DOCUMENT STRUCTURE

LaTeX: A Professional Document Preparation System

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March 25, 2023

AGENDA

INTRODUCTION

Documents usually have some form of "logical structure": division into

- chapters,
- sections,
- sub-sections,
- etc.,

to organize their content.

LaTeX supports the creation of a document structure and also enables customization of sectioning and numbering. The commands available to organize a document depend on the document class being used, although the simplest form of organization, sectioning, is available in all formats.

SECTIONING

```latex
\documentclass{article}
\usepackage{blindtext}

\title{Sectioning}
\author{John Doe}
\date{\today}

\begin{document}
\maketitle
\section{Introduction}
This is the first section. \blindtext

\section{Second Section}
This is the second section. \blindtext
\end{document}
```

OUTPUT

Sectioning

John Doe

December 25, 2022

1 Introduction

This is the first section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

2 Second Section

This is the second section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis

LEVEL OF SECTIONING

LaTeX can organize, number, and index chapters and sections of document. There are 7 levels of depth for defining sections depending on the document class:

Level	Command
-1	**\part** {PartName}
0	**\chapter** {ChapterName}
1	**\section** {SectionName}
2	**\subsection** {SubSectionName}
3	**\subsubsection** {SubSubSectionName}
4	**\paragraph** {ParagraphName}
5	**\subparagraph** {SubParagraphName}

NUMBERED SECTIONS

```latex
1  \documentclass{article}
2  \usepackage{blindtext}
3
4  \title{Sectioning}
5  \author{John Doe}
6  \date{\today}
7
8  \begin{document}
9  \maketitle
10 \section{Introduction}
11 This is the first section. \blindtext
12 \subsection{A Minor Topic}
13 This is a subsection. \blindtext
14
15 \subsection{Another Minor Topic}
16 This is also a subsection. \blindtext
17
18 \section{Second Section}
19 This is the second section. \blindtext
20
21 \end{document}
```

OUTPUT

<center>

Sectioning

John Doe

December 25, 2022

</center>

1 Introduction

This is the first section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

1.1 A Minor Topic

This is a subsection. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

1.2 Another Minor Topic

This is also a subsection. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo,

TABLE OF CONTENTS

```latex
1   \documentclass{article}
2   \usepackage{blindtext}
3
4   \title{Sectioning}
5   \author{John Doe}
6   \date{\today}
7
8   \begin{document}
9   \maketitle
10  \tableofcontents
11  \section{Introduction}
12  This is the first section. \blindtext
13  \subsection{A Minor Topic}
14  This is a subsection. \blindtext
15  \subsection{Another Minor Topic}
16  This is also a subsection. \blindtext
17  \section{Second Section}
18  This is the second section. \blindtext
19  \subsection{Second Minor Topic}
20  This is a subsection. \blindtext
21  \subsection{Futher Minor Topic}
22  This is also a subsection. \blindtext
23  \end{document}
```

OUTPUT

Sectioning

John Doe

December 25, 2022

Contents

1 Introduction

This is the first section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent

UNNUMBERED SECTIONS

```
1   \tableofcontents
2   \section*{Introduction}
3   This is the first section. \blindtext
4
5   \subsection{A Minor Topic}
6   This is a subsection. \blindtext
7
8   \subsection{Another Minor Topic}
9   This is also a subsection. \blindtext
10
11  \section{Second Section}
12  This is the second section. \blindtext
13
14  \subsection*{Second Minor Topic}
15  This is a subsection. \blindtext
16
17  \subsection{Futher Minor Topic}
18  This is also a subsection. \blindtext
```

OUTPUT

Sectioning

John Doe

December 25, 2022

Contents

Introduction

This is the first section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

0.1   A Minor Topic

THE `article` CLASS

```latex
1  \documentclass{article}
2  \usepackage{blindtext}
3  \title{Sections in an Article}
4  \author{John Doe}
5  \date{\today}
6  \begin{document}
7  \maketitle
8  \tableofcontents
9
10 \section{What is it and what makes it so different?}
11 Here is a first section. \blindtext
12
13 \subsection{Explaining: Where to start?}
14 This is a subsection. \blindtext
15
16 \section{Background}
17 This is a section. \blindtext
18
19 \subsection{Opening up the black box}
20 This is a subsection. \blindtext
21 \end{document}
```

Output: Article

OUTPUT: ARTICLE

Contents

1 What is

Here is a first sec ...
elit. Etiam lobortis ...
Praesent imperdiet ...
lectus velit ultrices ...
nunc, molestie ut, ...
sapien. Lorem ipsu ...
tristique neque. ...
rutrum augue a leo. ...
blandit blandit ma ...
a, turpis. Mauris ...
accumsan semper.

