

Exploration and Presentation L^AT_EX

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1 Introduction

The first assignment is to find the requirements of a bachelor thesis. The requirements has to be written in \LaTeX and the sources has to be documented. The second assignment is to produce a template in \LaTeX , that we can use in our bachelor thesis.

2 Assignment 1

1. Title page without page number
2. Writing a comment
3. Table of contents
4. Danish characters, æ ø å
5. Graphics
 - Image caption
 - Caption over Image
 - Caption under Image
 - Label
 - Centering
 - Two images next to each other
6. Reference to image
7. Reference to page containing the image
8. Section, subsection, paragraph, subparagraph
 - Numbered Section
 - Non-numbered Section
9. Lists
 - Bullet points
 - Alternative bullet points
 - Enumerated lists
 - Alternatively numbered lists (roman numerals, letters)
10. Table with multiple columns
 - Various horizontal alignments in columns (left, right, centered)
 - Cell spanning multiple columns
 - Vertical alignment in multi-line cells
 - Table description and label
 - Reference to table
11. Code listing
 - With emphasized key words in your favorite programming language
12. Math equations

- Inline equations (in text)
 - Display equations (on separate line)
 - Fractions, summations, products, roots, powers
13. Bibliography with book, article and internet link
 14. To-do notes of own choice

2.1 Text

2.1.1 Title page without page number

```
\clearpage\maketitle  
\thispagestyle{empty}
```

2.1.2 Writing a comment

```
\documentclass{article}  
  \usepackage{xcolor}  
  \usepackage{lipsum} % dummy text for the MWE  
  
% Put % before of what you want disabled  
  
% Select what to do with todonotes:  
% \usepackage[disable]{todonotes} % notes not showed  
\usepackage[draft]{todonotes} % notes showed  
  
% Select what to do with command \comment:  
% \newcommand{\comment}[1]{} %comment not showed  
\newcommand{\comment}[1]  
{\par {\bfseries \color{blue} #1 \par}} %comment showed  
  
\begin{document}  
  \lipsum[1]  
  \todo{This is a to do note at margin}  
  \lipsum[2]  
  \comment{This is a simple comment between text}  
  \lipsum[3]  
  \todo[inline]{This is a todo note inline}  
  \comment{This is the end, check the to-do list}  
  \listoftodos  
\end{document}
```

Figure 1: L^AT_EX comments

2.1.3 Table of contents

```
\tableofcontents
```

2.1.4 Danish characters

```
\AA, \aa  
\AE, \ae  
\O, \o
```

```
\A, \a  
\E, \e  
\O, \o
```

2.2 Graphics

2.2.1 Caption over image

```
\includegraphics[scale=0.4]{latex_comments.png}  
\caption{\LaTeX comments}  
\label{fig:f1}
```

2.2.2 Caption under image

```
\caption{\LaTeX comments}  
\includegraphics[scale=0.4]{latex_comments.png}
```

2.2.3 Label

```
\label{fig:comments}
```

2.2.4 Centering

```
\centering
```

2.2.5 Two images next to each other

```
% without using a package  
\documentclass{article}  
  
\usepackage{graphicx}  
  
\begin{document}  
  
\begin{figure}[!tbp]  
  \centering  
  \begin{minipage}[b]{0.4\textwidth}  
    \includegraphics[width=\textwidth]{flower1.jpg}  
    \caption{Flower one.}  
  \end{minipage}  
  \hfill  
  \begin{minipage}[b]{0.4\textwidth}  
    \includegraphics[width=\textwidth]{flower2.jpg}  
    \caption{Flower two.}  
  \end{minipage}  
\end{figure}  
  
\end{document}
```

(a) Version 1

```
% using the subfig package  
\documentclass{article}  
  
\usepackage{graphicx}  
\usepackage{subfig}  
  
\begin{document}  
  
\begin{figure}[!tbp]  
  \centering  
  \subfloat[Flower one.]{\includegraphics[width=0.4\textwidth]{flower1.jpg}\label{fig:f1}}  
  \hfill  
  \subfloat[Flower two.]{\includegraphics[width=0.4\textwidth]{flower2.jpg}\label{fig:f2}}  
  \caption{My flowers.}  
\end{figure}  
  
\end{document}
```

(b) Version 2

Figure 2: Images

[2]

2.2.6 Reference to image

```
\citep{here comes the name of the reference in the bib file}  
Reference is shown at the last page.
```

