Introduction to Scientific Working

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Summary of last proseminar

Kinds of texts (at least)

- Seminar work
  10–20 pages; Summary of existing scientific work
- Bachelor thesis
  15–30 pages; No claim about originality, but summarized achieved results
- Master thesis
  60–100 pages; Summary, explanation, and implementation of existing scientific work

Structure a paper

Table of contents

`\tableofcontents`

Introduction

Motivation and short form of the work

Main part, core

Description and discussion of various topics

Conclusion

Summary of the considered topics and their relation to the motivation

References

`\bibliographystyle{plain}`
`\bibliography{references}`

Introduction

Short summary and motivation

- Be very precise in the introduction
- The reader needs to have an idea what topics will be covered
- The introduction ends with a detailed content of the work
- To be written **at the end**
- (Same for the summary / conclusion)

Example

This document gives some hints on how to structure and organize a thesis. It does not contain explicit help on LaTeX. For that issue please refer to a short introduction in German [2] or a not so short introduction in English [1]. To ensure a uniform layout this note further fixes some conventions when typesetting in LaTeX and lists some useful packages.

Main part
Description and analysis of a topic

Structuring

- Divide the work into chapters, sections, subsections, so that each describes a logical part of the work
- Begin sections with a single sentence that introduces that part
- Avoid too long/short chapters

Formatting

- Words capitalized in titles also in English
- Use special environments for listings, tables, graphics, ...

Conclusion

Repeat the topic and analyse it again with respect to the motivation

- Summary of the results
- Compare the results with the motivation given in the introduction
- Mention what is your work again
- Possibly discuss potential future work and related works
- The conclusion should be written last

Example

This note gives a comprehensive guide for computational logic students on how to organize their scientific documents. In order to get started with LaTeX some useful packages are mentioned.

Literature

📄 T. Oetiker, H. Partl, I. Hyna, and E. Schlegl.
The not so short introduction to LaTeX, 2007.
`ctan.org/tex-archive/info/lshort/english`.

📄 W. Schmidt, J. Knappen, H. Partl, and I. Hyna.
LaTeX-Kurzbeschreibung, 2003.
`ctan.org/tex-archive/info/german/LaTeX2e-Kurzbeschreibung`.

Paper structure

- Introduction
- Core
- Conclusion

Formatting

- LaTeX takes care of most formatting
- Figures and tables require captions and references
- Headlines capitalized
- Use dedicated environments for listings, tables, graphics, etc.

Dedicated environments for (program) listings

```python
class HelloWorld:
    def name(self, name):
        return name

h = HelloWorld()
print(h.__class__.__name__)
```

Figure: Hello program in Python.

Example

Figure presents a "hello world" program in `Python` (often with references)

Checklist for the final document

Tasks

1 Use a spell-checker
Correct words in wrong places cannot be recognized

2 Line breaks and page breaks
Modify manually only in case of serious issues

3 Overfull lines
`draft` mode

4 Consistency of references
"Proc. of the 7th International conference . . ." versus
"8th Conference on . . ." versus
"Proceedings of the sixth . . ."
(names, numbers, abbreviations, ...)

5 Read through the complete document

Homework / Work here

- Read chapters 1–3 of "Not so short introduction to LaTeX"
  `https://tobi.oetiker.ch/lshort/lshort.pdf`
- Prepare a minimal LaTeX document that includes an itemization, a table, a figure, a mathematical formula, and bibtex bibliography.