

```
$ figlet -f small "Shell for Fun and Profit"
```

```
  --- -      - -      --      ---  
/  _ | | _  _ _ | | | /  _ | _ _ _ _ | _ _ | _ _ _ _  
\  _ \ ' \ / - ) | | | \  _ \ ' | | _ | | | | ' \  
| _ _ / | | \ _ _ | | | | | \ _ _ / | | | | \ , _ | | | |
```

```
  - - - - -      -      - - - -      - - - - -  
/  _ ' | ' \ / _ ' | | _ / ' / _ \ _ | | | _ |  
\  _ , _ | | | \ _ , _ | | _ | | | \ _ _ / | | | \ _ |
```

Dieser Vortrag

Konfuse Liste von Herzensangelegenheiten

Bauchgefühl

Hoffentlich nicht *terrible*

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TL;DR: Shell lernen = Fun and Profit

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Bauchgefühl

Hoffentlich nicht *terrible*

TL;DR: Shell lernen = Fun and Profit

Gern interagieren :)

Fragen in die Runde

Semester? Studiengang?

Wer nutzt meist Windows? Mac? Linux?

Vorerfahrung?

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Semester? Studiengang?

Wer nutzt meist Windows? Mac? Linux?

Vorerfahrung?

Terminal lesbar?

```
$ cowsay -f milk Motivation
```

```
-----  
< Motivation >  
-----  
\  
\  
  |-----|  
  /         \  
 /         \  
/-----/  
|         |  
|  ==\  /==  |  
|   0   0   | \  
|    <    | \  
/|  \-----/ | / / |  
//|         | / / |  
/|||         | / | \ |  
-----|  
  | |     | |  
  <_ _ /   \_ _ >
```

GoPro Camera File Naming Convention

Oct 20, 2022

Recording Type	Filename	Example
Chaptered Video	<p>GHzzxxx.mp4 GXzzxxx.mp4</p> <ul style="list-style-type: none">• "H" = AVC encoding• "X" = HEVC encoding• 'xxx' = file number• 'zz' = chapter number	<p>GH01234.mp4 (first video) GH021234.mp4 (2nd chapter of the same video)</p>



DevOps Borat

@DEVOPS_BORAT

Big Data is any thing which is crash Excel.

6:25 PM · Jan 8, 2013

1,877 Retweets **21** Quotes **660** Likes **2** Bookmarks



```
$ cowsay demo
```

```
-----  
< demo >
```

```
-----
```

```
  \      ^ _ ^  
  \      (oo)\_-----  
      ( _ )\           )\/\   
          ||-----w |  
          ||           ||
```

Basics

- ▶ `., ..`
- ▶ `ls, cd`
- ▶ `touch, mkdir, cp, rm, mv`
- ▶ `*, ?`
- ▶ `man`
- ▶ `cat, head, tail`
- ▶ `sort, uniq, grep`
- ▶ `>, >>, <, |, $(...), <(...)`
- ▶ `if, for, ||, &&`
- ▶ `$var`
- ▶ `&`
- ▶ `strg + r`

c.f. [Key Points: Shell, Git, ...](#)

Powertools

- ▶ vim: *der* Texteditor. Gibt's als VS Code Plugin.
- ▶ ranger: Filemanager mit vim-keys
- ▶ find: listet Dateien auf
- ▶ diff, vimdiff: Unterschiede zwischen Dateien
- ▶ make: simples build system
- ▶ curl: http tool
- ▶ jq: json tool
- ▶ pandoc: document converter
- ▶ yt-dlp: youtube (etc) downloader
- ▶ ffmpeg: audio/video tool
- ▶ imagemagick: image tool
- ▶ git: VCS

- ▶ R, gnuplot, matplotlib
- ▶ PHP

- ▶ shellcheck

```

    .=gp.
  ./$$$$
|| "TP"
||
||      .:
||      .-' |
||      .-' |
||      |      !____
||      |      .-'  .-'
||      |      .____.'(
||      \ / /__\
||      )(
|::| /__\
|::|

```

```

+-----+
| Demo |
+-----+
  ||
  ||
  ||

```

fsc

Footguns

ValveSoftware / steam-for-linux #3671

Footguns

ValveSoftware / steam-for-linux #3671

Klassiker

Inputs, die mit - beginnen, e.g. -bar

Quoting von Variablen

Command fails, execution continues

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Inputs, die mit - beginnen, e.g. -bar

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Command fails, execution continues

Nutzt shellcheck!

Warum Shell/UNIX lernen?

Personal Computing

Shell interaktiv, effektiv

(Fast) alles wird programmierbar / “Apple-Effekt”

Kein jpg2png.com, pdf-merge.com, ... mehr

Zinseszins

JS-Frameworks kommen und gehen, POSIX bleibt

Right Tool for the JobTM

Blub-Paradoxon

hypothetical language “Blub” in the middle of the abstractness continuum.

A Blub programmer **looking down** the power continuum **knows** he's looking down.

A Blub programmer **looking up** the power continuum **doesn't realize** he's looking up. What he sees are merely weird languages. **He probably considers them about equivalent** in power to Blub, but with all this other hairy stuff thrown in as well. Blub is good enough for him, because he **thinks in Blub**.

Blub-Paradoxon abstracted

Well, es gibt *unknown unknowns*.

