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Bachelorarbeit

Is Oil the future?

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Abstract

<Short summary of the thesis>

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ER error rate. 38

FR Fehlerrate. 38

RDBMS Relational Database Management System. 38

1 Introduction

This thesis tarts with Chapter 2.

We can also typeset `<text>verbatim text</text>`. Backticks are also rendered correctly: `` `words in backticks` ``.

2 Chapter Two

LaTeX hints are provided in Appendix A.

3 Heading on Level 0 (chapter)

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

3.1 Heading on Level 1 (section)

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

3.1.1 Heading on Level 2 (subsection)

Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. If you read this text, you will get no information. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

Heading on Level 3 (subsubsection)

Hello, here is some text without a meaning $E = mc^2$. This text should show what a printed text will look like at this place. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. If you read this text, you will get no information. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information

about the selected font, how the letters are written and an impression of the look. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. There is no need for special content, but the length of words should match the language.

Heading on Level 4 (paragraph) Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

3.2 Lists

3.2.1 Example for list (itemize)

- First item in a list
- Second item in a list
- Third item in a list
- Fourth item in a list
- Fifth item in a list

Example for list (4*itemize)

- First item in a list
  - First item in a list
    - First item in a list
      - First item in a list
      - Second item in a list
    - Second item in a list
  - Second item in a list
- Second item in a list

3.2.2 Example for list (enumerate)

1. First item in a list
2. Second item in a list
3. Third item in a list
4. Fourth item in a list
5. Fifth item in a list

Example for list (4*enumerate)

1. First item in a list
    a) First item in a list
        i. First item in a list
            A. First item in a list
            B. Second item in a list
        ii. Second item in a list
    b) Second item in a list
2. Second item in a list

3.2.3 Example for list (description)

First item in a list

Second item in a list

Third item in a list

Fourth item in a list

Fifth item in a list

Example for list (4*description)

First item in a list

First item in a list

First item in a list

First item in a list

Second item in a list

Second item in a list

Second item in a list

Second item in a list

4 Conclusion and Outlook

Outlook

A LaTeX Hints

> Probleme kann man niemals mit derselben Denkweise lösen, durch die sie entstanden sind.
>
> *(Albert Einstein)*

One sentence per line. This rule is important for the usage of version control systems. A new line is generated with a blank line.

Please do *not* use double backslahes for new paragraphs. For instance, this sentence belongs to the same paragraph, whereas the last one started a new one. A long motivation for that is provided at `http://loopspace.mathforge.org/HowDidIDoThat/TeX/VCS/#section.3`.

A.1 File Encoding and Support of Umlauts

The template offers foll UTF-8 support. All recent editors should not have issues with that.

A.2 Citations

Referenzen werden mittels `\cite[key]` gesetzt. Beispiel: [WCL+05] oder mit Autorenangabe: Weerawarana et al. [WCL+05].

Der folgende Satz demonstriert 1. die Großschreibung von Autorennamen am Satzanfang, 2. die richtige Zitation unter Verwendung von Autorennamen und der Referenz, 3. dass die Autorennamen ein Hyperlink auf das Literaturverzeichnis sind sowie 4. dass in dem Literaturverzeichnis der Namenspräfix "van der" von "Wil M. P. van der Aalst" steht. Reijers et al. [RVA16] präsentieren eine Studie über die Effektivität von Workflow-Management-Systemen.

Der folgende Satz demonstriert, dass man mittels `label` in einem Bibliopgrahie-Eintrag den Textteil des generierten Labels überschreiben kann, aber das Jahr und die Eindeutigkeit noch von biber generiert wird. The workflow engine Apache ODE [ASF16] executes BPEL processes reliably.

Wörter am besten mittels `\enquote{...}` "einschließen", dann werden die richtigen Anführungszeichen verwendet.

Beim Erstellen der Bibtex-Datei wird empfohlen darauf zu achten, dass die DOI aufgeführt wird.

