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OS 1 – Intro

The lecture is based on the work and the documents of Prof. Dr. Ludwig Frank

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Intro

Material for lecture and exercises:

`https://inf-git.fh-rosenheim.de/kufl174/OS_exercises`

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OS tasks

Which operating systems do you know?

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OS tasks

What are the tasks of an operating system?

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OS

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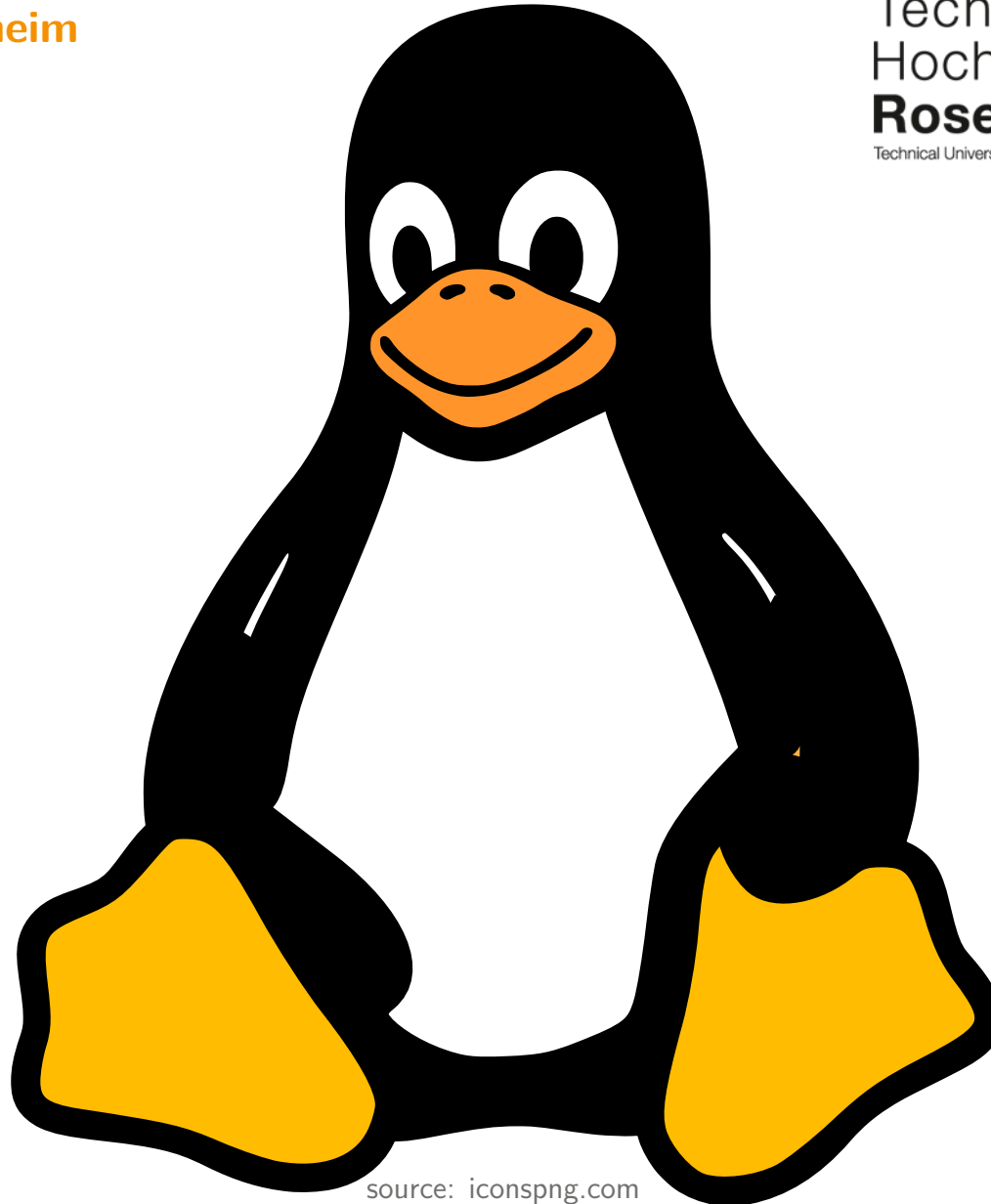
Goal
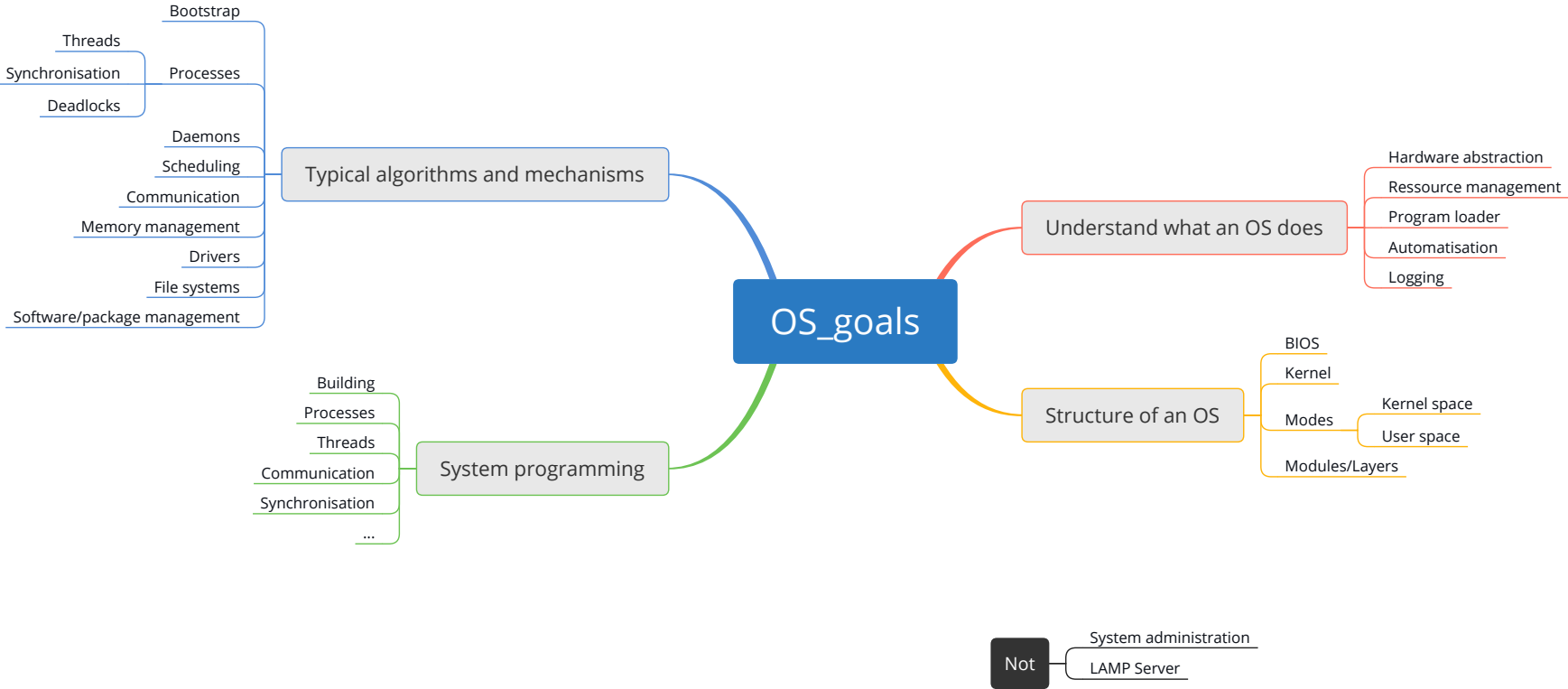
Module

