

Linux Unchained

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Young Scientist Workshop 2016, Ringberg

Outline

Introduction

Essential Tips

General Tips

Conclusions

My Project: Loopedia

Loopedia

- Wikipedia-like database of Feynman integrals and references
- Analytic Results important for precision calculations
- Public lookup and search
- Upload only by registered users

Drupal

- Content Management System in PHP
- Pros
 - Automatic html generation
 - SQL Database access
 - Built-in user administration
- Hooks → custom functions → edit associative arrays

How to become a computer expert?

Google is your friend!

- Use key words
(Exception: error message)
- Evaluate search result:
 - Proximity to your problem
 - Age of result
 - Ease of solution
- Repeat

When in doubt: [stackoverflow](#).

Command Line (Bash)

Unleash the secret power of your computer:
Speak the right language.

- Better program operation:
Control exactly what they do.
- Computer works for you:
Write scripts for tedious/boring tasks.
- Better understanding of what your computer does:
Get more and detailed feedback.

Where to begin?

Guides:

- Modern Bash guide:
<http://mywiki.woledge.org/BashGuide>
Other guides teach outdated commands.
- The Linux Command Line, by W. Shotts
<http://linuxcommand.org/tlcl.php>

Specific questions:

- Ubuntuusers Wiki (German)
<https://wiki.ubuntuusers.de>
- Manpages: 'man command'

Several Tips for Bash

Starting questions:

- Where am I? → `pwd`
- What is around me? → `ls`
- How to go somewhere? → `cd path`
- Who am I? → `whoami`

Key concepts:

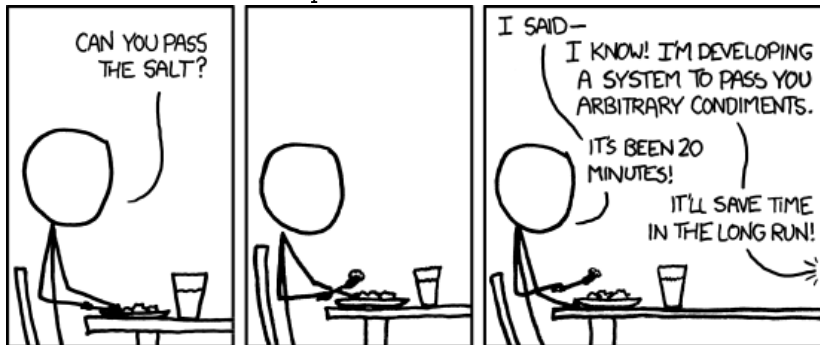
- “All is string”
- Variables “parameters”
- Parameter expansion (e.g. “`${var/pattern/replace}`”)
- A lot of useful functionality to handle (text-)files

Several Tips for Bash 2

- For scripts: usual control mechanisms: loops, if/else, ...
- String manipulation:
 - `sed 's/Search string/replace string/g'`
 - Important: the character after `s` can be *anything*!
- Data in text files as columns: `awk`
- `ssh login@pclXXX.mpp.mpg.de`
- File permissions:
`chmod go-rw file1 file2 ...`
`chmod -R go-rw folder1 folder2 ...`

“The General Problem”

<http://xkcd.com/974/>



Version Control

Version control is super useful! Especially for text files.
Snapshots!

- Almost anything you can do with snapshots
- Complete Modification History
- Cooperation: Who did what, when, and why.
- Branching
 - Several copies at the same time
 - Safe testing
 - Structure development
- Backup

Git Vocabulary

- **history:** collection of all snapshots and their relationships
- **repository:** collection of files (folder) managed by git, including history
- **commit:** snapshot, containing useful information like author, time, commit message, ...
- **branch (master):** (separate) chain of snapshots
- **remote (origin):** (central) repository
- **push/pull/clone:** synchronize with remote
- **.gitignore:** ignore certain files
- **working directory:** currently visible files in repository, ready for work
- **check out:** write files from certain snapshot to working directory
- **staging area:** control what will be included in next snapshot

Git Tips

- Github/Bitbucket: free repository hosting
- Github interactive online tutorial: <https://try.github.io>
- Git gui: specify exactly what to commit
- Gitk: browse history comfortably
- Commit messages:
 - Why change?
 - Work with others (future self)
 - Useful Guide:
<http://chris.beams.io/posts/git-commit/>

<http://xkcd.com/1296/>



	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

Regular Expressions

Regex is pattern matching!

- Used in grep, sed, text editors and other programs
- Careful: no standard
- Flexible search for patterns
- Mostly search and replace
- Quick guide: Chapter 19 of “The Linux Command Line”

Text Editor

Useful Properties:

- syntax highlighting
- auto completion
- snippets
- text navigation
- search/replace
- code folding

Recommendations:

- Emacs
- Vim
- Atom (Github)
- [insert your favorite text editor]

Conclusions:

- Google is your friend.
- The command line is the language of your computer.
- Put *everything* under Git.
- Emacs is the *only* editor you need!

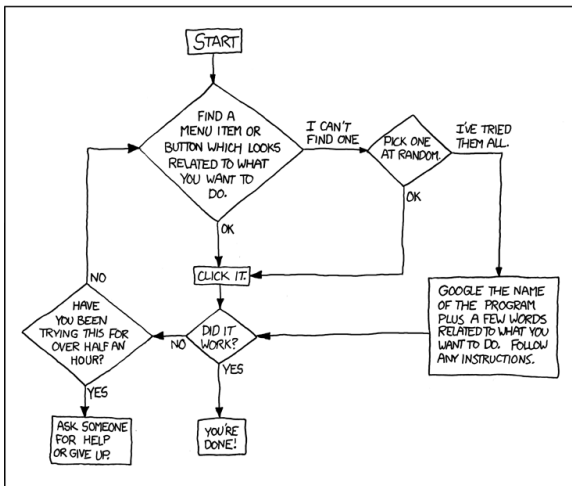
Outlook:

- Do not fear your computer!
- Be open to new stuff!

<http://xkcd.com/627/>

DEAR VARIOUS PARENTS, GRANDPARENTS, CO-WORKERS,
AND OTHER "NOT COMPUTER PEOPLE."

WE DON'T MAGICALLY KNOW HOW TO DO EVERYTHING IN EVERY
PROGRAM. WHEN WE HELP YOU, WE'RE USUALLY JUST DOING THIS:



PLEASE PRINT THIS FLOWCHART OUT AND TAPE IT NEAR YOUR SCREEN.
CONGRATULATIONS; YOU'RE NOW THE LOCAL COMPUTER EXPERT!