dir		-- folder	2012-01-05 13:44:47
 directory1		-- folder	2012-01-05 13:45:43
 secondDirectory		-- folder	2012-01-05 13:46:21
 anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
 file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
 file2.old	2.2 KB	backup file	2012-01-05 13:44:33

Navigation Commands

- **cd – change working directory**
 - `cd <directory name> = down`
 - `cd .. = up`

```
[dahlo@kalkyl4 dir]$ cd directory1
[dahlo@kalkyl4 directory1]$
```

Name	Size	Type	Date Modified
dir	--	folder	2012-01-05 13:44:47
directory1	--	folder	2012-01-05 13:45:43
secondDirectory	--	folder	2012-01-05 13:46:21
anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
file2.old	2.2 KB	backup file	2012-01-05 13:44:33

Navigation Commands

- **cd** – change working directory
 - `cd <directory name>` = down
 - `cd ..` = up

```
[dahlo@kalkyl4 dir]$ cd directory1
[dahlo@kalkyl4 directory1]$ ls -l
total 184
-rw-r--r-- 1 dahlo uppmax 56427 Jan  5 13:45 notes
-rw-r--r-- 1 dahlo uppmax 25301 Jan  5 13:45 test.txt
```

Name	Size	Type	Date Modified
dir	--	folder	2012-01-05 13:44:47
directory1	--	folder	2012-01-05 13:45:43
notes	55.1 KB	unknown	2012-01-05 13:45:43
test.txt	24.7 KB	plain text document	2012-01-05 13:45:26
secondDirectory	--	folder	2012-01-05 13:46:21
anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
file2.old	2.2 KB	backup file	2012-01-05 13:44:33

Navigation Commands

- **cd – change working directory**
 - `cd <directory name>` = down
 - `cd ..` = up

```
[dahlo@kalkyl4 directory1]$ cd ../secondDirectory
[dahlo@kalkyl4 secondDirectory]$ ls -l
total 252
-rw-r--r-- 1 dahlo uppmx 28214 Jan  5 13:46 bird.jpg
-rw-r--r-- 1 dahlo uppmx 112853 Jan  5 13:46 tree.jpg
```

Name	Size	Type	Date Modified
dir	--	folder	2012-01-05 13:44:47
directory1	--	folder	2012-01-05 13:45:43
secondDirectory	--	folder	2012-01-05 13:46:21
bird.jpg	27.6 KB	JPEG Image	2012-01-05 13:46:21
tree.jpg	110.2 KB	JPEG Image	2012-01-05 13:46:09
anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
file2.old	2.2 KB	backup file	2012-01-05 13:44:33

Navigation Commands

- **cd** – change working directory
 - `cd <directory name>` = down
 - `cd ..` = up

```
[dahlo@kalkyl4 secondDirectory]$ ls -l ../directory1/
total 184
-rw-r--r-- 1 dahlo uppmx 56427 Jan  5 13:45 notes
-rw-r--r-- 1 dahlo uppmx 25301 Jan  5 13:45 test.txt
```

Name	Size	Type	Date Modified
dir	--	folder	2012-01-05 13:44:47
directory1	--	folder	2012-01-05 13:45:43
notes	55.1 KB	unknown	2012-01-05 13:45:43
test.txt	24.7 KB	plain text document	2012-01-05 13:45:26
secondDirectory	--	folder	2012-01-05 13:46:21
anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
file2.old	2.2 KB	backup file	2012-01-05 13:44:33

- **pwd** – print working directory

```
[dahlo@kalkyl4 dir]$ pwd  
/home/dahlo/glob/work/testarea/temp/dir
```


- **pwd** – print working directory

```
[dahlo@kalkyl4 dir]$ pwd  
/home/dahlo/glob/work/testarea/temp/dir
```

```
[dahlo@kalkyl4 dir]$ cd directory1/
```

```
[dahlo@kalkyl4 directory1]$ pwd  
/home/dahlo/glob/work/testarea/temp/dir/directory1
```

- Absolute paths
 - Starts with a /
 - Defined from the root of the file system

`/home/dahlo/documents/results.csv`

`/proj/g2019031/nobackup/`

- Absolute paths
 - Starts with a /
 - Defined from the root of the file system

`/home/dahlo/documents/results.csv`

`/proj/g2019031/nobackup/`

- Like an address
`Husargatan 3, Uppsala, Sweden`

- Relative paths
 - Does not start with a /
 - Relative to where you are when using it

```
../documents/results.csv
```

```
nobackup/dahlo/linux_intro/files.zip
```

- Relative paths
 - Does not start with a /
 - Relative to where you are when using it

