SciLifeLab
UPPSALA

Linux Introduction

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Enabler for Life Sciences

SciLifeLab
Uppsala Multidisciplinary Center for Advanced Computational Science
UPPMAX
UPPNEX
UPPSALA UNIVERSITET

SciLifeLab UPPSALA

Objectives

What is CLI, shell, terminal

What is directory tree

How to use simple commands for:

- navigating in the directory tree
- manipulating files (create, edit, copy, move, delete)

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Linux **Introduction**

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

Learn by practice and repetition!!!

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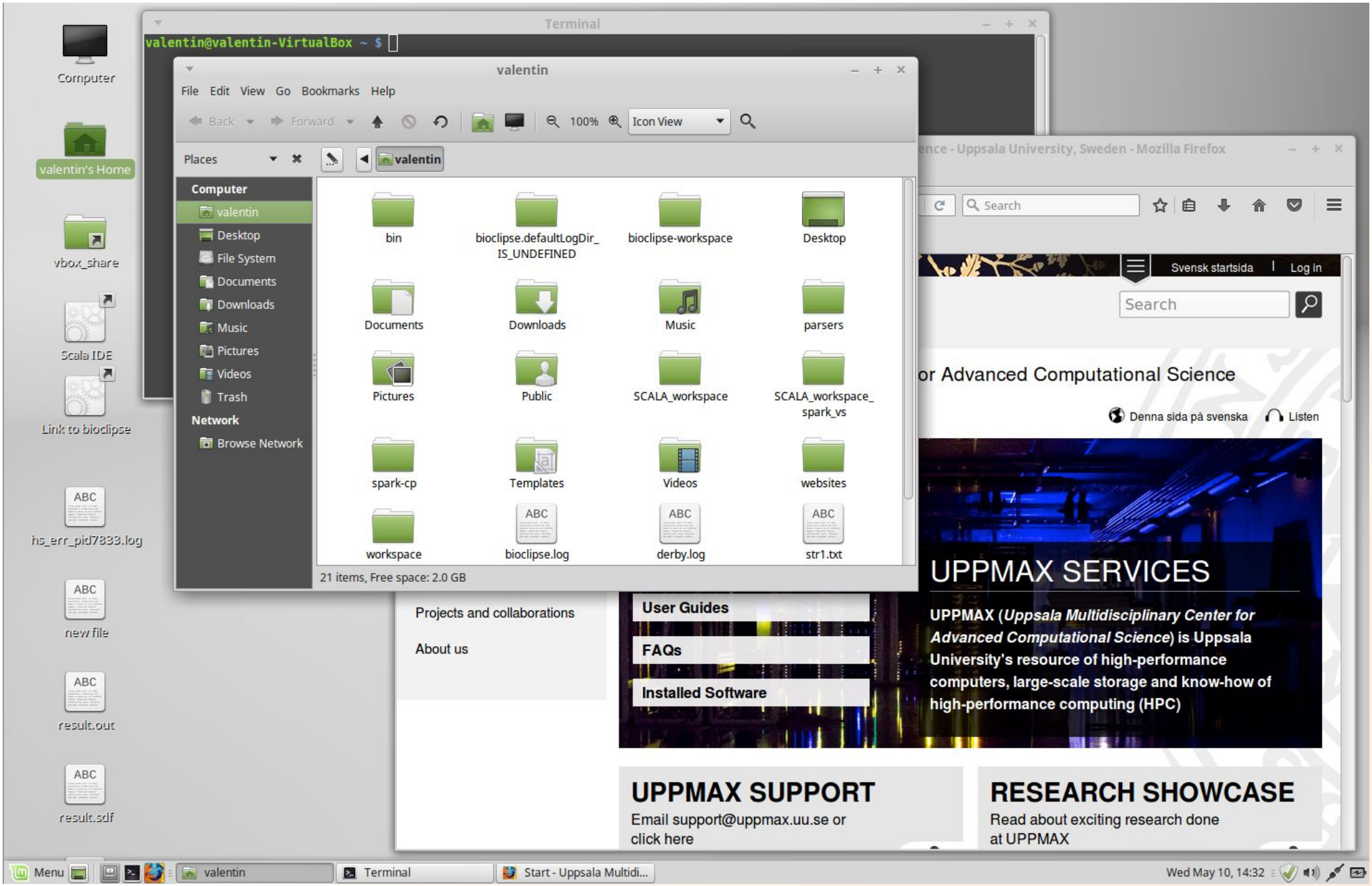
Linux



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Linux

```
-rw-r--r--  1 valentin valentin  51709 Oct 12  2015 str1.txt
-rw-r--r--  1 valentin valentin 126832 Oct 12  2015 str2.txt
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Templates
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-clipboard.pid
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-display.pid
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-draganddrop.pid
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-seamless.pid
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Videos
-rw-------  1 valentin valentin   4798 Feb 15  2016 .viminfo
drwxr-xr-x  3 valentin valentin   4096 Jan 11  2016 websites
drwxr-xr-x  3 valentin valentin   4096 Jun  8  2016 workspace
-rw-------  1 valentin valentin    130 May 10 14:29 .Xauthority
-rw-r--r--  1 valentin valentin    131 Sep  2  2015 .xinputrc
-rw-r--r--  1 valentin valentin   3197 May 10 14:31 .xsession-errors
valentin@valentin-VirtualBox ~ $ ll
total 780
drwxr-xr-x 35 valentin valentin   4096 May 10 14:30 ./
drwxr-xr-x  3 root     root       4096 Sep  1  2015 ../
drwx------  3 valentin valentin   4096 Sep  2  2015 .adobe/
-rw-------  1 valentin valentin   6412 Dec 10 11:48 .bash_history
-rw-r--r--  1 valentin valentin    220 Sep  1  2015 .bash_logout
-rw-r--r--  1 valentin valentin    305 Feb 15  2016 .bashrc
drwxr-xr-x  8 valentin valentin   4096 Sep  2  2015 bin/
drwxr-xr-x  2 valentin valentin   4096 Nov  3  2016 bioclipse.defaultLogDir_IS_UNDEFINED/
-rw-r--r--  1 valentin valentin 366894 Jun 15  2016 bioclipse.log
drwxr-xr-x  9 valentin valentin   4096 Nov  3  2016 bioclipse-workspace/
drwxr-xr-x  9 valentin valentin   4096 Sep  2  2015 .cache/
drwxr-xr-x 17 valentin valentin   4096 Sep  8  2015 .config/
drwx------  3 valentin valentin   4096 Sep  1  2015 .dbus/
-rw-r--r--  1 valentin valentin    709 Sep  2  2015 derby.log
drwxr-xr-x  2 valentin valentin   4096 Oct 12  2015 Desktop/
-rw-------  1 valentin valentin      2 May 10 14:29 .dmrc
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Documents/
drwxr-xr-x  3 valentin valentin   4096 Nov  3  2016 Downloads/
drwx------  3 valentin valentin   4096 May 10 14:29 .gconf/
-rw-r--r--  1 valentin valentin     74 Sep  2  2015 .gitconfig
-rw-r-----  1 valentin valentin      0 Sep  1  2015 .gksu.lock
drwx------  3 valentin valentin   4096 Sep  1  2015 .gnome/
drwx------  4 valentin valentin   4096 Jun 15  2016 .gnome2/
drwx------  2 valentin valentin   4096 Sep  1  2015 .gnome2_private/
-rw-r--r--  1 valentin valentin     37 Jan 11  2016 .httrack.ini
-rw-------  1 valentin valentin  15540 May 10 14:29 .ICEauthority
drwxr-xr-x  4 valentin valentin   4096 Sep  7  2015 .java/
-rw-------  1 valentin valentin     35 Sep  2  2015 .lesshst
drwxr-xr-x  4 valentin valentin   4096 Sep  1  2015 .linuxmint/
drwx------  3 valentin valentin   4096 Sep  1  2015 .local/
drwxr-xr-x  3 valentin valentin   4096 Sep  1  2015 .m2/
drwx------  3 valentin valentin   4096 Sep  2  2015 .macromedia/
drwxr-xr-x  4 valentin valentin   4096 Sep  1  2015 .mozilla/
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Music/
-rw-r--r--  1 valentin valentin    213 Sep  2  2015 .pam_environment
drwxr-xr-x  4 valentin valentin   4096 Sep  2  2015 parsers/
```