SPO 2012 vs. SPO 2018

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Equipment

Check equipment: smartphone, tablet, notebook!

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Exercises

Exercise groups:

- Group 0: Tuesday,   9:45 - 11:15, B0.08a???
- Group 1: Tuesday, 11:45 - 13:15, B0.08a
- Group 2: Tuesday, 13:45 - 15:15, B0.08a
- Group 3: Tuesday, 15:30 - 17:00, B0.08a

Exercise content:

- Shell scripting (bash)
- Linux system programming with C
- Theoretical tasks
- **Homework is also necessary!!!**

Equipment:

- Everyone needs a PC (notebook) with a virtual machine (VirtualBox or VMware)
- There are some notebooks to borrow (up to 5)

Linux shell

The shell (terminal) is a
- command line **interpreter** and a
- **interface** to the Linux **kernel**

We use the **bash** as the main shell (terminal).

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Linux prompt

```
flo@flo-nbw␣/data/repos/repos_fh/BS.git$
```

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Linux shell 101

A short Linux shell (bash) introduction...

- **Directories**: show, change, create, remove
- **Files**: create, show, move, remove
- **Commands**: man (help), execute, execute as root (sudo)

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Linux shell 101 - directories

```
1  ls               #list directory content
2  ls -l            #list directory content - show details
3
4  cd ..            #change to parent directory (relative)
5  cd sub1          #change to sub directory (relative)
6  cd /var/log      #change to directory (absolute)
7
8  #paths:
9  #relative:   file
10 #            ./file
11 #            ../file
12 #absolute:   /path/to/file
13
14 mkdir newdir     #create directory
15 rm -r sub1       #removes sub1 directory (recursive)
```

Linux shell 101 - files

```
1  cat file      #shows the content of file
2  tail file     #shows the last 10 lines of file
3  tail -f file  #shows the last 10 lines of file and follow the lin
4
5  touch file    #creates an empty file
6
7  rm file       #removes file
8  mv file file2 #renames file to file2
9  mv file sub/  #moves file to the sub/ directory
```

Linux shell 101 - commands

```
1  <command> -h          #inline help for command
2  <command> --help      #inline help for command
3  man <command>         #manpage (Handbuch) command
4
5  <command>             #executes command that is known by linux
6  ./<command>           #executes a command in the current folder
7
8  sudo <command>        #executes command with root rights
```

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Literature (1) - Betriebssysteme

Moderne Betriebssysteme

Author(s)   Andrew S. Tanenbaum, Herbert Bos
Date   03. Mai 2016
Edition   4. edition
Language   German
ISBN   978-3868942705
Reference   [1]

[source: amazon.de]
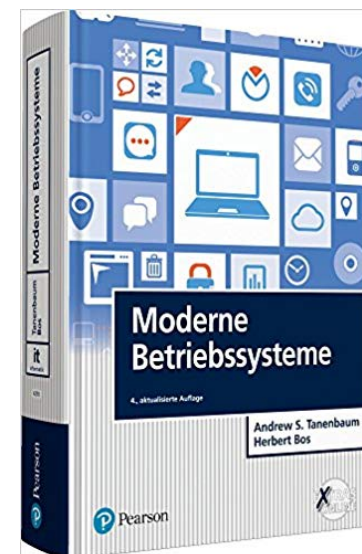
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Literature (2) - Linux shell

Bash Reference Manual

Author(s)   GNU
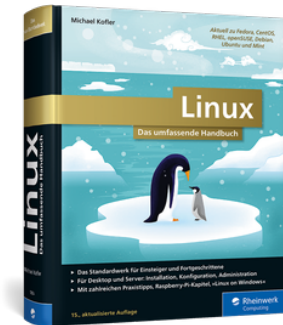Date   20. May 2019
Language   English
Reference [2]
Link   `https://www.gnu.org/software/bash/manual/`

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Literature (3) - Linux shell

Linux: Das umfassende Handbuch
Für alle aktuellen Distributionen (Desktop und Server)

Author(s)	Michael Kofler
Date	29. September 2017
Edition	15. edition
Language	German
ISBN	978-3836258548
Reference	[3]
Link	`http://openbook.rheinwerk-verlag.de/linux/index.html`

[source: `https://www.rheinwerk-verlag.de/linux_2963/`]

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Literature (4) - Linux shell

Ubuntuusers Befehlsübersicht

Author(s)   Ubuntuusers
Language   German
Reference   [4]
Link   `https://wiki.ubuntuusers.de/Shell/Befehlsübersicht/`

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Summary and outlook

Summary

- OS tasks

- Linux shell intro

- Linux prompt

- Linux shell 101

Outlook

- Build on command line

- ELF

- Makefile

- Autotools