`../documents/results.csv`

`nobackup/dahlo/linux_intro/files.zip`

- Like a direction
 - `4 blocks to the right, 2nd house`

- Summary
 - **ls** – list content of directory
 - **cd** – change working directory
 - **pwd** – print working directory
 - Use them to explore absolute/relative paths

Name	Size	Type	Date Modified
dir		-- folder	2012-01-05 13:44:47
directory1		-- folder	2012-01-05 13:45:43
secondDirectory		-- folder	2012-01-05 13:46:21
bird.jpg	27.6 KB	JPEG Image	2012-01-05 13:46:21
tree.jpg	110.2 KB	JPEG Image	2012-01-05 13:46:09
anotherFile.doc	27.6 KB	Word document	2012-01-05 13:44:47
file1.txt	35.6 KB	plain text document	2012-01-05 13:44:15
file2.old	2.2 KB	backup file	2012-01-05 13:44:33

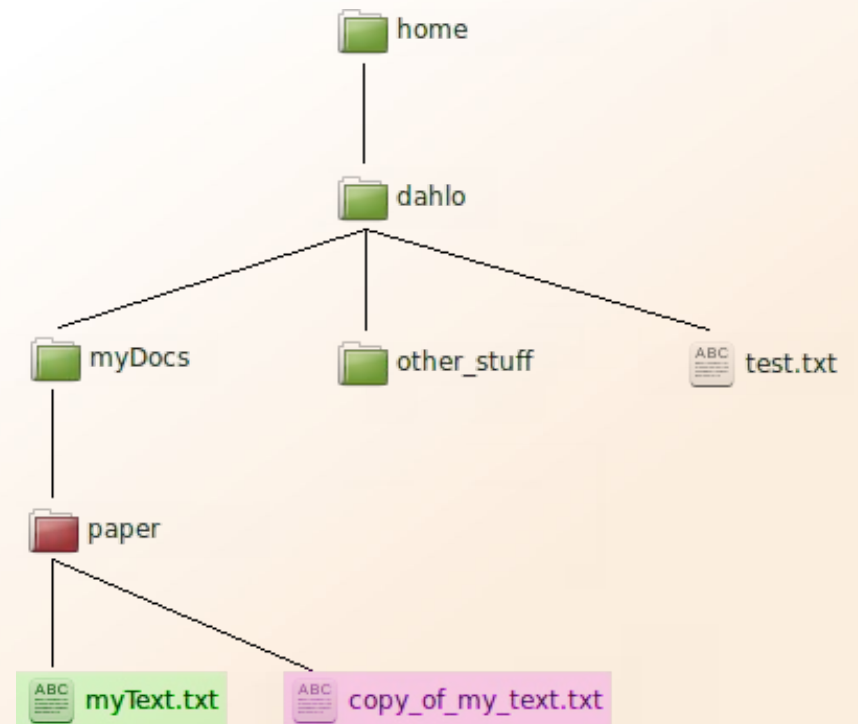
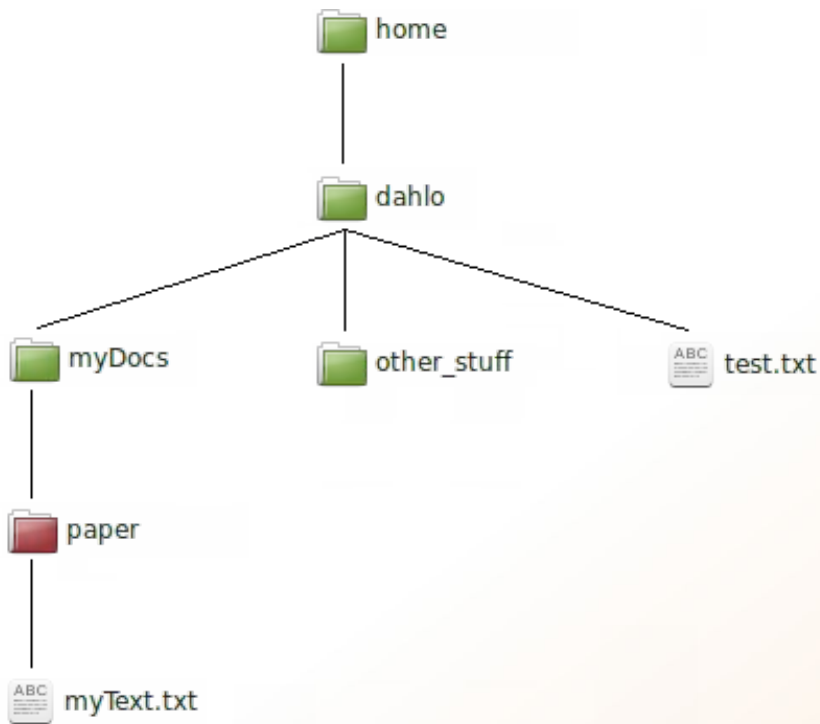
cp - copy a file

```
cp <name of original> <name of copy>
```

