LaTeX Workshop: Document Structure

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Introduction to Document Structure

LaTeX allows you to create complex documents with chapters, sections, and custom layouts. Here's how to make the most out of LaTeX's structure options.

0.1 Basic Article Structure

The most basic LaTeX document looks like this:

```
\documentclass{article}
\begin{document}
    \section{Introduction}
    Your content goes here...
\end{document}
```

0.2 Multi-chapter Reports

For larger documents like reports or thesis, use the `report` class and add chapters.
Code:

```
\documentclass{report}
\begin{document}
    \chapter{Introduction}
    \section{Background}
\end{document}
```

Output: - **Chapter 1**: Introduction - **Section 1.1**: Background
—

0.3 Customizing Page Layout

You can customize margins, paper size, and layout using the `geometry` package.

```
\usepackage[a4paper, margin=1in]{geometry}
```

—

0.4 Custom Headers and Footers (Using `fancyhdr`)

LaTeX makes it easy to customize headers and footers with the `fancyhdr` package.
Code:

```
\usepackage{fancyhdr}
\pagestyle{fancy}
\fancyhf{}
\fancyhead[L]{LaTeX Workshop}
\fancyfoot[C]{Page \thepage}
```

—

0.5 Table of Contents

To automatically generate a table of contents based on your chapters and sections, use the `\tableofcontents` command:

```
\tableofcontents
```

This will create a list of all chapters, sections, and subsections in your document.
—

0.6 Cross-Referencing Sections and Figures

You can reference sections, figures, and tables using the `label` and `ref` commands. This will automatically update numbers when they change.

Code:

```
\section{Introduction} \label{sec:intro}
In Section \ref{sec:intro}, we introduce the concept of...

\begin{figure}[h]
    \includegraphics{image.png}
    \caption{Sample Figure}
    \label{fig:sample}
\end{figure}

Refer to Figure \ref{fig:sample} for an example.
```

—

0.7 Appendices

You can include appendices for additional material at the end of your document using the `appendix` package.

Code:

```
\begin{appendices}
    \chapter{Additional Figures}
    More details here...

    \chapter{Raw Data}
    Include raw data...
\end{appendices}
```

—

0.8 Customizing the Title Page

You can customize the title page by adding logos, more detailed information, and adjusting formatting.

Code:

```
\title{
    \includegraphics[width=0.3\textwidth]{university-logo.png} \\[1cm]
    \textbf{LaTeX Workshop: Document Structure} \\
    \vspace{0.5cm}
    \large Universiteit Leiden
}
\author{
    \textbf{Dalia Kamalzadeh and Koorosh Komeili Zadeh} \\
    Student Mentors
}
\date{}
```

This will add a university logo at the top of the title page and adjust the author and title styling.

—

0.9 Creating an Index

To create an index, use the `makeidx` package and the `\index` command to mark terms in the text. LaTeX will then automatically generate an index based on those terms.

Code:

```
\usepackage{makeidx}
\makeindex

% In the document, use \index to add terms to the index
Here we introduce \texttt{LaTeX} \index{LaTeX}, a typesetting system.

% At the end of the document, generate the index
\printindex
```

—

0.10 Adding Hyperlinks and PDF Bookmarks

To enable clickable links and navigation in your PDF, use the `hyperref` package. This makes section links clickable in the table of contents and creates a more interactive PDF.

Code:

```
\usepackage{hyperref}
\hypersetup{
    colorlinks=true,
    linkcolor=blue,
    filecolor=magenta,
    urlcolor=cyan,
    pdftitle={LaTeX Workshop},
    bookmarks=true
}
```

This will color the links in your PDF and enable bookmarks in the PDF viewer.

—

Chapter 1

Conclusion

In this guide, we explored:

- The basic structure of a LaTeX document, including articles and reports.
- Custom page layouts, headers, and footers.
- Advanced features such as table of contents, cross-referencing, and appendices.
- Creating a custom title page and index.
- Adding hyperlinks and bookmarks to make your PDFs more interactive.

With these techniques, you can create highly structured, professional LaTeX documents for any purpose.