Listing A.1 Inn a Listings environment the code is separated by two horizontal lines.

```
<listing name="second sample">
  <content>not interesting</content>
</listing>
```

A.3 Formulas and Equations

Equations $f(x) = x$ inside the text can be provided. A list with all available mathematical symbols is provided at http://texdoc.net/pkg/symbols-a4. As example the set of natural numbers is given by $\mathbb{N}$. For the documentation of editing mathematical formulas read the package documentation of amsmath[1].

Following equation is not numbered because of using \align* as environment.

$$x = y$$

Equation A.1 is numbered and can be referenced in the text:

$$x = y \tag{A.1}$$

The template offers \abs to enable the bars scaling well at the absolute value: $|X|$.

More details about mathematical environments provides this documentation[2].

A.4 Sourcecode

Listing A.1 shows how to emmbed source code. With \lstinputlisting the source code can be loaded directly from files.

Source code is also available in the text <listing />.

A.5 Pseudocode

Algorithm A.1 zeigt einen Beispielalgorithmus.

[1] http://texdoc.net/pkg/amsmath

[2] http://www.ctan.org/tex-archive/help/Catalogue/entries/voss-mathmode.html

Algorithm A.1 Sample algorithm

procedure SAMPLE(a,v_e)
  parentHandled $\leftarrow$ (a = process) $\vee$ visited(a'), $(a', c, a) \in$ HR
    // $(a', c'a) \in$ HR denotes that a' is the parent of a
  if parentHandled $\wedge$ ($\mathcal{L}_{in}(a) = \emptyset \vee \forall l \in \mathcal{L}_{in}(a)$: visited(l)) **then**
    visited(a) $\leftarrow$ true
    $$\text{writes}_{\circ}(a, v_e) \leftarrow \begin{cases} \text{joinLinks}(a, v_e) & \left|\mathcal{L}_{in}(a)\right| > 0 \\ \text{writes}_{\circ}(p, v_e) & \exists p : (p, c, a) \in \text{HR} \\ (\emptyset, \emptyset, \emptyset, false) & \text{otherwise} \end{cases}$$
    if $a \in \mathcal{A}_{basic}$ **then**
      HANDLEBASICACTIVITY(a,v_e)
    else if $a \in \mathcal{A}_{flow}$ **then**
      HANDLEFLOW(a,v_e)
    else if a = process **then** // Directly handle the contained activity
      HANDLEACTIVITY(a',v_e), $(a, \perp, a') \in$ HR
      writes$_{\bullet}(a) \leftarrow$ writes$_{\bullet}(a')$
    end if
    for all $l \in \mathcal{L}_{out}(a)$ **do**
      HANDLELINK(l,v_e)
    end for
  end if
end procedure