cp - copy a file

```
cp <name of original> <name of copy>
```

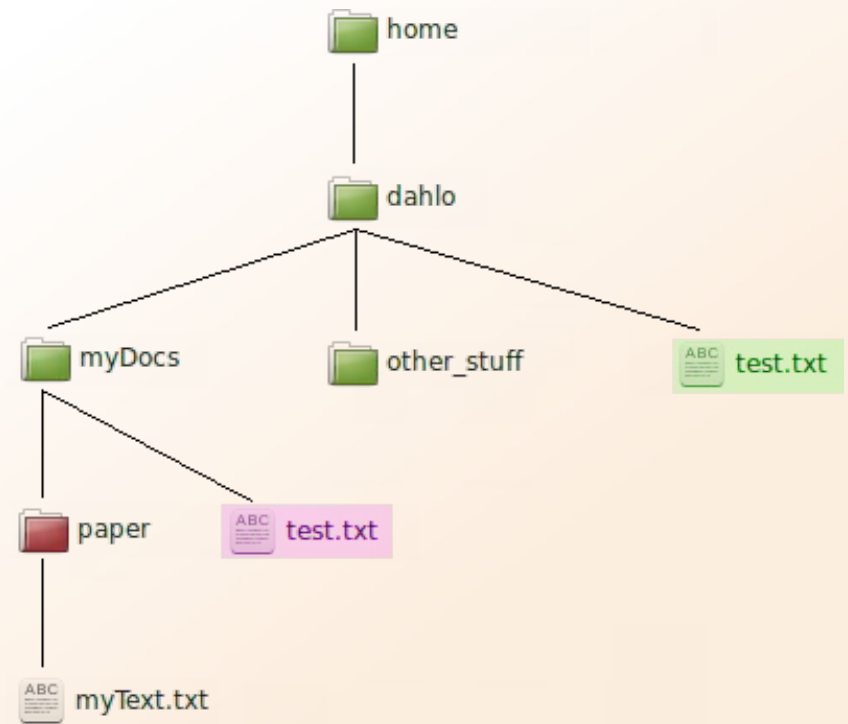
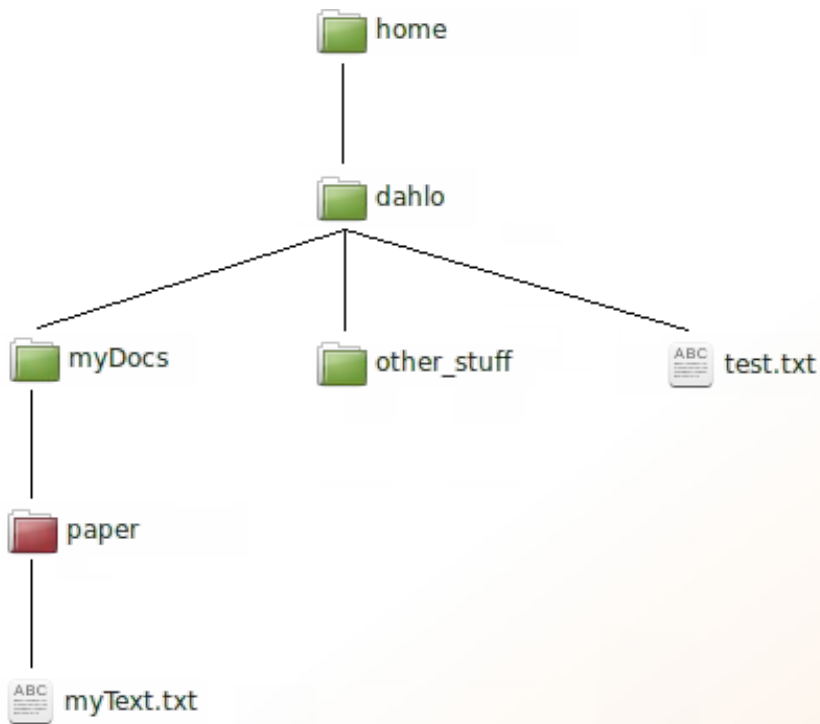
```
cp myText.txt copy_of_my_text.txt
```