Command Line Interface (CLI)

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Concepts

Shell - user interface

Graphical shells - Microsoft shell
X Window System

Text (CLI) shells - bash
tcsh
zsh

Terminal

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UPPMAX

Uppsala Multidisciplinary Center for Advanced Computational Science

(Uppsala supercomputer center)

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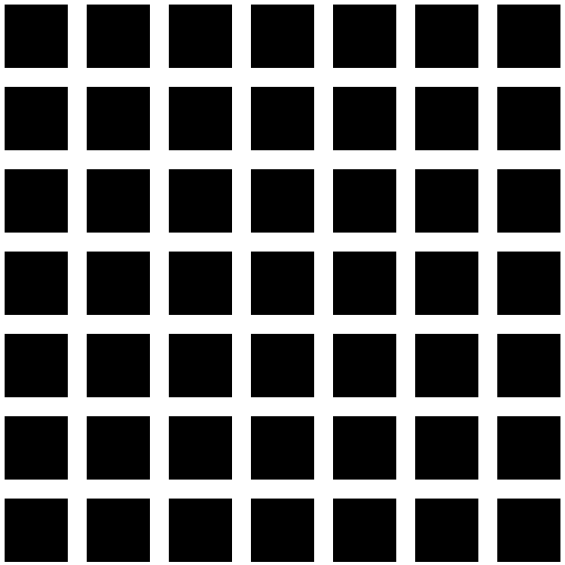
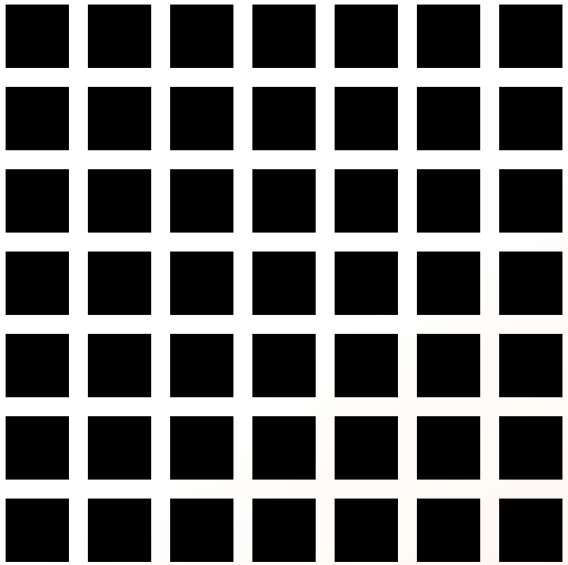
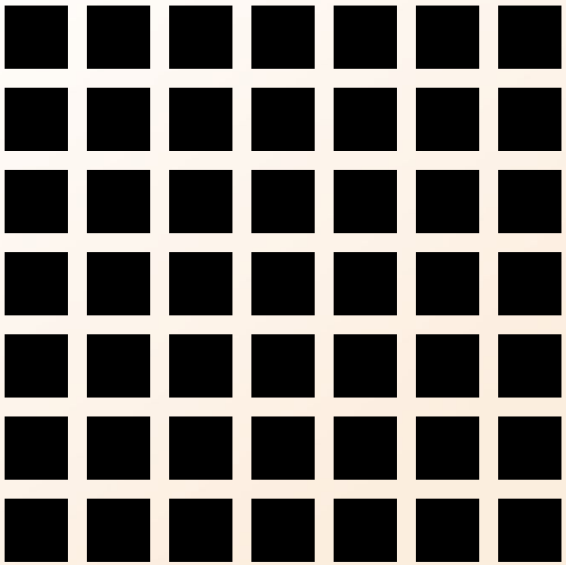
Computer clusters



Milou



Rackham



Bianca

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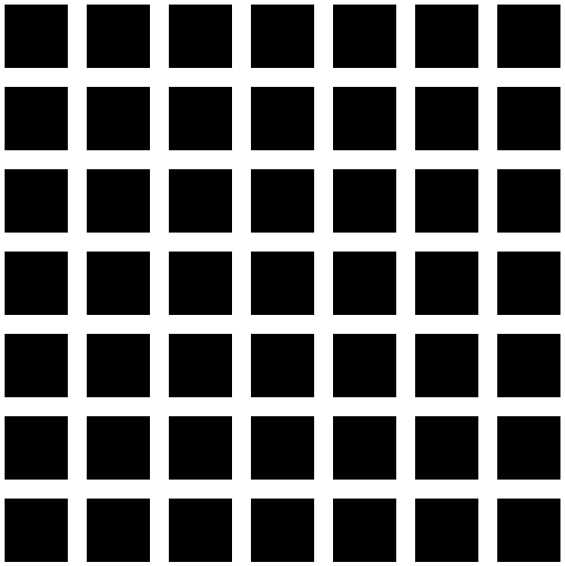
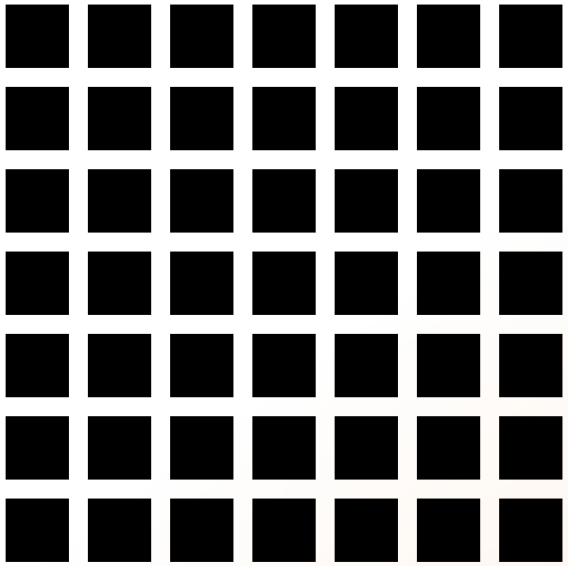
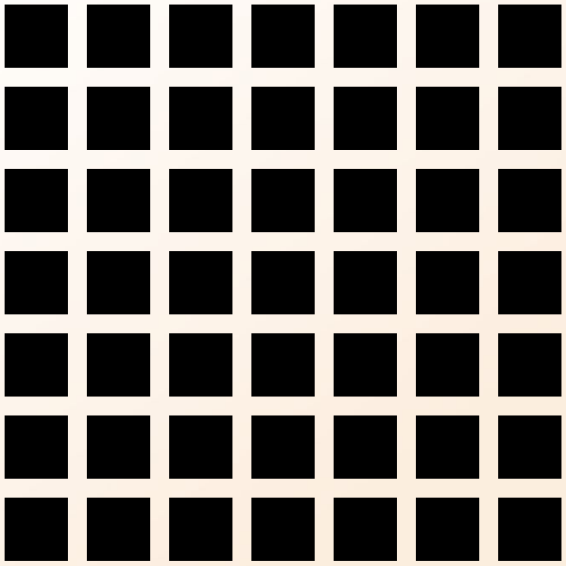
Computer clusters