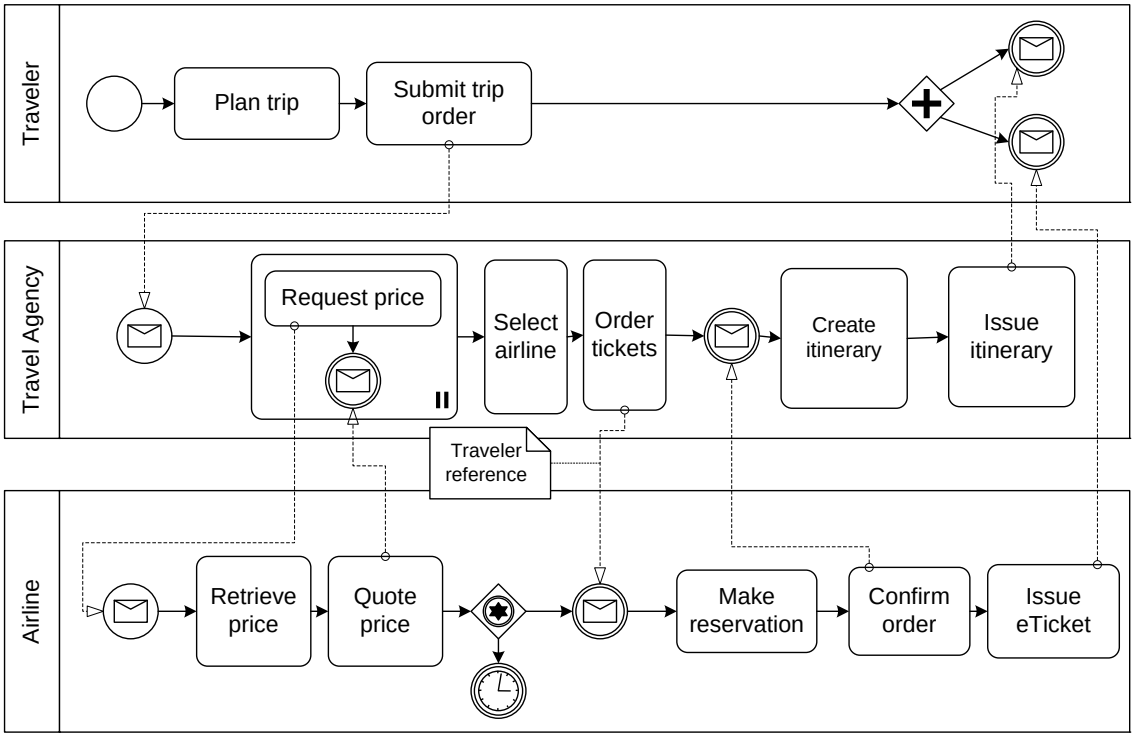


Figure A.1: Beispiel-Choreographie

Und wer einen Algorithmus schreiben möchte, der über mehrere Seiten geht, der kann das nur mit folgendem **üblen** Hack tun:

Algorithmus A.2 Description

code goes here
test2

A.6 Figures

Die Figure A.1 und A.2 sind für das Verständnis dieses Dokuments wichtig. Im Anhang zeigt Figure A.4 on page 32 erneut die komplette Choreographie.

Figure A.3 shows the usage of the package subcaption. It is indeed possible to reference to sub figures: Figure A.3a.

Es ist möglich, SVGs direkt beim Kompilieren in PDF umzuwandeln. Dies ist im Quellcode zu latex-tipps.tex beschrieben, allerdings auskommentiert.

A.7 More Illustrations

Figures A.4 and A.5 zeigen zwei Choreographien, die den Sachverhalt weiter erlÃ¤utern sollen. Die zweite Abbildung ist um 90 Grad gedreht, um das Paket `pdflscape` zu demonstrieren.

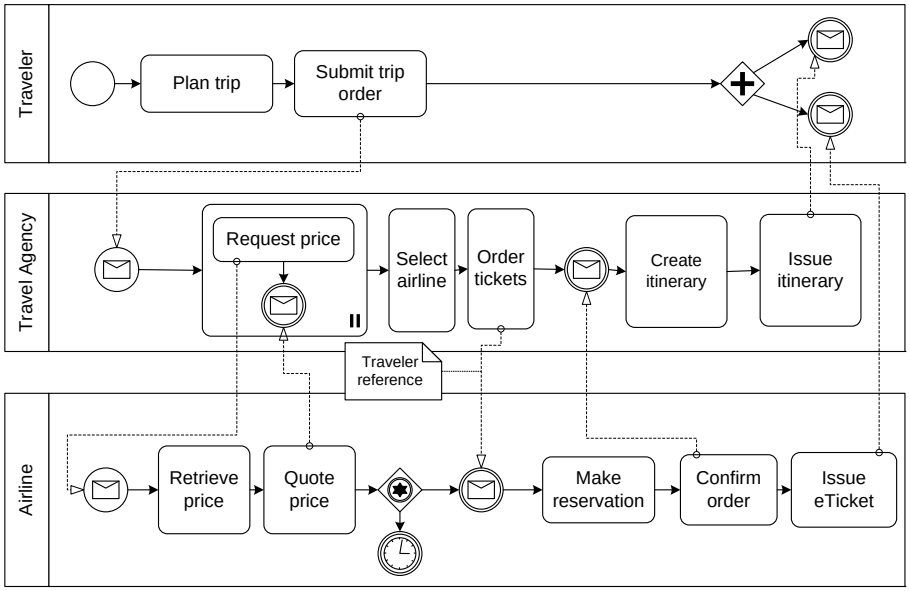
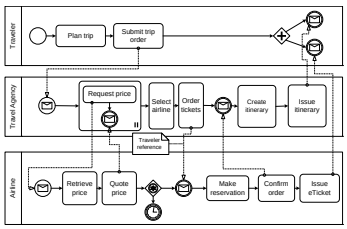
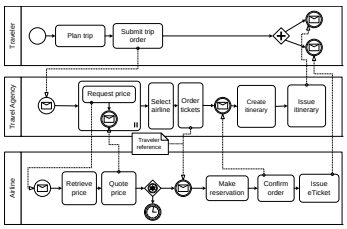