cp - copy a file

```
cp <name of original> <name of copy>
```

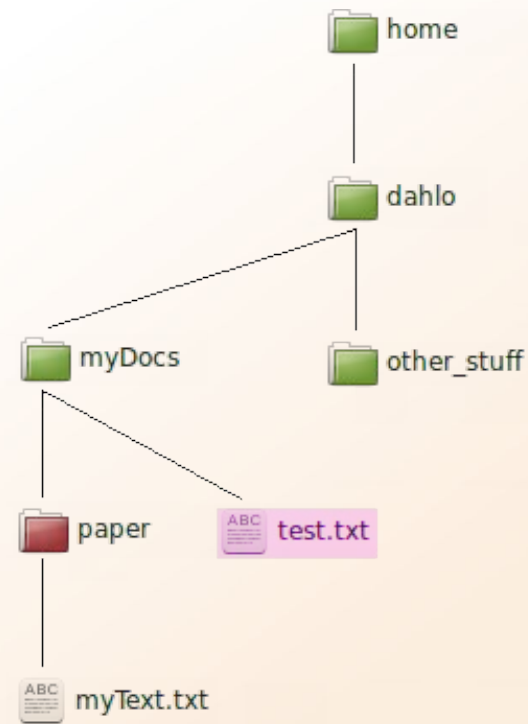
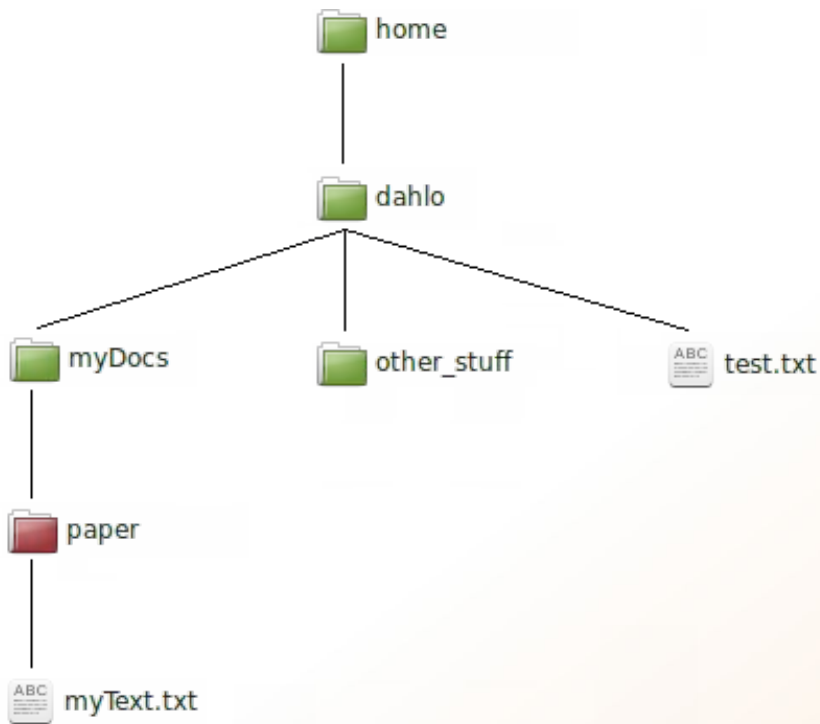
```
cp /home/dahlo/test.txt ../
```



