Tecniche di programmazione in chimica computazionale
Introduction to Linux

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- Practical introduction to the use of Linux

Our goal

- Practical introduction to the use of Linux
- Working using a terminal

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Historical overview

- Two physical/logical layers:
  - hardware: physical components
  - software: instructions (on a set of data) for a computer
- Originally, instructions written in the physical format
- Idea: write instructions according to rules close to the programmer

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- High-level languages, **independent** on the hardware

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- UNIX was the name of the project
- Computers communicate each other because they share the same "language" (a part the kernel, see next slides)
- 70s and 80s: UNIX not usable on microcomputers (like PCs), too slow

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- The Linux project has grown into a mature and powerful OS
- Linux is developed and distributed under the GNU General Public License (GPL)
- The GNU project (www.gnu.org) was founded in 1984 with the goal of developing high quality, free software
- GNU is a recursive acronym for "GNU's Not UNIX''

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- **powerful** and **secure**

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- They all use the Linux kernel:
  - Ubuntu
  - Fedora
  - SuSe Linux
  - Debian
  - CentOS
  - ...
- Compatible each other

User commands	
Shell	
Kernel	File Systems
	Device Drivers
Hardware	
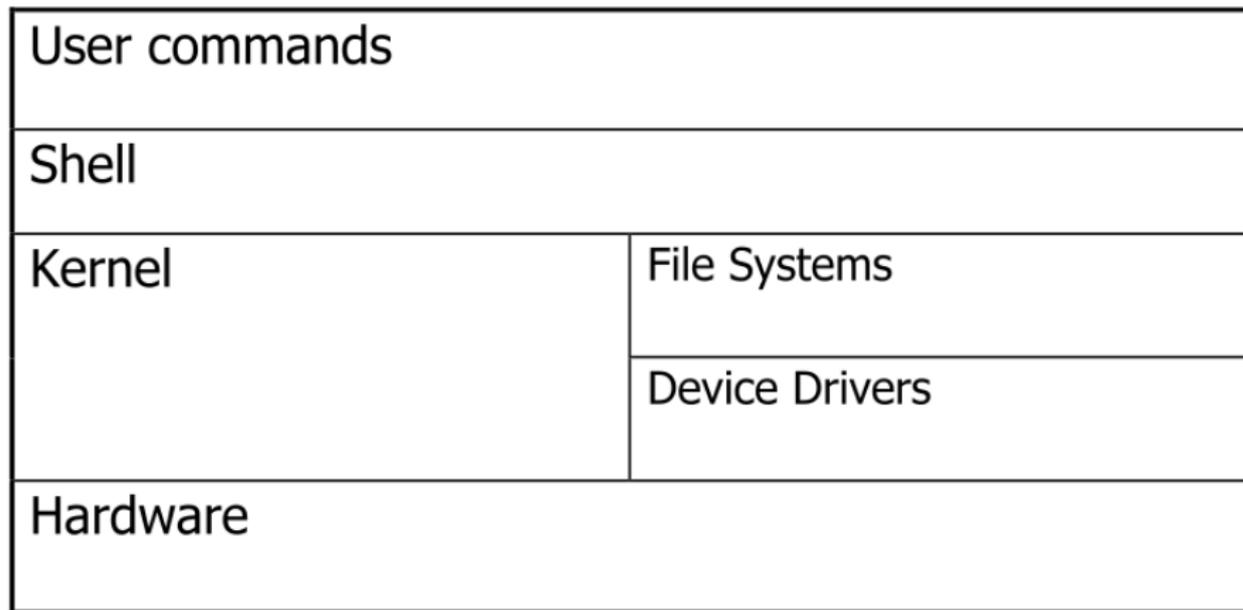
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- The kernel manages the hardware resources for the rest of the system

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- Bash is popular and easy to use

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- They allow software to interact with a device driver

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- Hierarchical filesystem
- Only one root (/)
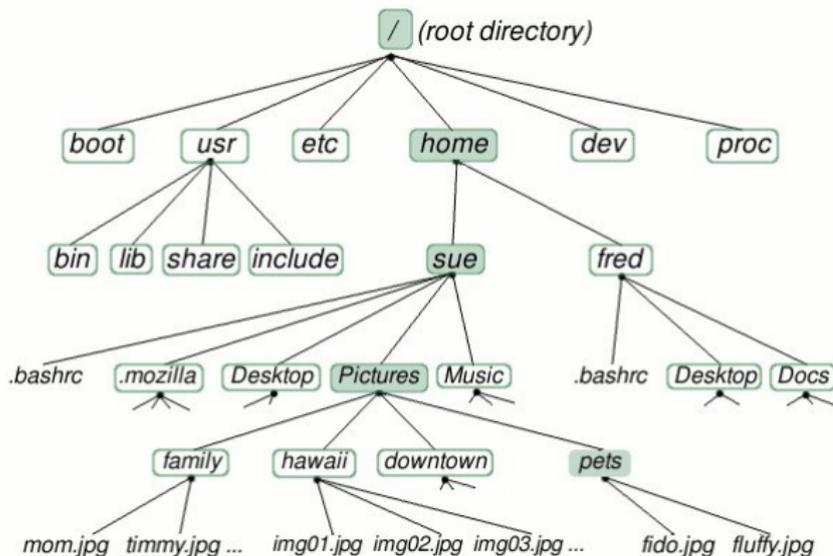
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- Directories are simply files containing other files

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- /var $\rightarrow$ various other files: mail, web server etc.
- /opt $\rightarrow$ extra software

Initial setup

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- Follow instructions on Moodle to connect to dscfalpha6

How to launch a Linux command

- Synopsis of any Linux command:
  command name options (flags) arguments

Text editors

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- vi (vim) $\rightarrow$ vimtutor
  Type vimtutor in the terminal

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- **history**: chronology of commands
- **exit (logout)**: close the actual session
- **man**: manual and info of commands

- $/ \rightarrow$ The root directory

Special file names

- $/ \rightarrow$ The root directory
- $. \rightarrow$ The current directory
- $.. \rightarrow$ The parent (previous) directory
- $\sim \rightarrow$ My home directory

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- **grep**: find and display a string in a given file

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- **find**: searches for files in a directory hierarchy
- **bc -l**: calculator

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- **which**: locates a command

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- chmod, chown and chgrp