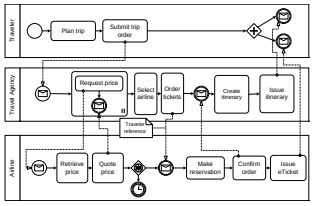
Figure A.2: Die Beispiel-Choreographie. Nun etwas kleiner, damit `\textwidth` demonstriert wird. Und auch die Verwendung von alternativen Bildunterschriften für das Verzeichnis der Abbildungen. Letzteres ist allerdings nur Bedingt zu empfehlen, denn wer liest schon so viel Text unter einem Bild? Oder ist es einfach nur Stilsache?



(a) Choreography 1



(b) Choreography 2



(c) Choreography 3

Figure A.3: Example to place 3 illustrations next to each other. Further, it is possible to reference each separately.

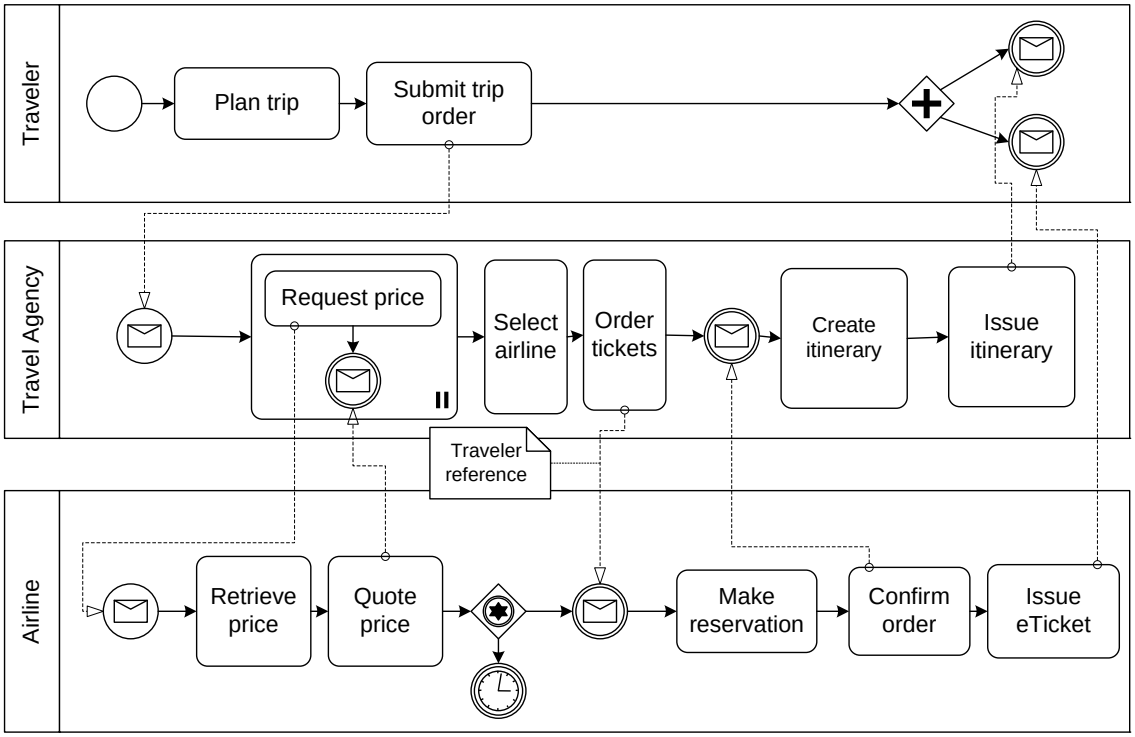


Figure A.4: Beispiel-Choreographie I

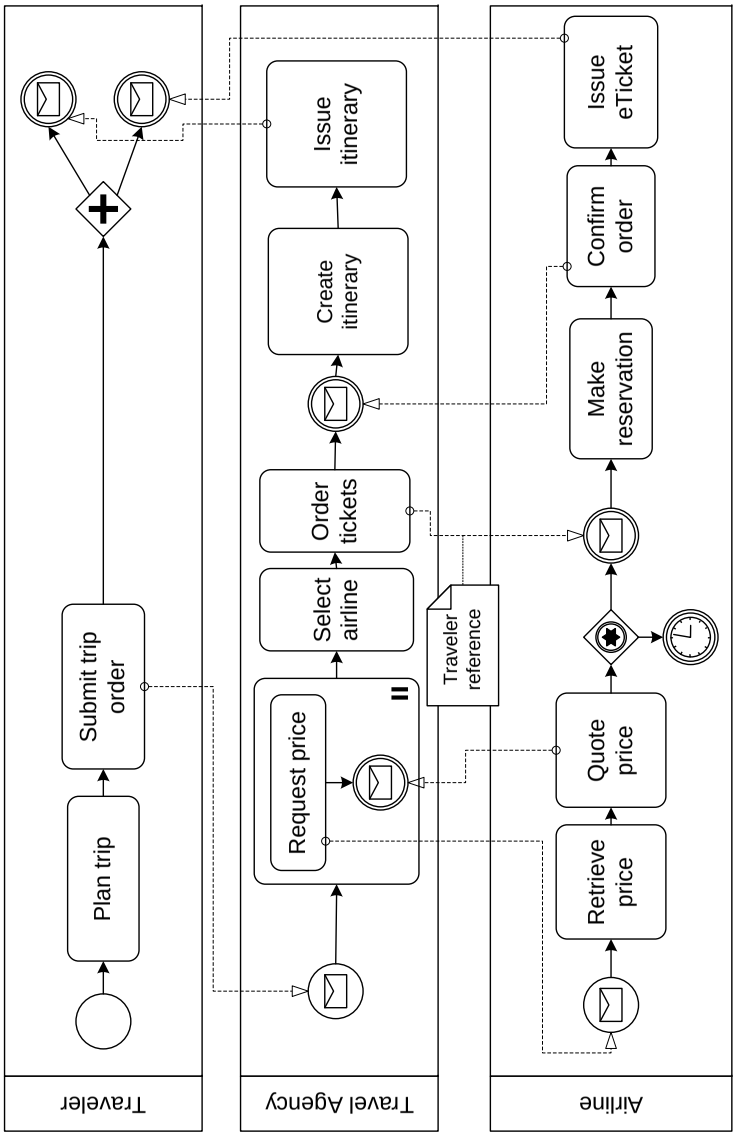


Figure A.5: Beispiel-Choreographie II

A.8 Plots with pgfplots

The package pdfplots provides plotting of functions directly in LaTeX like with matlab or gnuplot.

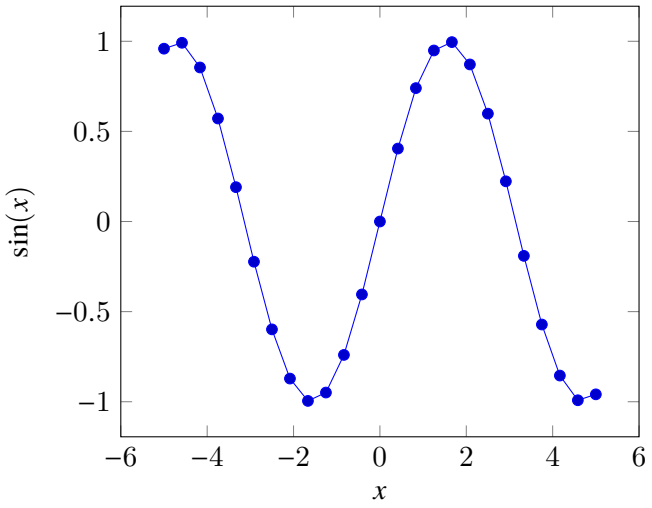


Figure A.6: Plot of $\sin(x)$ direclty inside the figure environment with pgfplots.