mv - move a file

`mv <name of the file> <name of the "copy">`

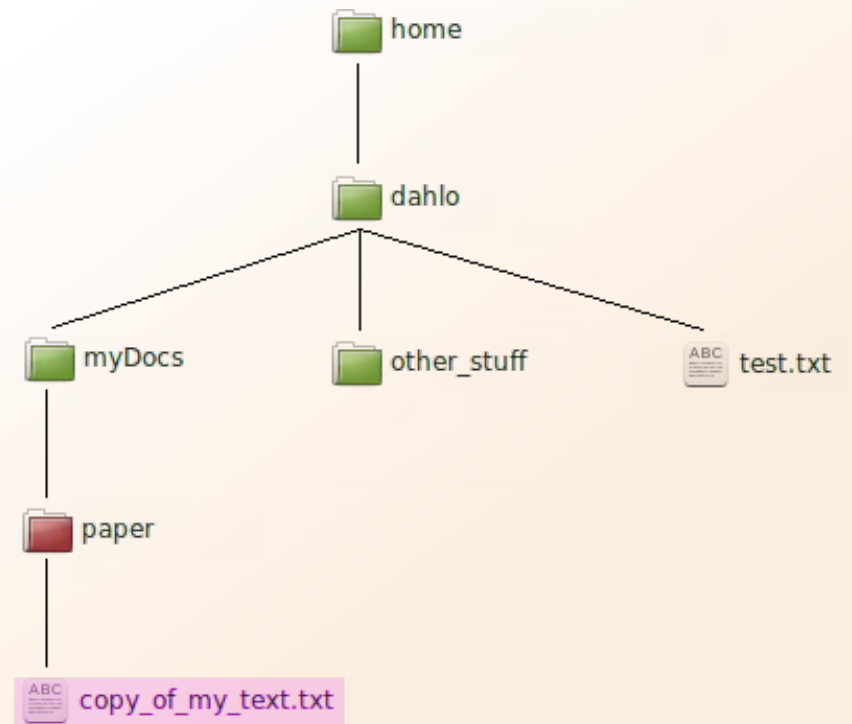
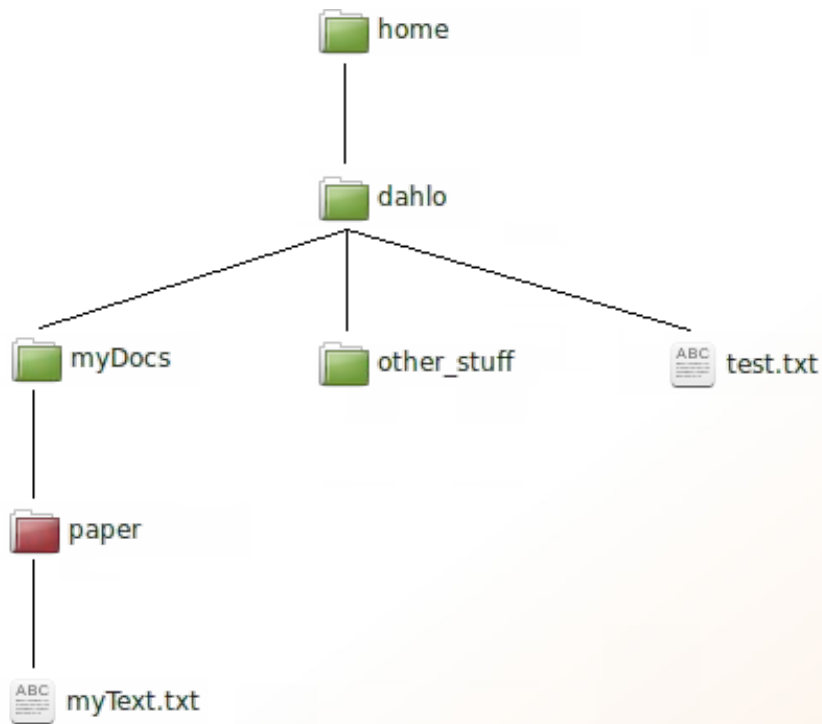
```
mv /home/dahlo/test.txt ../../myDocs/
```



mv - rename a file

```
mv <original name> <new name>
```

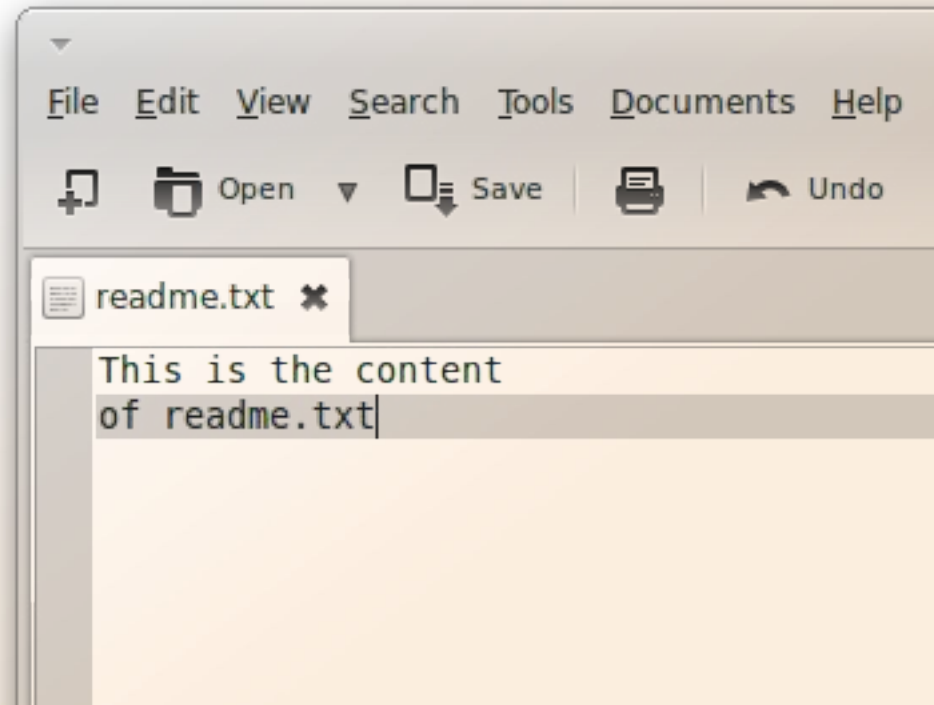
```
mv myText.txt copy_of_my_text.txt
```