2.2.7 Reference to page containing the image

see figure \ref{fig:f2} on page \pageref{fig:f2}

2.3 Lists and Sections

2.3.1 Numbered Section

```
\section{First Section}  
\section{Second Section}
```

2.3.2 Non-Numbered Section

```
\section*{First Section}  
\section*{Second Section}
```

2.3.3 Bullet points

```
\begin{itemize}  
  \item Milk  
  \item Sugar  
\end{itemize}
```

2.3.4 Alternative bullet symbols

```
\renewcommand{\labelitemi}{$\blacksquare$}  
\renewcommand{\labelitemii}{$\square$}  
\begin{itemize}  
  \item Milk  
  \item Sugar  
\end{itemize}
```

2.3.5 Enumerated lists

```
\begin{enumerate}  
  \item Milk  
  \item Sugar  
\end{enumerate}
```

2.3.6 Roman numerals, letters

Roman numbers in enumerate list

```
\begin{enumerate}[label=(\Roman*)]  
  \item Milk  
  \item Sugar  
\end{enumerate}
```

Letters in enumerate list

```
\begin{enumerate}[label=(\roman*)]  
  \item Milk  
  \item Sugar  
\end{enumerate}
```

2.4 Table with multiple columns

2.4.1 Various horizontal alignments in columns (left, right, centered)

Left	Center	Right
Left and Left	Center and Center	Right and Right
Left	Center	Right

Table 1: Caption

2.4.2 Cell spanning multiple columns

7C0	hexadecimal
3700	octal
11111000000	binary
1984	decimal

Table 2: Caption

2.4.3 Vertical alignment in multi-line cells

Team sheet	
GK	Paul Robinson
LB	Lucas Radebe
DC	Michael Duberry
DC	Dominic Matteo
RB	Dider Domi
MC	David Batty
MC	Eirik Bakke
MC	Jody Morris
FW	Jamie McMaster
ST	Alan Smith
ST	Mark Viduka

Table 3: Caption

2.4.4 Table description and label

```
\caption{Description}  
\label{tab:my_label_3}
```

2.4.5 Reference to table

Table 1 summarizes Text

Table 2 summarizes Text

Table 3 summarizes Text

```
Table~\ref{tab:my_label_1} summarizes Text \\  
Table~\ref{tab:my_label_2} summarizes Text \\  
Table~\ref{tab:my_label_3} summarizes Text \\  

```

2.5 Code listing

2.5.1 With emphasized key words in your favorite programming language

```
// Hello.java  
import javax.swing.JApplet;  
import java.awt.Graphics;  
  
public class Hello extends JApplet {  
    public void paintComponent(Graphics g) {  
        g.drawString("Hello, world!", 65, 95);  
    }  
}
```

2.6 Math equations

2.6.1 Inline equations (in text)

The well known Pythagorean theorem $x^2 + y^2 = z^2$ was proved to be invalid for other exponents.

2.6.2 Display equations (on separate line)

This is a simple math expression

$$\sqrt{x^2 + 1}$$

separated from text.

2.6.3 Numbered equation

$$E = m \tag{1}$$

2.6.4 Fractions, summations, products, roots, powers

1. $\frac{1}{2}$
2. $x + y = z$
3. $x * y = z$
4. $\sqrt{x^2 + 1}$
5. x^2
6. x^3

2.7 Bibliography with book, article and internet link

2.7.1 Hyperlinks

Something Linky

```
\href{http://www.sharelatex.com}{Something Linky}
```

2.7.2 Bibliography and article

Bibliographic references are usually kept in a bibliography file whose extension is .bib, this file consists of a list of records and fields. Each bibliography record holds relevant information for a single entry.

```
@article{einstein,
  author =      "Albert Einstein",
  title =       "{Zur Elektrodynamik bewegter K{\\"o}rper}. ({German})
    [{On} the electrodynamics of moving bodies]",
  journal =     "Annalen der Physik",
  volume =      "322",
  number =      "10",
  pages =       "891--921",
  year =        "1905",
  DOI =         "http://dx.doi.org/10.1002/andp.19053221004"
}
```

2.8 To-do notes of own choice

see the bottom of the page for the TO-DO note list

The original to-do note without changed colours.
Here's another line.

Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo

nec dolor. Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor. Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor. Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor. Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor.

Is this correct?

I'm unsure about also!

Change this!

This can help me in chapter seven!

This really needs to be improved!

What was I thinking?!

The following section needs to be rewritten!

Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor.

3 Assignment 2

3.1 Bachelor project

This document describes the requirements and expectations of your bachelor project.

3.2 Curriculum

The curriculum lists the official requirements and learning goals for the bachelor project, as given by Cphbusiness.