Milou



Rackham



Bianca

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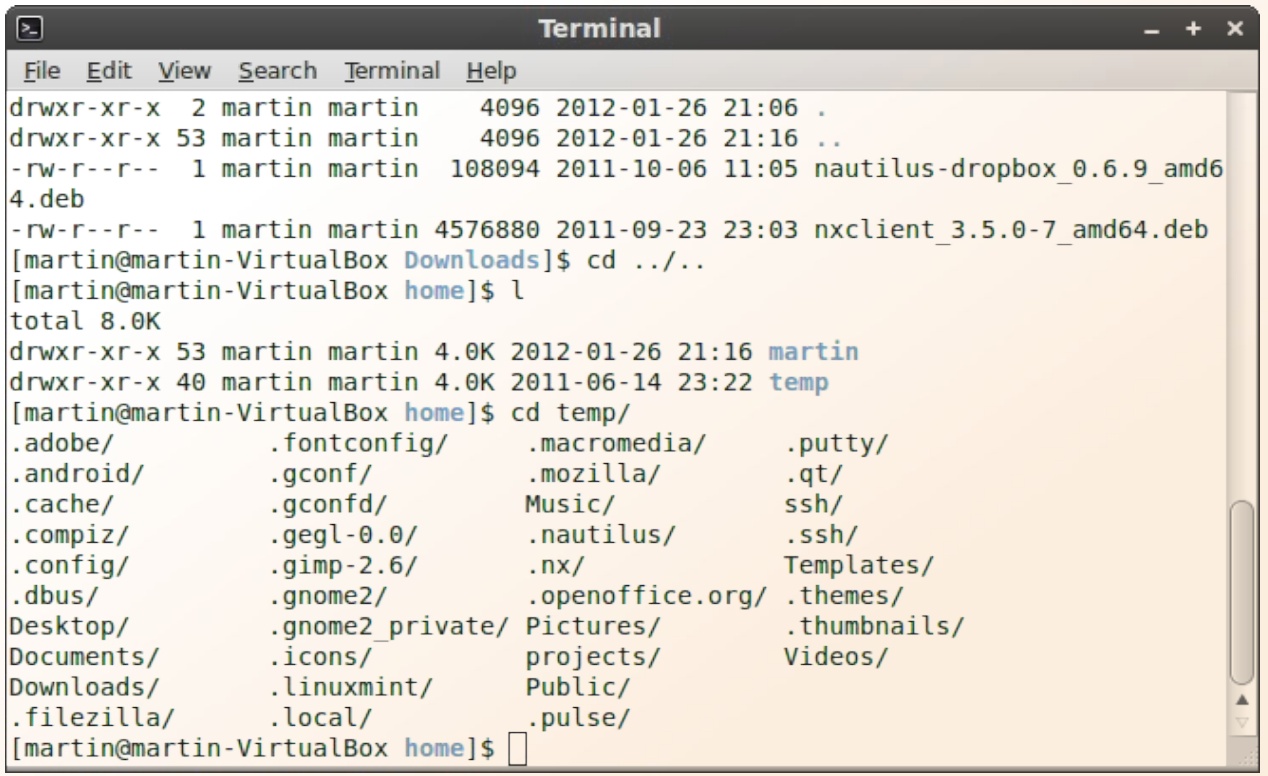
Why Text?

UPPMAX is accessible over the internet

Command Line Interface (CLI)

Terminal



Files and programs

Data

Files

File structure (directory tree)

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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
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
1.annovar.exonic_variant_function	242.9 KB	unknown	2011-05-18 15:34:30
1.annovar.hg19_snp131_dropped	837.2 KB	unknown	2011-05-18 15:34:30
1.annovar.hg19_snp131_filtered	905.6 KB	unknown	2011-05-18 15:34:30
1.annovar.log	725 bytes	application log	2011-05-18 15:34:30
1.annovar.stat	938 bytes	unknown	2011-05-18 15:34:30
1.annovar.variant_function	2.3 MB	unknown	2011-05-18 15:34:31
1.non_sym_gene_list	94.3 KB	unknown	2011-05-18 15:34:31
1.non_sym_gene_list_not_in_dbsnp	78.8 KB	unknown	2011-05-18 15:34:31
1.stop_gain_gene_list	4.4 KB	unknown	2011-05-18 15:34:31
1.stop_gain_gene_list_not_in_dbsnp	4.3 KB	unknown	2011-05-18 15:34:31
1.sym_gene_list	51.4 KB	unknown	2011-05-18 15:34:31
1.sym_gene_list_not_in_dbsnp	34.3 KB	unknown	2011-05-18 15:34:31
test.out	2.7 MB	out document	2011-05-18 15:34:31
all.plot	500 bytes	unknown	2011-05-18 15:34:30
summary.ods	23.2 KB	OpenDocument Spreadsheet	2011-05-18 15:34:31