less - view content of a file

```
less <file name>
```

```
less readme.txt
```

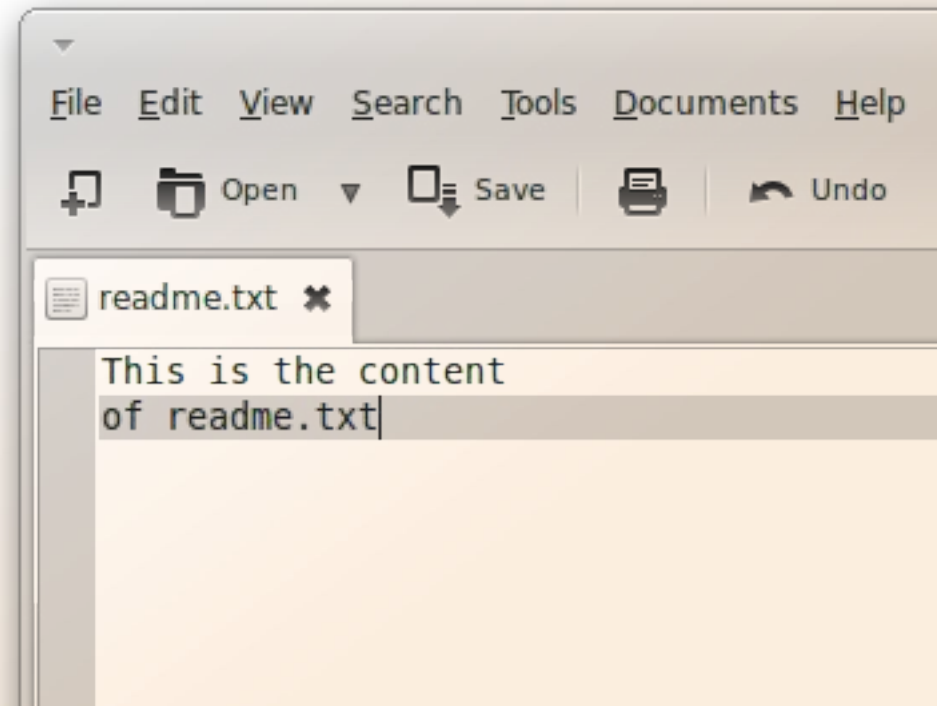


less - view content of a file

```
less <file name>
```

```
less readme.txt
```

```
This is the content  
of readme.txt  
(END)
```



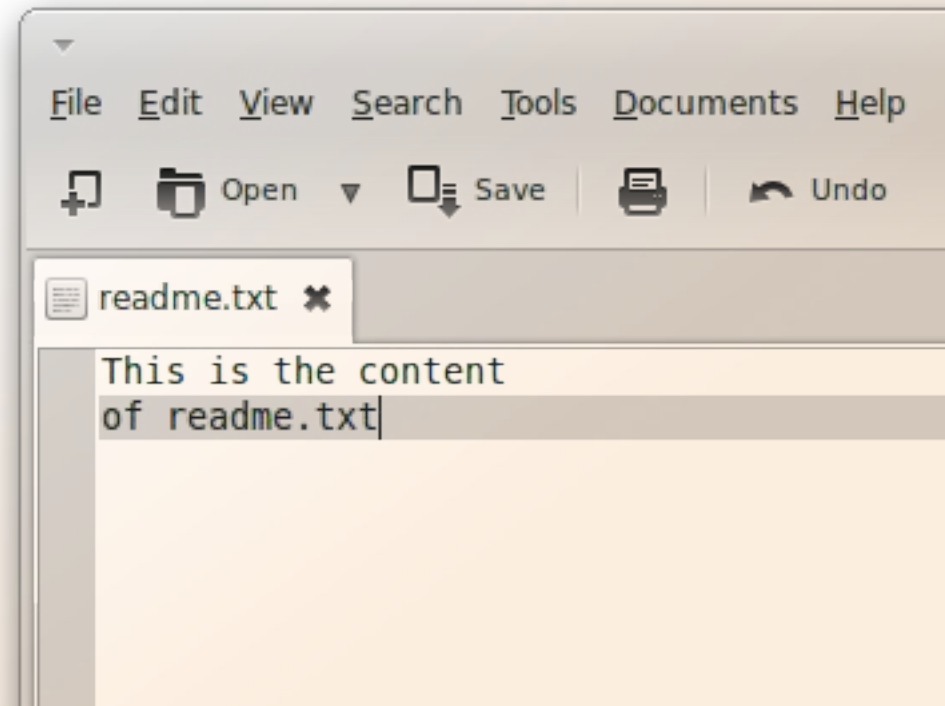
less - view content of a file

```
less <file name>
```

```
less readme.txt
```

```
This is the content  
of readme.txt  
(END)
```

