Report Template

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1 PREFACE

This document serves two purposes: Firstly, it is a LaTeXtemplate, which can be copied and adapted to your report writing needs. Secondly, it contains a number of typical textual elements with a short description of their typical content.

The preface is a section about the report itself as seen from the outside. The preface is an independent chapter in the report and, in a sense, not part of the report itself, but more of an apron for the report. For short reports, the preface is often omitted. It often contains:

- Who has written the report, when and in what connection?
- How has the report been made? Is it an exam project, there is a task manager and if so, who?
- It would also be natural to include a project contract if it exists and it is not long. Acknowledgments to supervisors, professional helpers, and others who have contributed to the report can be put in the preface.

2 Introduction

The introduction gives an introduction to the report's topic on an overall level. The introduction contains a brief and general introduction to the academic elements covered by the report, motivation for the performance of the work, a brief summary of existing work with precise references to the literature, and possibly "teasers"for the results achieved in the work. Remember that a figure can be very illustrative when you want to give the reader an overall understanding, see for example Figure 1. The introduction should typically be written so that it can be read and understood together with the conclusion with only a superficial knowledge of the rest of the report's content.

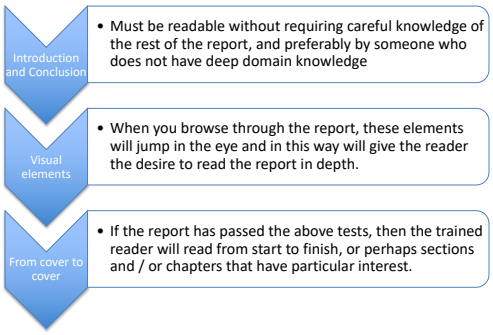
3 Problem statement

The problem statement typically contains a precise description of the problem or hypothesis that the report deals with. This will also be a natural place to describe which limitations to the problem domain and solution space has been imposed as part of working with the problem. This section is often merged with the introduction.

4 Problem analysis and design

This section describes the analysis that has been done to solve the problem. It is important that the main options which have been considered are described and that objective reasons be given for the choices made. A typical form is:

1. Describe the problem
2. List the possible solutions together with their advantages and disadvantages
3. Describe the solution chosen and why, and possibly add further analysis of the solution.



Figur 1: A figure provides an opportunity to communicate with visual instruments that can support reading. The figure shows a summary of how a tanned reader often reads reports.

```
(* Fibonacci Number formula *)
let rec fib n =
    match n with
    | 0 | 1 -> n
    | _ -> fib (n - 1) + fib (n - 2)
```

Figur 2: An example of a program listing. Sometimes this is included in a float, other times inline in the text.

Figures of for example the program design are usually found in this section. This section often contains a general description of the key data structures as well as a sketch of the most important (parts of) functions and their types. Typically, this section is less focussed on the actual implementation and more on the overall concepts. For this reason, descriptions using simplified program stumps or pseudocode is often found here.

5 Program description

The program description is a review of the program produced. It will contain an overview of the structure of the program referring to the actual program. It will contain a repeated description of the solutions chosen and a review of the key issues of transforming central choices for the problem analysis into the specific program. In contrast to the Problem analysis and design section, this section will focus on the programming choices in the chosen programming language. It should not be a complete restatement of the program, but a description somewhere between the Program analysis and design description and the source code. It will often be natural to focus only on non-obvious solutions and special insights and tricks that are used in the code. For example, one could include program code bits such as shown in Figur 2 This section can also contain a brief description of how the program is used. E.g., if the program is to be run from the command line, what arguments can be used and what is their effect. An actual user manual is most often seen as an appendix.

6 Testing and experiements

The purpose of testing is to document the correctness of the program developed. Testing can be performed at several levels such as White-box, where every line of code is executed and evaluated in some manner; Black-box testing, where the code is tested in relation to the input domain's characteristic and without using explicit knowledge of how the units have been implemented; and finally more general experiments,

where the code is used in an intended use-case scenario to solve realistic problems. In any case, this section will include a description of the testing goal and design, and a description of the tests implemented. In the case of a more experimental work where a thorough review of the input domain is not possible, the section will also include a description of and the result of a set of experiments that make it probable to what extent the program solves the problem statement. To document running times, it will be natural to make realistic experiments where the program is run on a variety of data types and sizes as relevant.

It is important to remember to describe which principles the testing and experiments have been designed, and to argue to what extent they cover the relevant problem area and to what extent they show that the program solves the problem formulation. This section will often draw partial conclusions, which are summarized in the conclusion section.

7 Discussion and/or Conclusion

Discussion and the conclusion section summarize the problem, the solution, and the results achieved. This section should describe in short and precise form, if any, the extent to which the problem statement has been solved. This section should also include reflections on choices, summarizing what you have learned in the process, and may include suggestions for further work.

Remember that this section is usually read first, just after the introduction, and must, therefore, be able to function fairly well without detailed knowledge of the intermediate sections.

8 Postscript and appendices

Postscripts in scientific works are not common. Appendices are. Here we will give a short list of general advice for report writing:

- It is your job to ensure that your ideas and thoughts are communicated to the reader. That it is most likely the first time the reader sees your text and characters, and therefore you cannot assume that the reader can guess what you might find obvious.
- Typical reading order for the trained reader is as follows: 1) Read the introduction and conclusion; 2) Browse the report and look at figures and other central visual elements such as tables, code pieces, and equations; 3) Read the report from cover to cover. In general, you may lose the reader's attention in any stage so it is important to produce a work, that at all stages entice the reader to continue reading.
- The introduction and conclusion are often the sections written last, since the section in between often develop until the very end. Thus, it is a good idea to develop these sections loosely, by writing comments and notes, but also not to spend too much time polishing them before the very end.
- Remember that all graphical elements used in a figure must be described in the figure's caption. Remember to add labels to axes, describe units, etc. It is recommendable to begin a figure caption with a short statement of what the figure shows, e.g., „Our method outperforms state-of-the-art:. . . " However, also don't make the caption too long. The main discussion on the figure should be in the accompanying text. Never add a figure without a reference in the text. Finally, remember that it will be the first time a reader sees your figure, and the reader will need help to see, what you see in the figure.
- Most writers experience blindness w.r.t. their product: When we read what we have written, we often read what we intended to write instead of what we actually wrote. We will also tend to overlook even forgive simple mistakes. The target reader will read the text differently. Thus, use a spell and grammar checker! Another simple trick is to ask a friend or colleague to read central text pieces aloud for you. For this to work, you must remain silent and observe and note where the reader stumbles or briefly and only briefly clear out simple misunderstandings, for the reader to be able to continue reading. Your friend or colleague need not be in any way an expert in the field of the report, and you will most likely find that this method is very effective in highlighting where the text is incoherent and the arguments thin or confusing. It is recommended as a minimum to work with the Introduction and Conclusion in this manner.