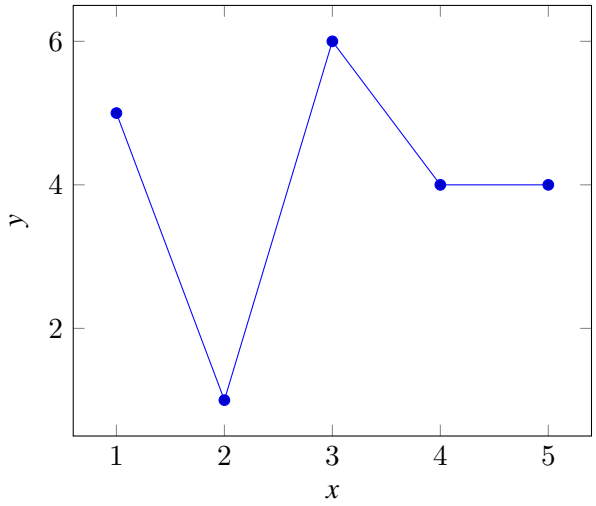


Figure A.7: Coordinates x and y read from csv file and plotted pgfplots.

A.9 Figures with tikz

The tikz is a package for creating graphics programmatically. With this package grids or other regular strucutres can be easliy generated.

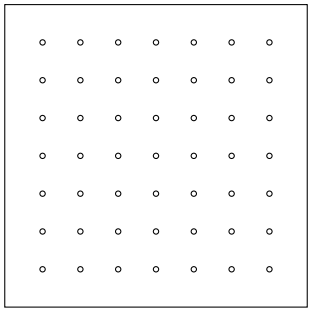


Figure A.8: A regular grid genrated with easily with two for loops.

zusammengefasst		Titel
Tabelle	wie	in
tabsatz.pdf	empfohlen	gesetzt
Beispiel	ein schönes Beispiel für die Verwendung von “multirow”	

Table A.1: Beispieltabelle – siehe http://www.ctan.org/tex-archive/info/german/tabsatz/

A.10 UML diagrams with tikz-uml

Figure A.9 presents a class diagram typeset using tikz-uml.

A.11 Tables

Table A.1 zeigt Ergebnisse und die Table A.1 zeigt wie numerische Daten in einer Tabelle repräsentiert werden können.

	Parameter 1		Parameter 2		Parameter 3		Parameter 4	
Bedingungen	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
W	1.1	5.55	6.66	.01				
X	22.22	0.0	77.5	.1				
Y	333.3	.1	11.11	.05				
Z	4444.44	77.77	14.06	.3				

Table A.2: Beispieltabelle für 4 Bedingungen (W-Z) mit jeweils 4 Parameters mit (M und SD). Hinweiß: immer die selbe anzahl an Nachkommastellen angeben.