1.1 Explaini

This is a subsectio ...
Etiam lobortis faci ...
sent imperdiet mi ...
lectus velit ultrices ...
nunc, molestie ut, ...
sapien. Lorem ipsu ...
tristique neque. ...
rutrum augue a leo ...
blandit blandit ma ...
a, turpis. Mauris ...
accumsan semper.

2 Background

This is a section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

2.1 Opening up the black box

This is a subsection. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

2

THE report CLASS

```
1   \documentclass{report}
2   \usepackage{blindtext}
3   \title{Sections and Chapters}
4   \author{John Doe}
5   \date{\today}
6   \begin{document}
7   \maketitle
8   \tableofcontents
9
10  \chapter{An Introduction }
11  \section{What is it and what makes it so different?}
12  Here is a first section. \blindtext
13
14  \subsection{Explaining: Where to start?}
15  This is a subsection. \blindtext
16
17  \chapter{Background and history}
18  \section{Background}
19  This is a section. \blindtext
20
21  \subsection{Opening up the black box}
22  This is a subsection. \blindtext
23  \end{document}
```

OUTPUT: REPORT

Sections and Chapters

John Doe

December 25, 2022

OUTPUT: REPORT

Contents

1

OUTPUT: REPORT

Contents

Chapter 1

An Introduction

1.1 What is it and what makes it so different?

Here is a first section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

1.1.1 Explaining: Where to start?

This is a subsection. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

2

OUTPUT: REPORT

Contents

Chapter 1

An Int...

1.1 What is...

Here is a first sec...
elit. Etiam lobortis...
Praesent imperdiet...
lectus velit ultrices...
sapien, molestie ut...
sapien. Lorem ips...
tristique neque. S...
rutrum augue a le...
blandit blandit ma...
a, turpis. Mauris...
accumsan semper.

1.1.1 Explan...

This is a subsectio...
Etiam lobortis faci...
sent imperdiet ni...
lectus velit ultrices...
nunc, molestie ut...
tristique neque. S...
rutrum augue a le...
blandit blandit ma...
a, turpis. Mauris...
accumsan semper.

Chapter 2

Background and history

2.1 Background

This is a section. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

2.1.1 Opening up the black box

This is a subsection. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

THE book CLASS

```latex
1   \documentclass{book}
2   \usepackage{blindtext}
3   \title{Sections and Chapters}
4   \author{John Doe}
5   \date{\today}
6   \begin{document}
7   \maketitle
8   \tableofcontents
9
10  \chapter{An Introduction }
11  \section{What is it and what makes it so different?}
12  Here is a first section. \blindtext
13
14  \subsection{Explaining: Where to start?}
15  This is a subsection. \blindtext
16
17  \chapter{Background and history}
18  \section{Background}
19  This is a section. \blindtext
20
21  \subsection{Opening up the black box}
22  This is a subsection. \blindtext
23  \end{document}
```
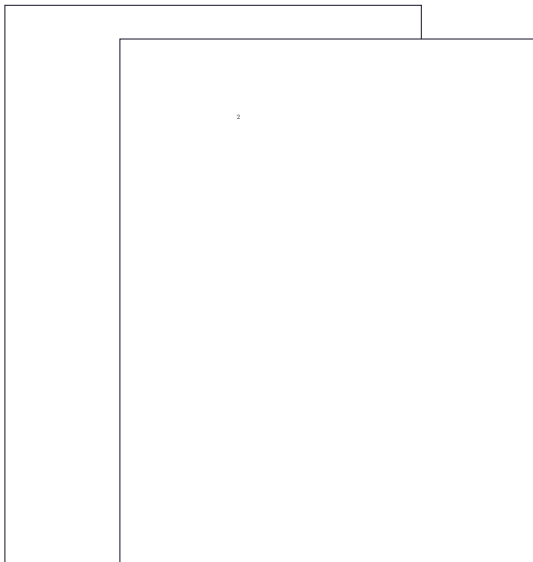
OUTPUT: BOOK