The requirements, video guide and the examination regulation can be found here:

[Bachelor requirements](#)

[Examination Regulations](#)

[Structure of bachelor project](#)

[Evaluation Criteria for the Bachelor Project](#)

3.3 The project

The bachelor project is a project where the student investigates a software-related problem, propose a solution, and does some implementation to demonstrate the solution. The student should strive to include elements from the courses passed during the program (Large Systems Development, Databases Testing, System Integration). The project may be done in groups of up to 4 people. Having a larger group should increase the project scope, as it raises the general expectations of the project. The project covers 15 EC-TS points, which is roughly equivalent to

$$15 \cdot 27.4 \text{ hours} = 412.5 \text{ hours}$$

3.4 Report

Size of Report: The maximum page count for the bachelor report is given by the formula below.

$$\text{maxPageCount} = 40 + 20 \cdot \text{numberOfStudents}$$

Reports shorter than $\frac{2}{3}$ will usually be experienced as short, although there is no official minimum size.

Language: The report can be written in either Danish or English.

Contents: The report should contain a thorough description of the work that has been done during the bachelor project, as well as an evaluation and reflection on the work.

3.5 Report components

The instructors recommend the following sections to be in the report. The components of the report do not have to be presented in exactly the same order but are recommended to be present.

3.5.1 Project title

Cover page: Project title, your name and student identification, school and supervisor.

3.5.2 Abstract

Four sentences: Problem statement, further elaborated in Introduction. It can be seen as an advertisement for the rest of the report. The final abstract is written in the end of the project.

- What is the problem ?
- Why is the problem interesting ?
- What is the solution
- What are the implementation ?

3.6 Introduction

Project summary:

- Motivation - Why this topic is important nowadays.
- Project objectives — what is the expected result.
- Project tasks — what is to be done for achievement of the objectives-steps in the work, such as getting acquainted with the state-of-the-art and trends in the area, selecting a development methodology, creating a design, selecting development tools and environments, programming, testing, implementation and evaluation, as appropriate.
- Scope of the project — what is not an objective or a task.
- Brief description of the other chapters that follow — one paragraph per each.

3.6.1 State of the art and trends

Survey of current technologies and similar solutions in this area – to show that you are well informed and step on the available achievements: For example, you can present some relevant knowledge gathered from both previously studied modules and external sources, organized in a structured form. Here you can also describe and compare alternative development methodologies, technologies, environments, frameworks, or programming languages that could have been used, and to explain and argue your choice. Inside the text, a citation or a reference to the used sources (books, articles, web pages) is required. The sources can be listed either underscore, or in an Appendix.

3.6.2 Requirements specification and solution design

Formulation of project foundation – a solid ground of your solution: This part reflects the design process, or the methodology you have followed. Analysis – who are the users, use-cases and scenarios, intended user experiences. The analysis lead to specifications – formal functional and non-functional requirement to the application. Specifications lead to requirements: you consider how to design the solution– system architecture, data models, visual interface, control, operability, algorithms, integration and other components, as appropriate. Use graphics for visual presentation of your concepts as much as possible.

3.6.3 Solution development and implementation

Presentation of the application, test procedures, deployment and maintenance environments: This part presents the product in technical terms. Implementation and test environment— test strategies, test plan, test suites, demo and screen captures, usability evaluation, etc. Units of code, packages, deployment, supported interfaces, algorithms, input and output, supported file formats, frameworks, servers and clients, etc.

3.6.4 Conclusions

Brief summary: What has been done and the benefits of it. Recommendation for future extensions and upgrades. Reflection on the work and the product.

3.6.5 Appendices

Reference of information sources as many, as possible, listed according a standard - see:

[Reference standard](#)

Installation guide and/or user manual, if appropriate. Source code of main components, if appropriate.

3.6.6 Final works

Project and documentation completed. Visual (power point) presentation and a demo prepared. It is recommended to discuss the draft-report with the supervisor before the final!








4 Conclusion

“I always thought something was fundamentally wrong with the universe” [\[1\]](#)

References

- [1] D. Adams. *The Hitchhiker's Guide to the Galaxy*. San Val, 1995.
- [2] Unknown. Putting two images beside each other, 2014.

Notes

	The original to-do note without changed colours.	
	Here's another line.	12
	Is this correct?	13
	I'm unsure about also!	13
	Change this!	13
	This can help me in chapter seven!	13
	This really needs to be improved!	
	What was I thinking?!	13
	The following section needs to be rewritten!	13