Programming Introduction

PUT YOUR NAME HERE

HS 2010 University Bern

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

apple a nice fruit

cherry
also a nice fruit

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`	$y = x^2$	$y' = 2x$ $y'' = 2$
Big spaces	`\qquad`	$y = x^2$	$y' = 2x$ $y'' = 2$

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