Programs

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Computers

Programs = commands

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Commands

program_name *-option1* *-option2* input_file output_file

options and input/output files - can be optional

Navigation Commands

home directory

your own (account) directory

working directory

the directory you are “sitting” in now

Navigation Commands

pwd – print working directory

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

Navigation Commands

pwd – print working directory

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

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

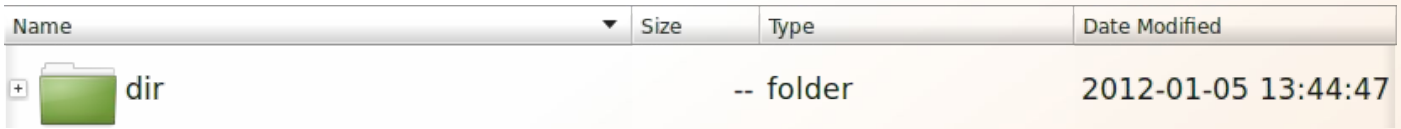
Navigation Commands

ls – list the content of a directory

Navigation Commands

ls – list the content of a directory

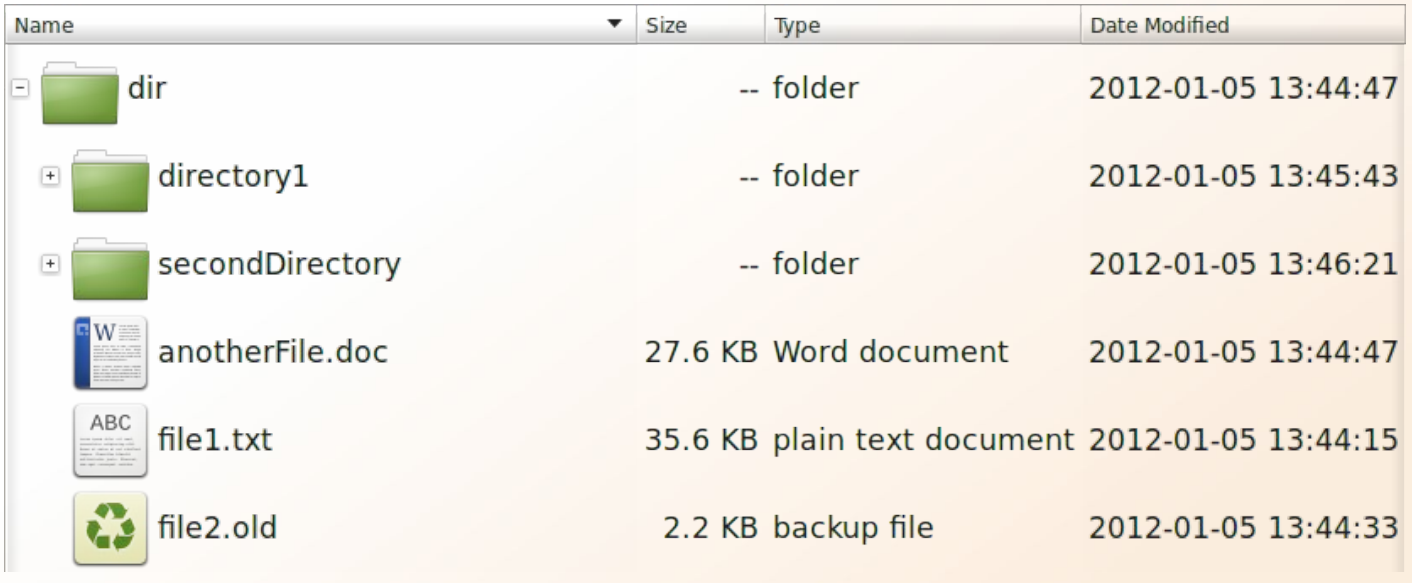
```
[dahlo@kalkyl4 dir]$
```



Navigation Commands

ls – list the content of a directory

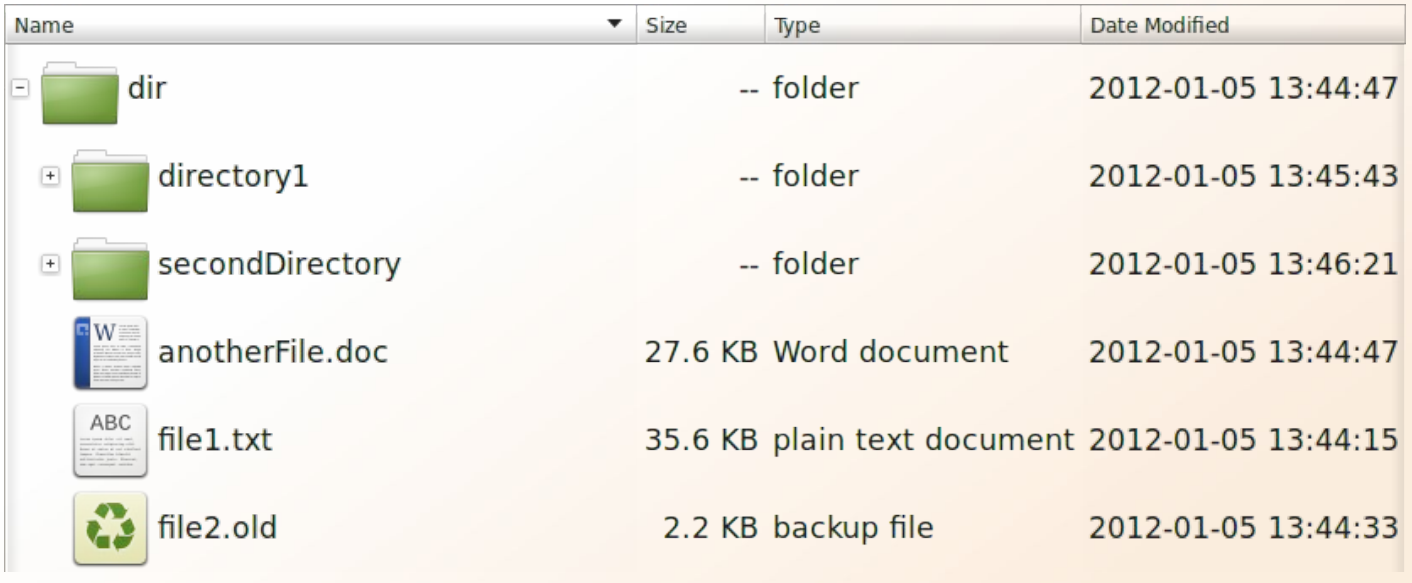
```
[dahlo@kalkyl4 dir]$ ls
anotherFile.doc  directory1  file1.txt  file2.old  secondDirectory
```



Navigation Commands

ls – list the content of a directory

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

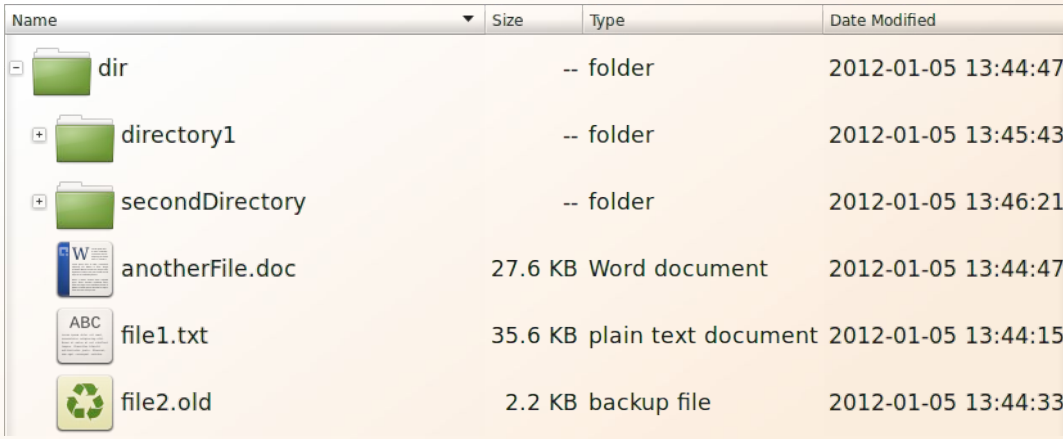


Navigation Commands

cd – change working directory

cd <directory name> = down/forward

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

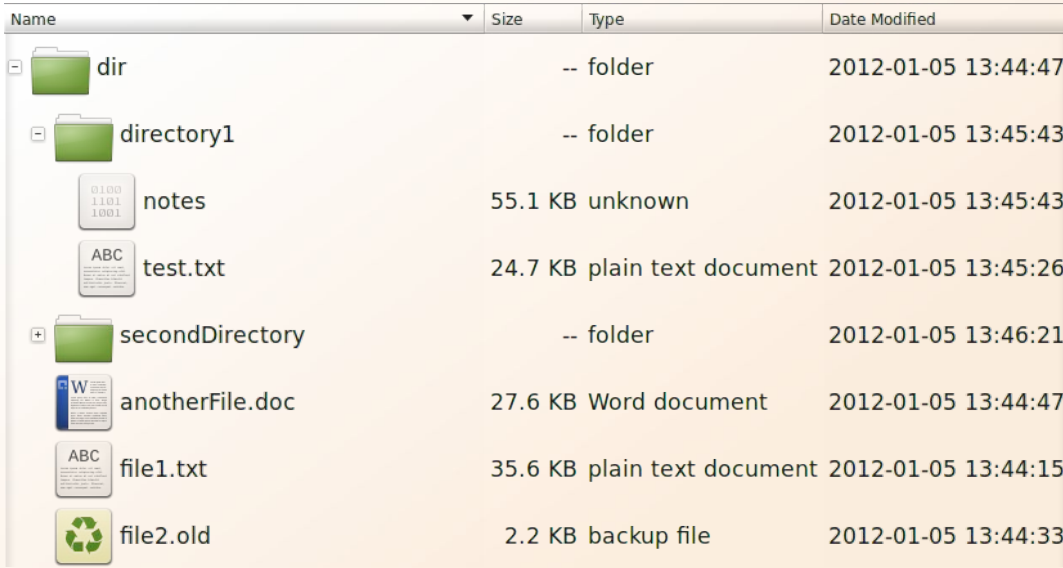


Navigation Commands

cd – change working directory

cd <directory name> = down/forward

```
[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
```