press **Q** to exit less



head - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$
```

head - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root 4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root  0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root  0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root  0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root  0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root  36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
```

head - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root 4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root 0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root 0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root 0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root 0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root 36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ head test.txt
```

head - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root 4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root 0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root 0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root 0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root 0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root 36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ head test.txt
This file contains any messages produced by compilers while
running configure, to aid debugging if configure makes a mistake.

It was created by PSNC DRMAA for SLURM configure 1.0.5, which was
generated by GNU Autoconf 2.67. Invocation command line was

 $ ./configure --with-slurm-inc=/usr/include/slurm --with-slurm-lib=/usr/lib64/slurm --prefix=/bubo/sw/apps/build/slurm
-drmma/1.0.5

## ----- ##
## Platform. ##
[dahlo@dahlo dahlo]$
```

head - view the first rows of a file

```
head -n <nr of lines> <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root 4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root 0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root 0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root 0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root 0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root 36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ head -n 3 test.txt
This file contains any messages produced by compilers while
running configure, to aid debugging if configure makes a mistake.
[dahlo@dahlo dahlo]$
```


tail - view the last rows of a file

```
tail <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root 4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root 0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root 0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root 0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root 0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root 36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ tail test.txt
#define HAVE_STRCASECMP 1
#define HAVE_STRCHR 1
#define HAVE_STRDUP 1
#define HAVE_STRERROR 1
#define HAVE_STRNDUP 1
#define HAVE_STRSTR 1
#define HAVE_STRTOL 1
#define HAVE_VASPRINTF 1

configure: exit 0
[dahlo@dahlo dahlo]$
```

tail - view the last n rows of a file

```
tail -n <nr of lines> <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root 4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root 0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root 0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root 0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root 0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root 36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ tail -n 3 test.txt
#define HAVE_VASPRINTF 1

configure: exit 0
[dahlo@dahlo dahlo]$
```

nano - edit content of a file

```
nano <file name>
```

```
nano readme.txt
```

nano - edit content of a file

```
nano <file name>
```

```
nano readme.txt
```

^ = ctrl

```
GNU nano 2.2.6
```

```
File: readme.txt
```

```
This is the content  
of readme.txt
```

```
[ Read 3 lines ]
```

```
^G Get Help
```

```
^O WriteOut
```

```
^R Read File
```

```
^Y Prev Page
```

```
^K Cut Text
```

```
^C Cur Pos
```

```
^X Exit
```

```
^J Justify
```

```
^W Where Is
```

```
^V Next Page
```

```
^U UnCut Text
```

```
^T To Spell
```

rm - remove a file

There is no trash bin in CLI! Gone is gone..

```
rm <file name>
```

Ex.

```
rm readme.txt
```

```
rm ../../../../file1.txt
```

```
rm /home/dahlo/test.txt
```

*

```
[dahlo@dahlo dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root 0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root 2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root 0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo dir]$
```

*

```
[dahlo@dahlo dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root    0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root    0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo dir]$
[dahlo@dahlo dir]$ ls -l *.txt
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
[dahlo@dahlo dir]$
```

*

```
[dahlo@dahlo dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root    0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root    0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo dir]$
[dahlo@dahlo dir]$ ls -l *.txt
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
[dahlo@dahlo dir]$
[dahlo@dahlo dir]$ ls -l file*
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
[dahlo@dahlo dir]$ █
```


*

Works with most Linux commands

Ex:

```
cp *.txt directory1/
```

*

Works with most Linux commands

Ex:

```
cp *.txt directory1/  
rm *.tmp
```

TAB COMPLETION

(try to) never type a path or filename without it!