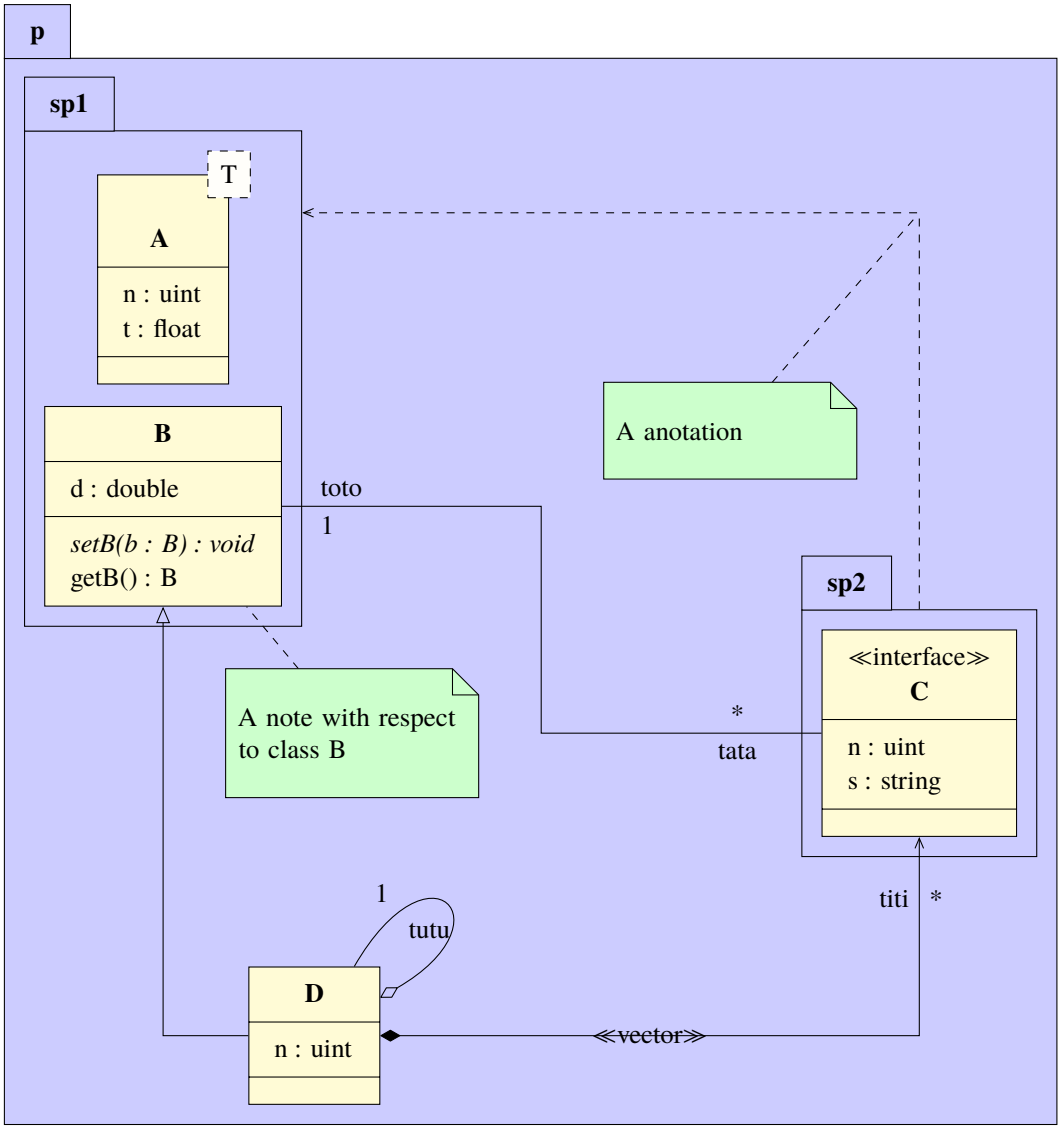


Figure A.9: Class diagram generated with tikz-uml. Example adapted from Nicolas Kielbasiewicz.

A.11.1 Tabellen mit pgfplots

With the pgfplotstable package tables can be directly generated from a csv file.

A.12 Tables spanning multiple pages

Table A.4: A sample long table.

First column	Second column	Third column
A	BC	D
Continued on next page		

Table A.4 – continued from previous page

First column	Second column	Third column
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
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A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D

Continued on next page

Table A.4 – continued from previous page

First column	Second column	Third column
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
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A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D
A	BC	D

	b	c	d
1	4	5	1
2	3	1	5
3	5	6	1
4	1	4	9
5	3	4	7

Table A.3: Tabelle direclty generated from the values of a csf file.

A.13 Abbreviations

Beim ersten Durchlauf betrug die Fehlerrate (FR) 5. Beim zweiten Durchlauf war die FR 3. Die Pluralform sieht man hier: error rates (ERs). Um zu demonstrieren, wie das Abkürzungsverzeichnis bei längeren Beschreibungstexten aussieht, muss hier noch Relational Database Management Systems (RDBMS) erwähnt werden.