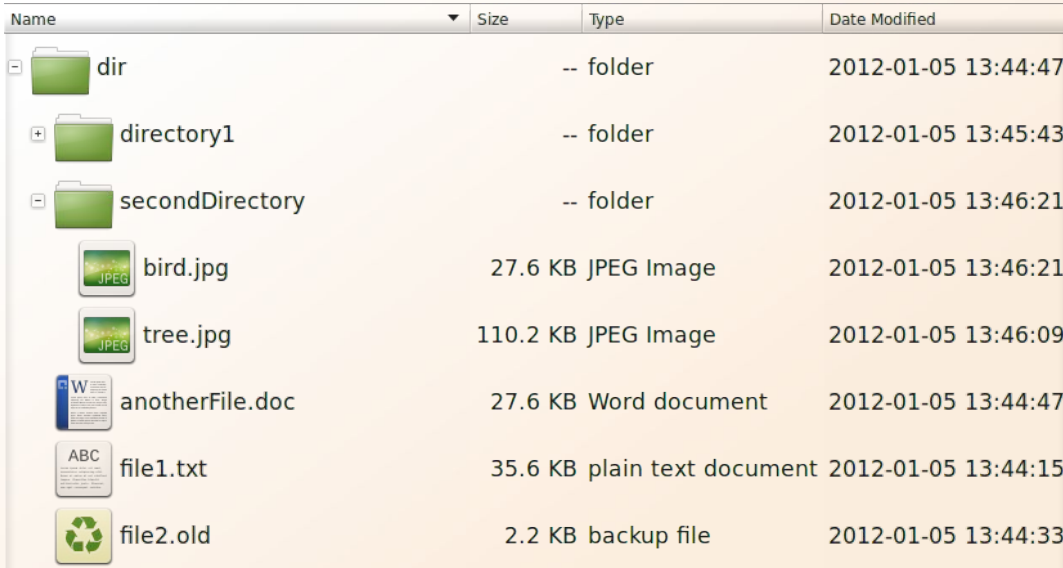
Navigation Commands

cd – change working directory

cd <directory name> = down/forward

cd .. = up/back

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



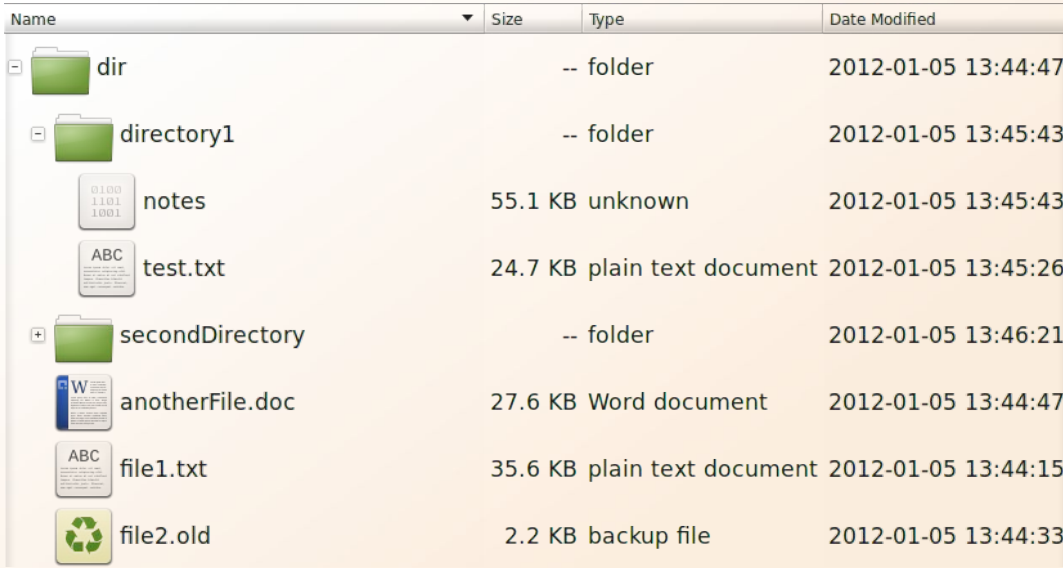
Navigation Commands

cd – change working directory

cd <directory name> = down/forward

cd .. = up/back

```
[dahlo@kalkyl4 secondDirectory]$ ls -l ../directory1/
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
```



Navigation Commands

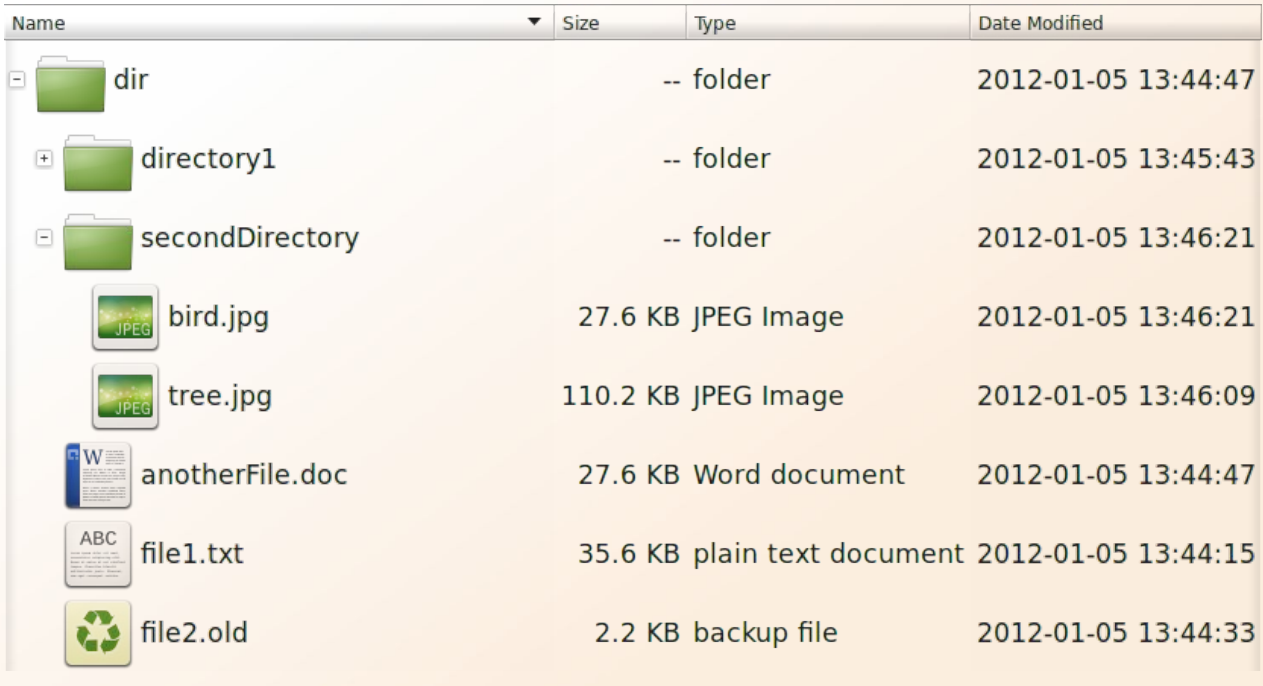
cd – change working directory

cd <directory name>	= down/forward
cd ..	= up/back
cd	= go home = cd /home/dahlo/

Navigation Commands

Summary

pwd – print working directory
ls – list content of directory
cd – change working directory