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root    0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root    0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano fi
```

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root    0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root    0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano file█
```

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root    0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root    0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano file
file1.txt file2.old
[dahlo@dahlo-linux dir]$ nano file█
```

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root    0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root    0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano file
file1.txt file2.old
[dahlo@dahlo-linux dir]$ nano file1.txt █
```

Good to Know Commands

top - how much is the computer working?

top

```
top - 21:27:48 up 37 days, 7:34, 2 users, load average: 6.38, 6.09, 6.03
Tasks: 278 total, 4 running, 274 sleeping, 0 stopped, 0 zombie
Cpu(s): 73.5%us, 1.5%sy, 0.0%ni, 24.3%id, 0.6%wa, 0.0%hi, 0.0%si, 0.0%st
Mem: 24598372k total, 17703556k used, 6894816k free, 83596k buffers
Swap: 25165816k total, 29704k used, 25136112k free, 15403636k cached
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
5751	zhibing	20	0	1531m	45m	9492	S	100.0	0.2	679:58.20	invaperco
5755	zhibing	20	0	1531m	43m	9492	S	100.0	0.2	679:49.38	invaperco
5759	zhibing	20	0	1531m	43m	9480	S	100.0	0.2	679:56.71	invaperco
5779	zhibing	20	0	1531m	44m	9492	S	100.0	0.2	679:21.84	invaperco
6212	nicusor	20	0	451m	377m	3356	R	100.0	1.6	668:47.67	cretin
28221	roca	20	0	3114m	88m	4188	R	99.7	0.4	8:26.15	seward.exe
16870	root	20	0	0	0	0	S	0.7	0.0	0:13.69	flush-8:0
1781	root	39	19	0	0	0	S	0.3	0.0	17:26.31	kipmi0
1903	root	20	0	0	0	0	S	0.3	0.0	1:24.46	kpanfs_dispatch
28483	dahlo	20	0	13384	1292	884	R	0.3	0.0	0:00.03	top
1	root	20	0	21416	652	448	S	0.0	0.0	0:01.70	init
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	kthreadd
3	root	RT	0	0	0	0	S	0.0	0.0	0:00.14	migration/0
4	root	20	0	0	0	0	S	0.0	0.0	0:01.40	ksoftirqd/0
5	root	RT	0	0	0	0	S	0.0	0.0	0:00.00	migration/0

Instructions how to use programs

Easy to forget syntax

Manual pages

```
man <program name>
```

Ex.

```
man ls
```

(q to quit)

```

LS(1) User Commands LS(1)
NAME
  ls - list directory contents

SYNOPSIS
  ls [OPTION]... [FILE]...

DESCRIPTION
  List information about the FILES (the current directory by default).
  Sort entries alphabetically if none of -cftuvSUX nor --sort.

  Mandatory arguments to long options are mandatory for short options
  too.

  -a, --all
        do not ignore entries starting with .

  -A, --almost-all
        do not list implied . and ..

```

```
:[]
```

How do I log out?

```
exit
```

Exits only the current terminal

- Summary

- `cp` – copy a file
- `mv` – move a file
- `less` – view a file
- `nano` – view and edit a file
- `rm` – remove a file
- `head / tail`
- `wildcards`
- **tab completion – use it!!!**
- `top` – see active processes
- `man` – manual pages
- `exit` – Log out current terminal

About 581 000 results (0,79 seconds)

However, **renaming multiple** or group of **files** quickly makes it very difficult task in a terminal. **Linux** comes with a very powerful built-in tool called **rename**. The **rename** command is used to **rename multiple** or group of **files**, **rename files** to lowercase, **rename files** to uppercase and overwrite **files** using perl expressions. Oct 10, 2013



Rename – A Command Line Tool For Renaming Multiple Files in Linux

<https://www.tecmint.com/rename-multiple-files-in-linux/>

 About this result  Feedback

Howto: Linux Rename Multiple Files At a Shell Prompt – nixCraft

<https://www.cyberciti.biz/tips/renaming-multiple-files-at-a-shell-prompt.html> ▼

Nov 26, 2005 - **Rename** command syntax. It is a faster way to group **rename files** in **Linux** or Unix-like system. Say hello to zmv for zsh. Say hello to mmv command. Examples: **Linux Rename Multiple Files** Using a Shell Script. POSIX shell **rename** all *.bak to *.txt. **Linux** Shell script to **rename files**. Perl Script To **Rename File**.

linux - How to rename multiple files in single command or script in ...

<https://unix.stackexchange.com/.../how-to-rename-multiple-files-in-single-command-...> ▼

ssh - Secure SHell connection (ssh)

```
ssh -Y <username>@dardel.pdc.kth.se
```

Ex:

```
ssh -Y dahlo@dardel.pdc.kth.se
```

Terminal in Linux and OS X

PowerShell in Windows

ssh - Secure SHell connection (ssh)

```
ssh -Y <username>@dardel.pdc.kth.se
```

Ex:

```
ssh -Y dahlo@dardel.pdc.kth.se
```

Terminal in Linux and OS X

PowerShell in Windows

Requires SSH keys or Kerberos

Laboratory time!

https://nbisweden.github.io/workshop-ngsintro/2411/topics/linux/lab_linux_intro.html