Programming Introduction

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Contents

1 Terminal

1.1 Introduction

```
> uname -mns
  Darwin imac.local i386
  Report bugs to <bug-coreutils@gnu.org>.
> uname -mns
  Darwin mbkp.local i386
> ssh anker.unibe.ch
  user@bender.unibe.ch's password:
> uname
  Linux
> uname -mon
  bender x86_64 GNU/Linux
> uname --help
  Usage: uname [OPTION]...
  Print certain system information. With no OPTION, same as -s.

    -a, --all print all information, in the following order,
                            except omit -p and -i if unknown:
    -s, --kernel-name print the kernel name
    -n, --nodename print the network node hostname
    -r, --kernel-release print the kernel release
    -v, --kernel-version print the kernel version
    -m, --machine print the machine hardware name
    -p, --processor print the processor type or "unknown"
    -i, --hardware-platform print the hardware platform or "unknown"
    -o, --operating-system print the operating system
        --help display this help and exit
        --version output version information and exit
```

1.2 Commands

`rm` removes a file or a directory

```
cami@bender:~/test$ ls
todelete.txt
cami@bender:~/test$ rm todelete.txt
cami@bender:~/test$ ls
```

`touch` updates the access and modification times of each FILE to the current time.

```
cami@bender:~/test$ ls -l
-rw-r--r-- 1 cami cami 0 2009-08-25 20:29 date.txt
cami@bender:~/test$ touch date.txt
```

```
cami@bender:~/test$ ls -l
-rw-r--r-- 1 cami cami 0 2009-08-25 20:30 date.txt
```

It can be very useful to create a new empty file on the fly:

```
~/test$ ls
~/test$ touch emptyfile.txt
~/test$ ls
emptyfile.txt
```

2 Documentation with Latex

2.1 Introduction

In this section we explain some LaTeX details and different formatting commands.

Whenever you need to lookup a certain symbol for LaTeX we suggest you to use the online recognition tool `detexify` at `http://detexify.kirelabs.org/`.

2.2 Common Commands

2.2.1 Sectioning

Depening on the documentclass given in the very beginning of this file there exist several sectioning levels:

1. `\section{NAME}`
2. `\subsection{NAME}`
3. `\subsubsection{NAME}`
4. `\paragraph{NAME}`

To enforce LaTeXto use a newline add a double slash `\\` at the end of a line.

2.2.2 Font size and style

`\rm`	A normal text
`\sl`	*An italic text*
`\bf`	**A bold text**
`\tiny`	A tiny ext
`\scriptsize`	A very, very small text
`\footnotesize`	A very small text
`\small`	A small text
`\large`	A big text
`\Large`	A bigger text
`\LARGE`	An even bigger text
`\huge`	A huge text
`\Huge`	An enormous huge text
`\emph`	*An emphasized text*
`\underline`	An underlined text and here using the ulem-package
`\texttt`	`function goto(int a) ...`
`\uuline`	A double unterstrichener text using the ulem-package
`\uwave`	A wavy unterstrichener text using the ulem-package
`\sout`	~~A crossed trough text using the ulem-package~~
`\xout`	A deleted text using the ulem-package

2.2.3 Notes

To create a footnote use the `\footnote{YOUR NOTE}` command[1].
If you want to put a remark at side of a page use `\marginpar`.

This is a note at the border of the page.

2.2.4 Lists

There exist several list types in LaTeX. You start a list by adding a `\being{LISTTYPE}` and end it with an `\end{LISTTYPE}`. A list item is added with a `\item` between the `begin` and `end`. `LISTTYPE` can be one of the following list:

- `enumerate`
- `itemize`
- `description` with `\item[topic]`

Note that you can nest lists if you want to.

1. e4
    a) e4 e5

[1] ... as you can see here.

b) Lc4 d6

2. Lc4 d6

2.2.5 Math, LaTeX's real strengths

A much longer introduction, although still called a short math guide, is avaiable online at `ftp://ftp.ams.org/pub/tex/doc/amsmath/short-math-guide.pdf`.

Inline Mode Equations with numeration with `\begin{equation} FORMULA \end{equation}`:

$$E_{kin} = \frac{1}{2}mv^2 \tag{1}$$

Equations without numeration with `\begin{equation*} FORMULA \end{equation*}`:

$$E_{kin} = \frac{1}{2}mv^2$$

Shortcut using `\[ FORMULA \]`:

$$-\frac{\hbar}{2m}\Delta\Phi(\vec{r}) + V(\vec{r})\Phi(\vec{r}) = E\Phi(\vec{r})$$

Inline mode with `$ FORMULA $` displays as $\int_{\infty}^{\infty} |\psi(x)^2|\mathrm{dx} = 1$.

Parenthesis

$$\left(\left(\left((())\right)\right)\right)$$

Spaces

Small spaces	`\_`	$y = x^2 \_ y' = 2x \_ y'' = 2$
Middle sized spaces	`\quad`	$y = x^2 \quad y' = 2x \quad y'' = 2$
Big spaces	`\qquad`	$y = x^2 \qquad y' = 2x \qquad y'' = 2$

Indices and Powers

$$a_i, x^{n+1} \qquad a_{ij} + b_{ij} = p_{ij} \qquad \ldots \text{and nested} \qquad a_{x_ij} = n_{x^{2^b_n}}$$

Fractions

$$\frac{Zaehler}{Nenner} \qquad \frac{a}{b} + \frac{c}{b} = \frac{a+c}{b} \qquad \frac{\frac{a}{b}}{\frac{c}{d}} \qquad \frac{\binom{n+1}{k/2}}{5!}$$

In the simple math environment two FORMULAdifferent sized fractions can be used; the small fractions $\frac{1}{2}$ or the normal sized $\frac{1}{x}$.