Mit `\gls{...}` können Abkürzungen eingebaut werden, beim ersten Aufrufen wird die lange Form eingesetzt. Beim wiederholten Verwenden von `\gls{...}` wird automatisch die kurz Form angezeigt. Außerdem wird die Abkürzung automatisch in die Abkürzungsliste eingefügt. Mit `\glspl{...}` wird die Pluralform verwendet. Möchte man, dass bei der ersten Verwendung direkt die Kurzform erscheint, so kann man mit `\glsunset{...}` eine Abkürzung als bereits verwendet markieren. Das Gegenteil erreicht man mit `\glsreset{...}`.

Definiert werden Abkürzungen in der Datei *content ausarbeitung.tex* mithilfe von `\newacronym{...}{...}{...}`.

Mehr Infos unter: http://tug.ctan.org/macros/latex/contrib/glossaries/glossariesbegin.pdf

A.14 References

Für weit entfernte Abschnitte ist "varioref" zu empfehlen: "Siehe Appendix A.3 on page 28". Das Kommando `\vref` funktioniert ähnlich wie `\cref` mit dem Unterschied, dass zusätzlich ein Verweis auf die Seite hinzugefügt wird. `vref`: "Appendix A.1 on page 27", `cref`: "Appendix A.1", `ref`: "A.1".

Falls "varioref" Schwierigkeiten macht, dann kann man stattdessen "cref" verwenden. Dies erzeugt auch das Wort "Abschnitt" automatisch: Appendix A.3. Das geht auch für Abbildungen usw. Im Englischen bitte `\Cref{...}` (mit großen "C" am Anfang) verwenden.

A.15 Definitions

Definition A.15.1 (Title)
Definition Text

Definition A.15.1 zeigt …

A.16 Footnotes

Footnotes are provided by the command `\footnote{...}`[3]. Citing footnotes is possible by provinding a label`\footnote{\label{...}...}` and cite the footnote with `\cref{...}` in the text[3].

A.17 Verschiedenes

I. Man kann auch die Nummerierung dank paralist kompakt halten
II. und auf eine andere Nummerierung umstellen

The words “workflow” and “dwarflike” can be copied from the PDF and pasted to a text file. In case LuaLaTeX is used as compiler, there is no ligature at “ft” in the word “dwarflike” (in contrast to “fl” at “workflow”). In other words: “dwarflike” und “dwarflike” look the same in the PDF.

A.18 Closing remarks

Please feel free to provide enhancements for this template and create a new ticket on github (https://github.com/latextemplates/uni-stuttgart-computer-science-template/issues).

[3] Example footnote.

Bibliography

[ASF16] The Apache Software Foundation. *Apache ODE™ – The Orchestration Director Engine*. 2016. URL: http://ode.apache.org (cit. on p. 27).

[RVA16] H. Reijers, I. Vanderfeesten, W. van der Aalst. "The effectiveness of workflow management systems: A longitudinal study". In: *International Journal of Information Management* 36.1 (Feb. 2016), pp. 126–141. DOI: 10.1016/j.ijinfomgt.2015.08.003 (cit. on p. 27).

[WCL+05] S. Weerawarana, F. Curbera, F. Leymann, T. Storey, D. F. Ferguson. *Web Services Platform Architecture : SOAP, WSDL, WS-Policy, WS-Addressing, WS-BPEL, WS-Reliable Messaging, and More*. Prentice Hall PTR, 2005. ISBN: 0131488740. DOI: 10.1.1/jpb001 (cit. on p. 27).

All links were last followed on March 17, 2018.

Declaration

I hereby declare that the work presented in this thesis is entirely my own and that I did not use any other sources and references than the listed ones. I have marked all direct or indirect statements from other sources contained therein as quotations. Neither this work nor significant parts of it were part of another examination procedure. I have not published this work in whole or in part before. The electronic copy is consistent with all submitted copies.

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place, date, signature