Sections and Chapters
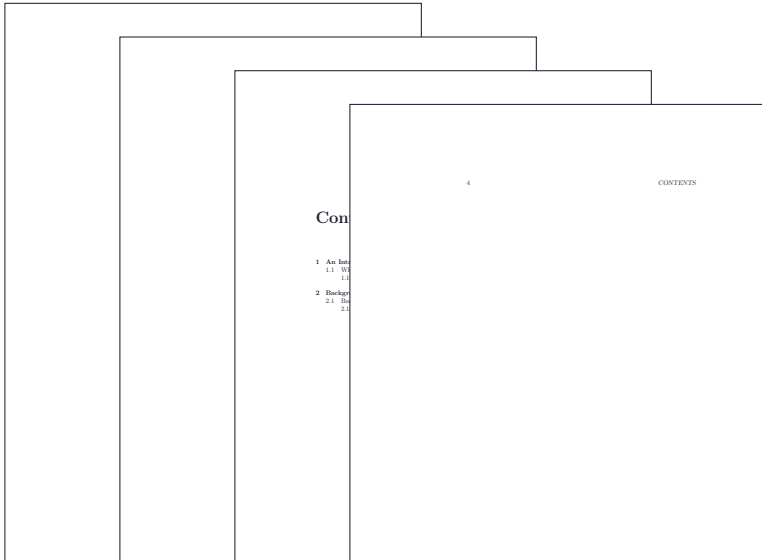
John Doe

December 25, 2022

OUTPUT: BOOK

OUTPUT: BOOK

Contents

3

OUTPUT: BOOK

OUTPUT: BOOK

Contents

Chapter 1

An Introduction

1.1 What is it and what makes it so different?

Here is a first section. Lorem ipsum dolor sit amet, consectetur adipiscing
elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin.
Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo,
lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc
nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in
sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla
tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam
rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent
blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas
a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis
accumsan semper.

1.1.1 Explaining: Where to start?

This is a subsection. Lorem ipsum dolor sit amet, consectetur adipiscing elit.
Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Prae-
sent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo,
lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc
nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in
sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla
tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam
rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent
blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas
a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis

Document Classes: `article` vs. `report` vs. `book`

Differences with regard to **default settings**:

- The book class uses the twoside class option, while report and article use oneside.
- book uses openright, while `report` uses openany. (Note that "right" means an odd page in twoside mode, but any page in oneside mode.) For `article`, the distinction between openright and openany isn't applicable.
- book uses the headings pagestyle for non-chapter-starting pages, while `report` and `article` always use plain.
- book and `report` use titlepage, while `article` uses notitlepage.

Document Classes: `article` vs. `report` vs. `book`

Differences with regard to **default settings**:

- For book and `report`, the lowest-level sectioning command which is numbered and incorporated into the table of contents is `\subsection`, while for `article` it is `\subsubsection`.

- book and `report` will use the arguments of `\chapter` and `\section` for running headings, while `article` will use `\section` and `\subsections`.

- book and `report` will number floats (figures, tables etc.), equations, and footnotes per chapter, while `article` will number them continuously.

- book and `report` use `\bibname` for the heading of bibliographic references, while `article` use `\refname`.

Document Classes: `article` vs. `report` vs. `book`

Differences with regard to **available commands and environments**:

- book and report feature the **\chapter** sectioning command, while article doesn't.
- In book and report, **\appendix** will cause **\chapters** to be typeset as "Appendix X" instead of "Chapter X". For article, this isn't applicable.
- book and report will start a new page for **\parts**, while article won't.
- book offers the **\frontmatter**, **\mainmatter**, and **\backmatter** commands to control page numbering, while report and article don't.
- book doesn't offer the abstract environment, while report and article do.

Ratthaprom PROMKAM

RMUTT, March 25, 2023   ratthaprom_p@rmutt.ac.th