Roots

$$\sqrt[\text{root depth}]{\text{root term}} \qquad \sqrt{x+y-z}, \sqrt[5]{4+x}$$

Functions

$$f : \mathbb{N} \to \mathbb{R} \qquad f : x \mapsto x^2$$

Mathematical functions are writtein explicitely written in normal text not math mode text:

$$\sin(x) = \sin(x) \textbf{ and not } sin(x)$$

Varia

$$\left(\sqrt{\frac{A^C}{B_y}} + \sum_{i=1}^{N} a_i \right)$$

$$A \xrightarrow{\lambda_a} B$$

$$\iint z\,dx\,dy \quad \textbf{not} \quad \int\int zdxdy$$

$$\iint z\,dx\,dy \quad \textbf{not} \quad \int\int zdxdy$$

$$\Leftarrow \Leftrightarrow \Longleftrightarrow \Rightarrow \_ \Uparrow \Updownarrow \Downarrow$$

$$\bigcap \cap \sum \int_0^{2\pi} \vec{a} \dot{a} \ddot{a} a''$$

Matrices

$$\det A = \|a_{ik}\| = \begin{vmatrix} a_{11} & a_{12} & a_{13} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{23} & \cdots & a_{2n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & a_{n3} & \cdots & a_{nn} \end{vmatrix}.$$

3 Ruby Programming

3.1 man

allsdh lajsdk eir aldj cansjflasdj fowej fldjfa lvclachv adj lfj aljfdawje foajd ljalcv jldfj ladsjfa dlsjfladsjf lajf lwejladjv ladjv lasdjl adsfldsj flksdj ljdfld jflj flj asljd s

3.2 cd

To move directories up and back use the following commands:

- **cd** returns you to your login directory
- **cd ..** moves you up one directory
- **cd /** takes you to the entire system‘s root directory
- **cd /home** takes you to the home directory
- **cd /dir1/subdirfoo** this absolute path would take you to subdirfoo

3.3 ls

”ls” lists the contents of a directory. To list the different informations of a directory use:

- **ls** list the contents of your home directory
- **ls ..** list the contents of the parent directory
- **ls /** lists the contents of your root directory
- **ls -R** includes the contents of the subdirectories
- **ls -l** lists the contents with more informations
- **ls -a** includes directories whose names start with a dot (.).

3.4 pwd

”Pwd” means ”print working directory”, it shows you the directory you are currently in. Normally pwd is just used by itself. But there are two options:

- **pwd -L** display the logical current working directory.

- **pwd -P** display the physical current working directory.

3.5 mkdir

The "mkdir" (make directory) is used to make a new directory. There are a few options:

- **mkdir** creates a new directory within the current directory
- **mkdir -p** creates also all directories leading up to the given directory that do not exist already.
- **mkdir -v** display each directory that mkdir creates.
- **mkdir -m** Set the file permission bits of the newly-created directory to the specified mode value.

3.6 touch

The **touch** command changes certain dates for each file argument. By default, touch sets both the date of last file modification and the date of last file access to the current time.

- **touch** sets the modification time of the fie to the present
- **touch -t** specifies a particular time using this format: [cc][yy][MM][dd]hhmm[.ss]. It changes the access and the modification time.
- **touch -a** specifies the access time.
- **touch -m** specifies the modification time.
- **touch -r** for example: touch -r oldfile newfile
  sets the access and modification time of "newfile" to that of "oldfile".

- **touch -f** attempt to force the update, even if the file permissions do not currently permit it.
- **touch -c** does not create any files that do not already exist. Normally, touch creates such files.

3.7 mv

"mv" (move files) either renames the file or moves it into an existing direcory.

- **mv oldname newname** rename the file "oldname" into "newname"
- **mv a b** moves the folder "a" into "b", if "b" is an existing directory
- **mv a ../** moves "a" one directory up
- **mv a /documents/b** moves "a" into "documents" and renames it to "b"

There are also a few different options for mv:

- **-i** Cause mv to write a prompt to standard error before moving a file that would overwrite an existing file.
- **-f** Do not prompt for confirmation before overwriting the destination path.
- **-n** Do not overwrite an existing file.
- **-v** Cause mv to be verbose, showing files after they are moved.

3.8 cp

"cp" (copy) can be used to copy files or directories.

- **cp a b** copies the file "a" to "b".
- **-a** Preserves structure and attributes of files but not directory structure.

- **-f** If the destination file cannot be opened, remove it and create a new file, without prompting for confirmation regardless of its permissions.
- **-p** Cause cp to preserve the following attributes of each source file in the copy: modification time, access time, file flags, file mode, user ID, and group ID, as allowed by permissions. Access Control Lists (ACLs) and Extended Attributes (EAs), including resource forks, will also be preserved.
- **-R** If the source designates a directory, cp copies the directory and the entire subtree connected at that point.

3.9 rm

"rm" (remove) is used to remove files and directories from a filesystem. Options:

- **rm a** removes the file "a", to remove more than just one file, just write: rm a b, to remove the file "a" and the file "b".
- **rm -i** requests confirmation to delete the file.
- **rm -d** removes directories as well as other types of files.
- **rm -r** removes directories recursively.
- **rm -P** overwrites regular files before deleting them.

3.10 cat

"cat" (concatenate) reads one or more files and prints them to standard output.The operator **>** can be used to combine multiple files into one.

- **cat a** prints the file "a".
- **cat a b > c** combines file a and b into c and prints it.

- **cat -e** display non-printing characters, and display a dollar sign at the end of each line.
- **cat -n** number the output lines, starting at 1.

Hier eine kleine Änderung...