Tretroller vs Fahrrad

- ▶ Geschwindigkeit
- ▶ Preis

C vs Rust

- ▶ *Wat hab ich davon?*
- ▶ *Was kostet mich das lernen?*

Werkzeuge

Turing-Vollständigkeit

Domäne	Problem	Werkzeug
Holz schneiden	Modellbau	Laubsäge
Holz schneiden	Baum fällen	Kettensäge
Daten verarbeiten	Webshop	LAMP
Daten verarbeiten	mp3s konkatenieren	shell

Knuth vs McIlroy

Read a file of text, determine the n most frequently used words, and print out a sorted list of those words along with their frequencies.

Knuth vs McIlroy: Knuth's solution

A LITERATE PROGRAM

Last month's column introduced Don Knuth's style of "Literate Programming" and his WEB system for building programs that are works of literature. This column presents a literate program by Knuth (its origins are sketched in last month's column) and, as befits literature, a review. So without further ado, here is Knuth's program, retypeset in Communications style. —Jon Bentley

Common Words	Section
Introduction	1
Strategic considerations	8
Basic input routines	9
Dictionary lookup	17
The frequency counts	32
Sorting a trie	36
The endgame	41
Index	42

1. Introduction. The purpose of this program is to solve the following problem posed by Jon Bentley:

Given a text file and an integer k , print the k most common words in the file (and the number of their occurrences) in decreasing frequency.

Jon intentionally left the problem somewhat vague, but he stated that "a user should be able to find the 100 most frequent words in a twenty-page technical paper (roughly a 50K byte file) without undue emotional trauma."

frequency; or there might not even be as many as k words. Let's be more precise: The most common words are to be printed in order of decreasing frequency, with words of equal frequency listed in alphabetic order. Printing should stop after k words have been output, if more than k words are present.

2. The *input* file is assumed to contain the given text. If it begins with a positive decimal number (preceded by optional blanks), that number will be the value of k ; otherwise we shall assume that $k = 100$. Answers will be sent to the *output* file.

```
define default_k = 100 {use this value if k isn't  
otherwise specified}
```

3. Besides solving the given problem, this program is supposed to be an example of the WEB system, for people who know some Pascal but who have never seen WEB before. Here is an outline of the program to be constructed:

```
program common_words (input, output);  
type <Type declarations 17>  
var <Global variables 4>  
<Procedures for initialization 5>  
<Procedures for input and output 9>  
<Procedures for data manipulation 20>  
begin <The main program 8>;  
end.
```


Knuth vs McIlroy: McIlroy's solution

```
tr -cs A-Za-z '\n' |  
tr A-Z a-z |  
sort |  
uniq -c |  
sort -rn |  
sed ${1}q
```

Knuth vs McIlroy: Aside

Possible reading: *Knuth is an idiot*

But: Knuth was framed

Context matters!

(Accompanying ACM article)

Werkzeuge

Mensch nutzt Werkzeug um Umwelt zu beeinflussen.

Tool	Dev Env	Umwelt
Excel	Tabelle	Tabelle
“Progra-like” Java	IDE	Aufgabe
Unix	Shell	Dateisystem, OS
Jupyter	Notebook	CSV, Plots
Backend Webdev	IDE, Postman	REST, ORM/SQL
C / C++ / Rust	IDE, perf	Hardware

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Kontext

Werkzeuge

Each [tool] has its purpose, however humble. Each [tool] expresses the Yin and Yang of software. Each [tool] has its place within the Tao.

The Tao of Programming

Demo: ytp

Lernen

Nextcloud o.ä. Self-hosten

Hardware

Home

0. Internetzugang mit IPv4
1. Hardware: RasPi / alter Laptop
2. Ubuntu LTS installieren
3. `ssh` einrichten
4. *Port forwarding* am Router einstellen

Cloud

1. Mini-Instanz bei Hetzner, NetCup ([Sale!](#)), ...

Setup

1. DynDNS-Dienst raussuchen, einrichten
2. TLS-Zertifikat von Let's Encrypt holen
3. Nextcloud o.ä. nach Rezept installieren

Linux als Daily Driver

1. Laptop beschaffen:
 - ▶ Alten Laptop rumliegen haben
 - ▶ Gebrauchten Business-Laptop holen (z.B. *Dell Latitude, Lenovo X240 / T440*)
 - ▶ All-in gehen
 - ▶ Dual boot
2. Distro raussuchen (z.B. *Ubuntu, Manjaro*)
3. Benutzen
 - ▶ Customizen
 - ▶ Scripten
 - ▶ ricing (c.f. [/r/unixporn](#))
 - ▶ Informieren: YouTube, Reddit, ...

Mein Setup bis neulich

Distro	Manjaro
window manager	i3
Editor	vim
File manager	ranger
Music Player	Erst moc, dann mpd mit ncmpcpp
Video Player	mpv
PDF reader	zathura
Mailprogramm	mutt
Todos	todoman mit vdirsyncer
Password Manager	pass
Moodle Syncer	syncMyMoodle

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Btw: isia bzw. isisd

Strategien

auf Linux *angewiesen* sein

Lernprokrastination

Lieber 10h scripten/lernen als 10 * 10 min klicken

Lesen: `man(1)`, Bücher, Blogs

Verschränkungen

Resourcen

- ▶ Key Points: Shell, Git, ...
- ▶ ChatGPT
- ▶ The Missing Semester
- ▶ Software Carpentry Tutorial: Shell
- ▶ The AWK Programming Language, insb. *Chapter 1*.
- ▶ AT&T Archives: The UNIX Operating System

Für Linux

- ▶ Arch Wiki