Interaction Commands

cp - copy a file

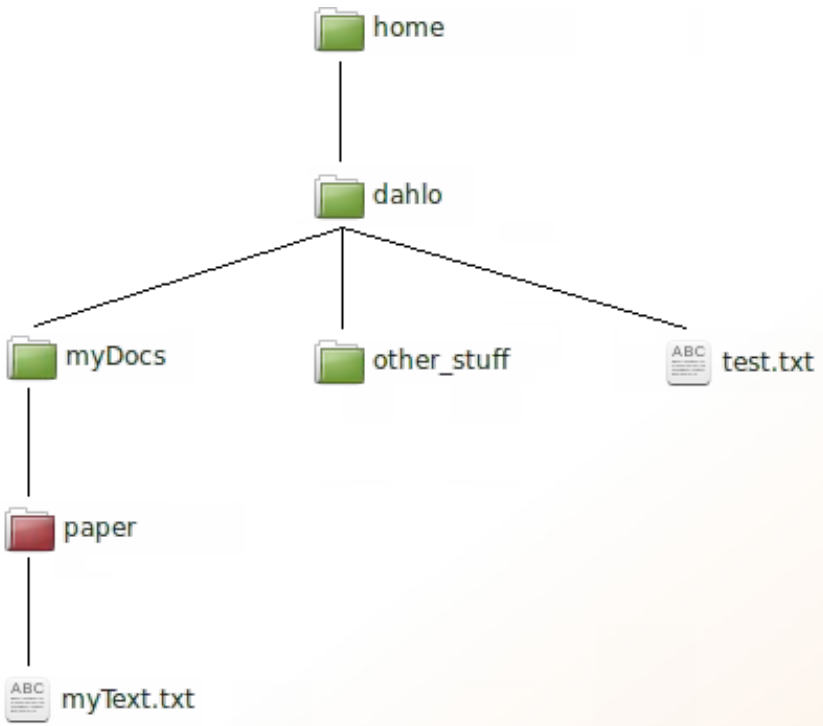
cp <name of original> <name of copy>

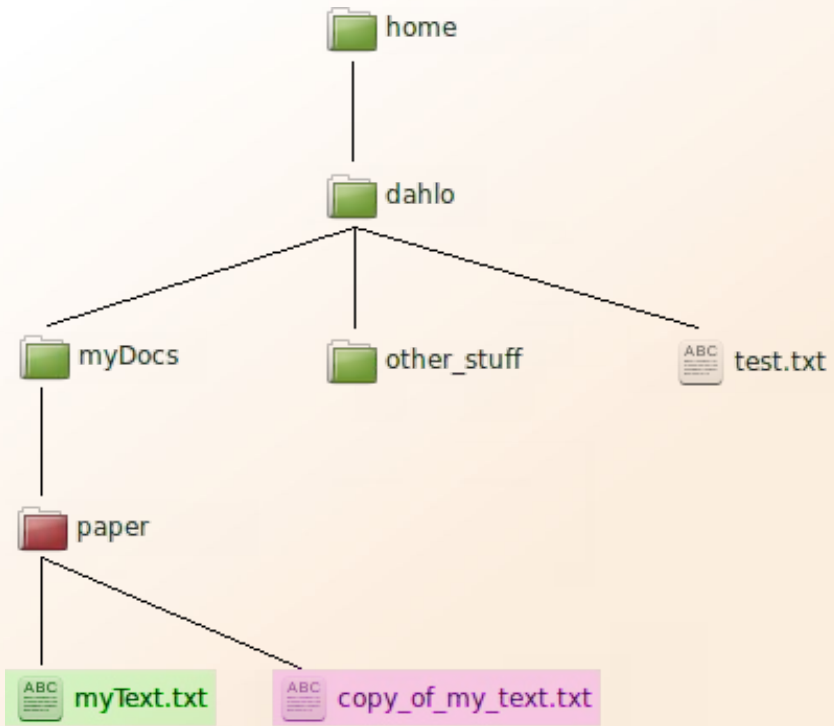
Interaction Commands

cp - copy a file

cp <name of original> <name of copy>

cp myText.txt copy_of_my_text.txt



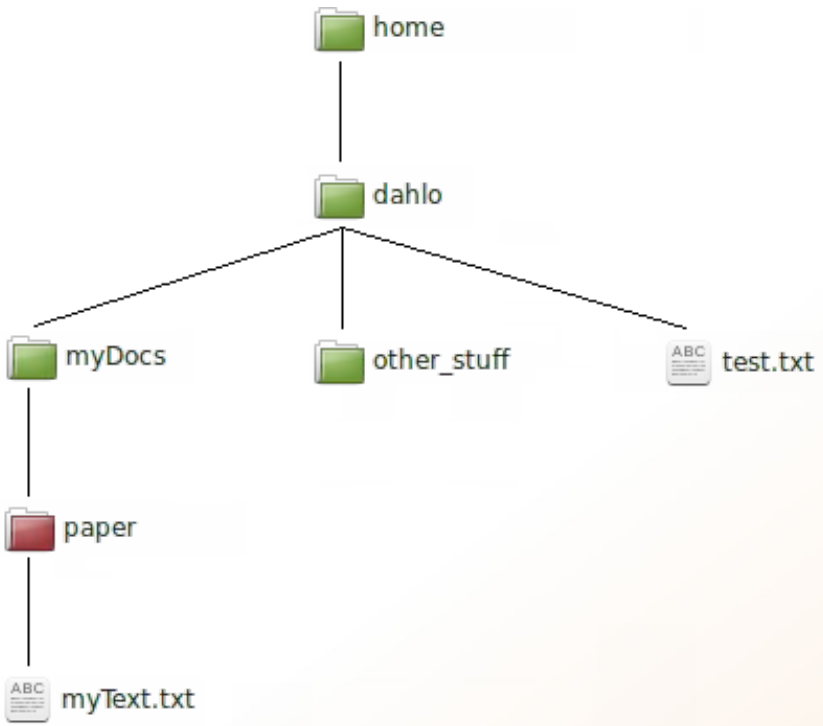


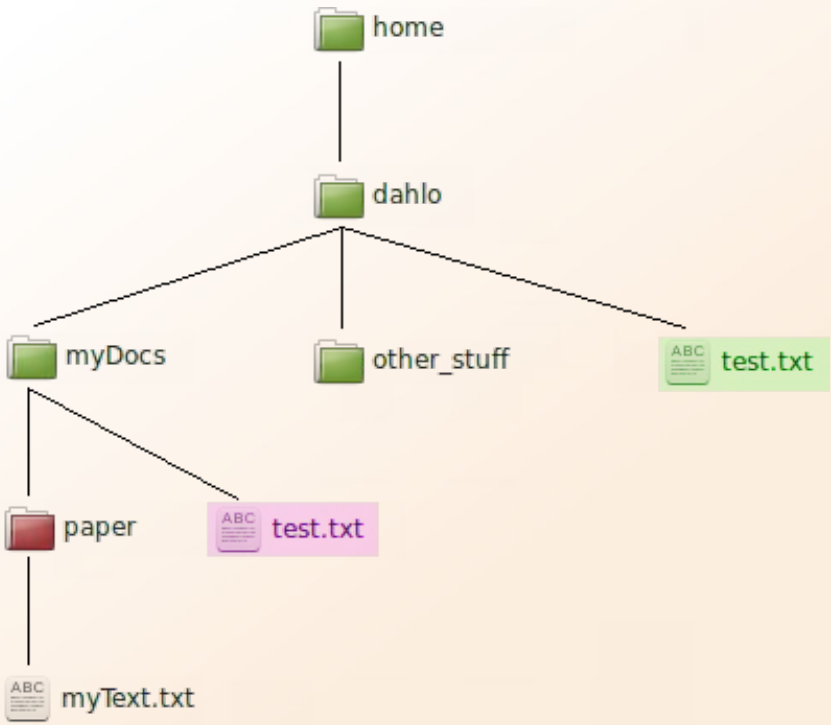
Interaction Commands

cp - copy a file

cp <name of original> <name of copy>

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



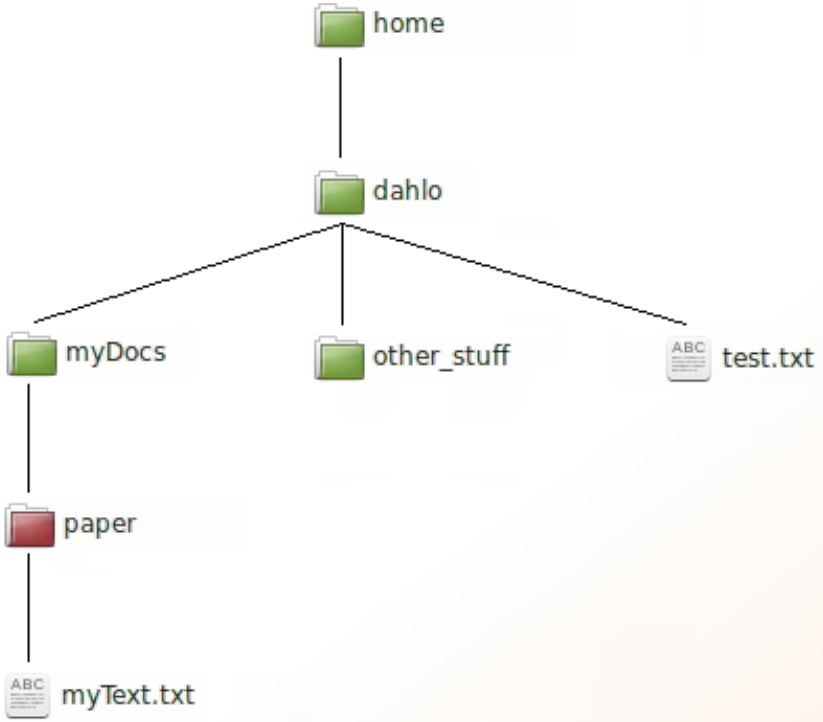


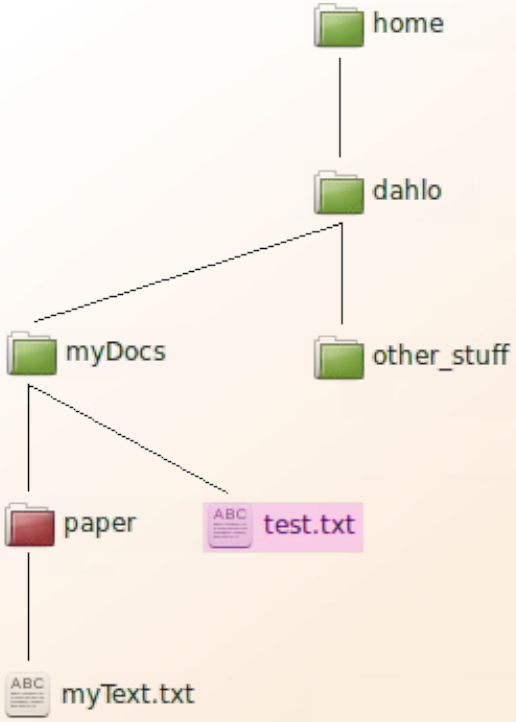
Interaction Commands

mv - move a file

mv <name of the file> <name of the “copy”>

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



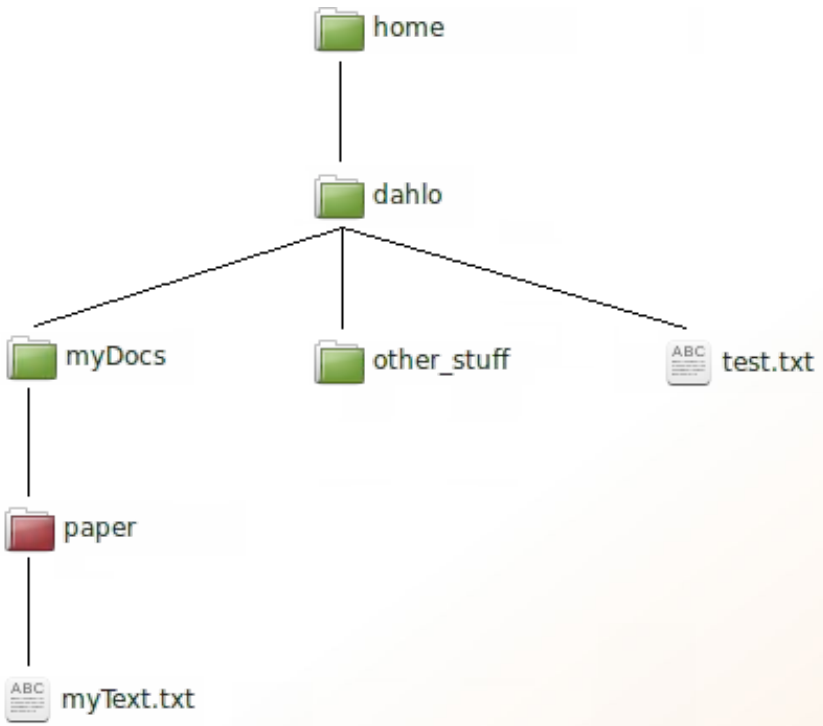


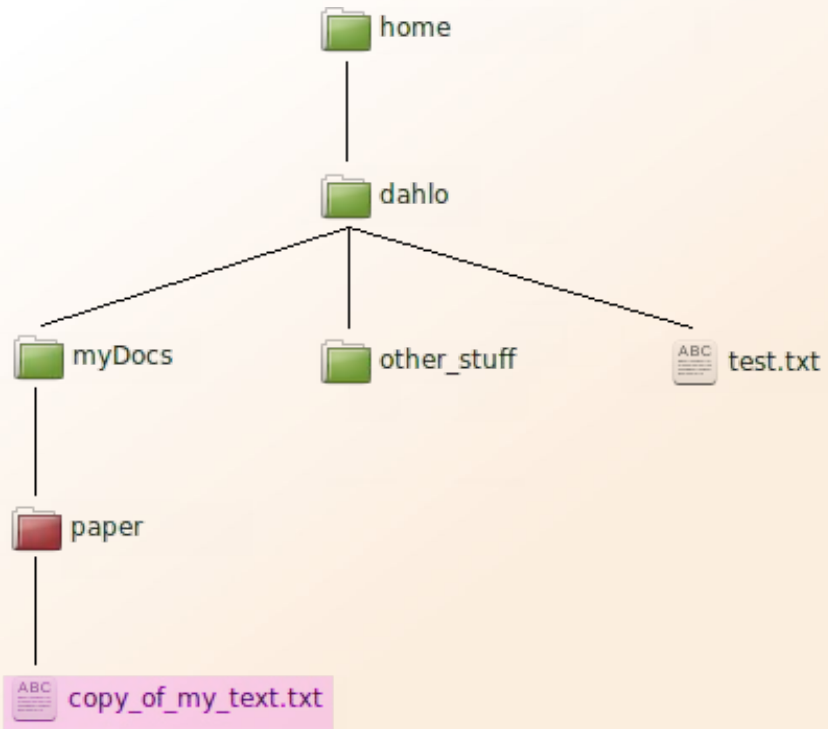
Interaction Commands

mv - rename a file

mv <original name> <new name>

mv myText.txt copy_of_my_text.txt



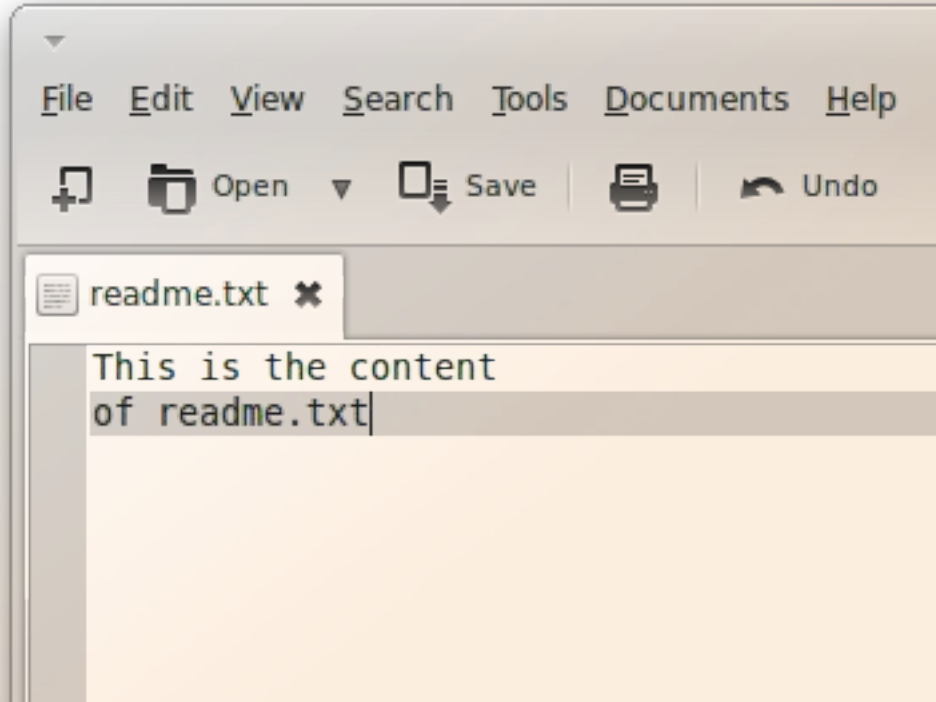


Interaction Commands

less - view content of a file

less <file name>

less readme.txt



Interaction Commands

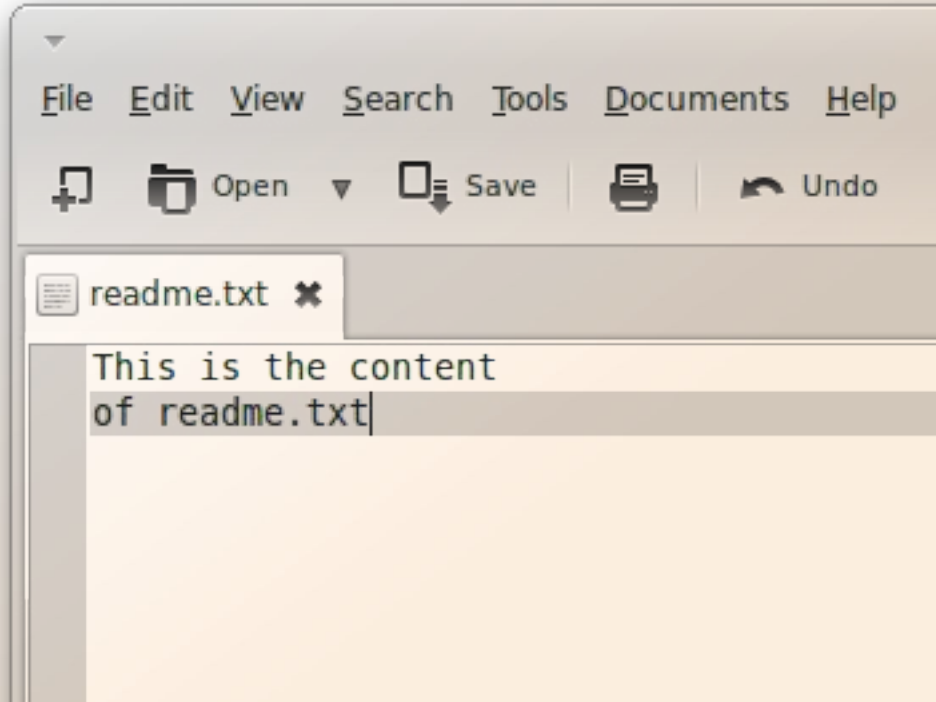
less - view content of a file

less <file name>

less readme.txt

```
This is the content
of readme.txt

readme.txt (END)
```



Interaction Commands

less - view content of a file

less <file name>

less readme.txt

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

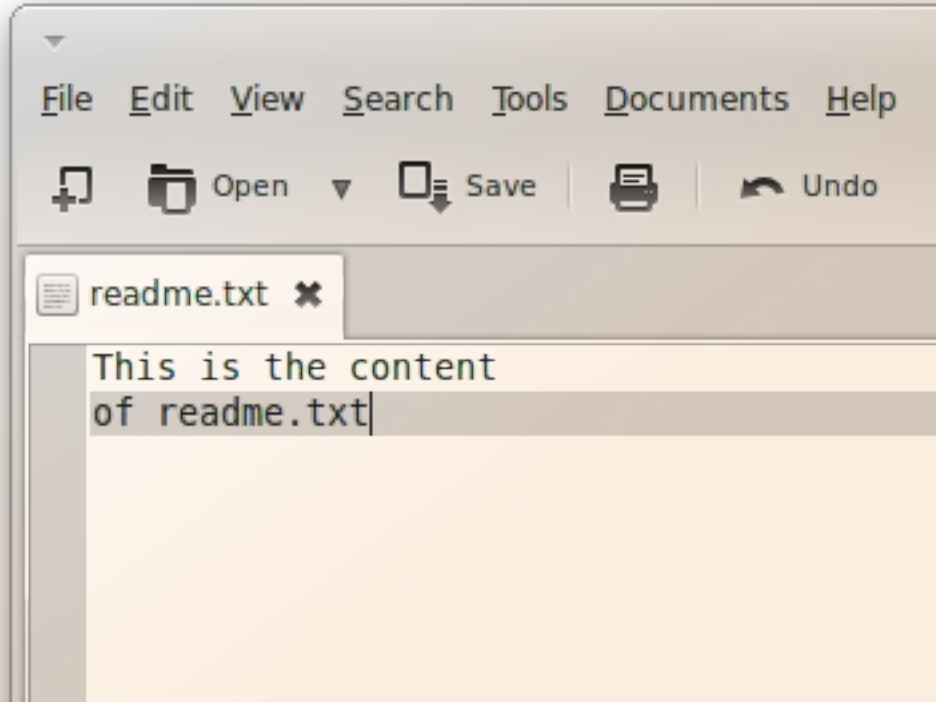

press **Q** to exit less

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Head

head - view the first rows of a file

head <filename>

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

Head

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

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
```

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Head

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
-drmaa/1.0.5

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

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Head

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]$
```

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Tail

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]$
```

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Tail

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]$
```

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Interaction Commands

nano - edit content of a file

nano <file name>

nano readme.txt

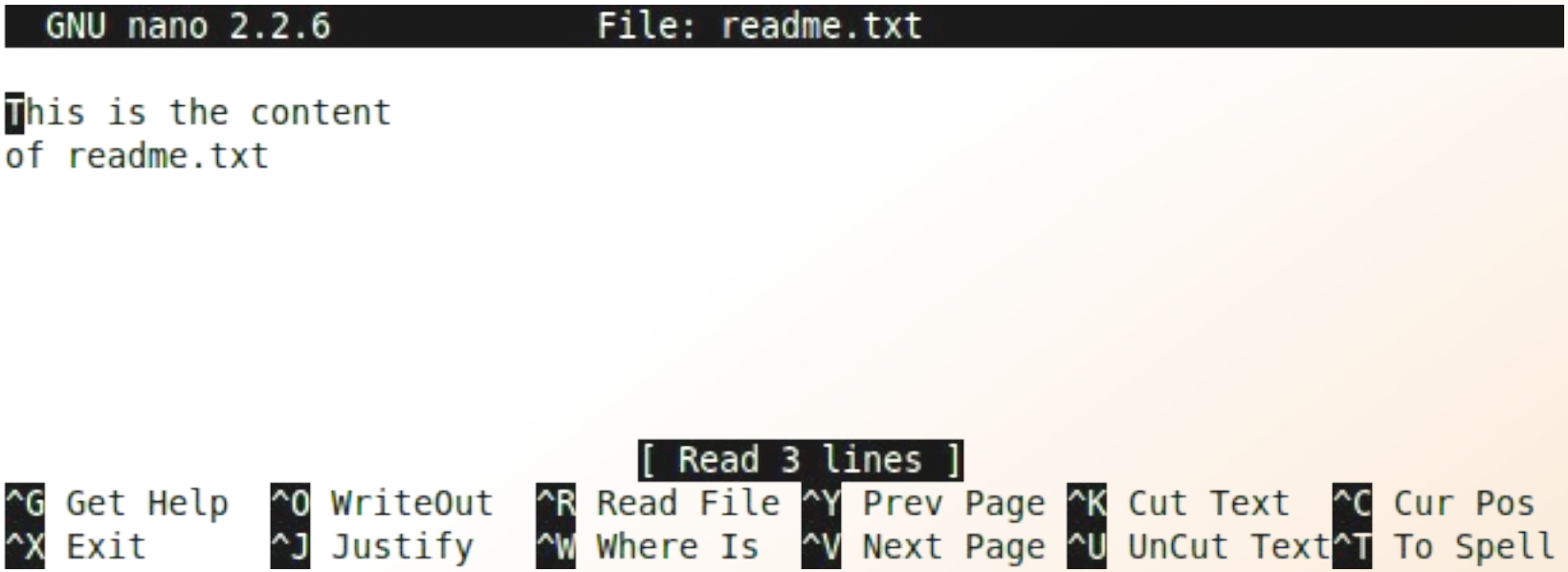
Interaction Commands

nano - edit content of a file

nano <file name>

nano readme.txt

^ = ctrl



Interaction Commands

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

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Wildcards

*

```
[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]$
```

Wildcards

*

```
[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]$
```

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Wildcards

*

```
[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]$
```

Wildcards

*

Works with most Linux commands

Ex:

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

Wildcards

*

Works with most Linux commands

Ex:

```
rm   *.tmp
```

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The most important thing

TAB COMPLETION

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

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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
```

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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
```

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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
```

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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
```

Good to Know Commands

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 ..

:
```

Good to Know Commands

How do I log out?

exit

Exits only the current terminal

Good to Know Commands

- 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

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Google

how rename multiple files in linux

All Videos Images News Shopping More Settings Tools

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-...

Enabler for Life Sciences

Connect to UPPMAX

ssh - Secure SHell connection (ssh)

ssh -Y <username>@milou.uppmax.uu.se
Ex:
ssh -Y valent@milou.uppmax.uu.se

Terminal in Linux and OS X

MobaXterm in Windows (http://mobaxterm.mobatek.net/)
Putty also alternative, but not as good..

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Laboratory time!