

Thesis Title

by

First Middle Last

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Science

Department of Example Department
University of Alberta

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Abstract

A thesis must have an abstract. The abstract comes after the title page and is marked page “ii”.

The abstract is a concise and accurate summary of the thesis. It states the problem that was researched, the methods of investigation, and the general conclusions. An abstract must not contain non-text content, such as tables, graphs, complex equations, or illustrations. Even for theses containing journal articles, there is one single abstract for the entire work, included within the preliminary pages (front pages) of the thesis.

For any thesis that is permitted to be written in a language other than English, two abstracts must be included; the first in English and the second in the language of the thesis.

The font used for the abstract must be at least a 10 point font, with the text double-spaced, to ensure readability. A strict maximum word count of 700 words applies, regardless of whether the abstract is for a master’s or a doctoral degree (many abstracts are 300–500 words).

For reference, this section is exactly one-hundred and seventy-six words.

Preface

If you need assistance on writing the preface, ask your supervisor. Your supervisor must review and verify the preface before it becomes part of the final version of the thesis.

A preface is a mandatory component of a thesis, regardless of thesis format, when a thesis contains journal articles authored or co-authored by the student (including an accepted paper that is forthcoming at the time of thesis submission). A preface is also a mandatory component when the research conducted for the thesis required ethics approval. A preface remains optional if there is no inclusion of journal articles and/or no need for ethics approval.

When required because a thesis contains journal articles, the preface serves as a place for the student to include a statement indicating his or her contribution to the journal articles, such as the identification and design of the research program, the performance of the various parts of the research (including the collection of data, construction of any necessary apparatus, and the performance of experiments), and the analysis of the research data. If any of the work presented in the thesis has led to any publications (accepted or published), these publications must be listed clearly in the preface with their bibliographical details and an indication as to where in the thesis this work is located (e.g. state in which chapter or chapters). For jointly authored publications, indication must also be given as to the relative contributions of the collaborators and co-authors, and a statement as to the proportion of research and writing conducted by the student. Note that permission may be needed if the co-authors hold the copyright in these publications. If ethics approval was required

for the research, a statement to this effect must be included in the preface with the details of the approval that was granted.

Note that the inclusion of a preface does not excuse a student from failing to acknowledge the contributions of others in the body of the thesis, as per the University's Research and Scholarship Integrity Policy and the Code of Student Behaviour. One would still expect to see footnotes, endnotes or in-text references within the thesis acknowledging the works. Acknowledgements, such as thanks to the supervisor and supervisory committee members, to colleagues, lab mates and friends, and to family, do not appear in the preface.

Examples of several prefaces are given in Appendix B and are also available from the FGSR website.

“Etiam ac leo a risus tristique nonummy. Donec dignissim tincidunt nulla. Vestibulum rhoncus molestie odio. Sed lobortis, justo et pretium lobortis, mauris turpis condimentum augue, nec ultricies nibh arcu pretium enim. Nunc purus neque, placerat id, imperdiet sed, pellentesque nec, nisl. Vestibulum imperdiet neque non sem accumsan laoreet. In hac habitasse platea dictumst. Etiam condimentum facilisis libero. Suspendisse in elit quis nisl aliquam dapibus. Pellentesque auctor sapien. Sed egestas sapien nec lectus. Pellentesque vel dui vel neque bibendum viverra. Aliquam porttitor nisl nec pede. Proin mattis libero vel turpis. Donec rutrum mauris et libero. Proin euismod porta felis. Nam lobortis, metus quis elementum commodo, nunc lectus elementum mauris, eget vulputate ligula tellus eu neque. Vivamus eu dolor.”

-Author of the Quote

To...

Acknowledgements

An Acknowledgements page (no more than 2 pages in length) is a recommended, but not mandatory, component of a thesis.

The Acknowledgements page serves as a place within a thesis where students may wish to acknowledge the provision of funding from third parties, such as an external scholarship bodies, research granting agencies, and foreign governments. It is also appropriate to recognize the assistance provided by the supervisor and members of the supervisory committee.

e.g. I would like to thank Daniel R. Aldrich for his continuing contributions to the University of Alberta, and for his work within the graduate student community. More specifically, I would like to acknowledge the work that he put into creating the L^AT_EX template that this thesis was created in, and the ongoing support that he provides to the students at the University of Alberta. Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

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Chapter 1

Introduction

1.1 Background

As a graduate student from the University of Alberta, I understand the daunting task that is associated with writing a Thesis that conforms to the guidelines outlined in the FGSR Minimum Thesis Formatting Requirements. It can also be very frustrating to write long, equation and figure heavy, document in a word processor that is prone to crashes, file corruption, seemingly random changes to the formatting, and that do not output a document in the required PDF/A format for submission to FGSR.

Due to these problems, lots of students attempt to use an alternative to traditional word processors: \LaTeX .

\LaTeX allows students/researchers to focus on either the writing of the document or the formatting. Because the writing is separated from the formatting, the writing of the documents can be performed in much more lightweight text editors, or \TeX editors (that also allow for the compilation of the documents). These editors are usually able to save the work after every keystroke and due to the plaintext nature, are not generally susceptible to file corruption. \LaTeX has the added benefit of providing a consistent and professional look and feel throughout the document.

1.2 Objectives

The main objectives of this thesis are:

1. To provide a comprehensive guide on writing a thesis using L^AT_EX.
2. To assist students and researchers in mastering the nuances of L^AT_EX document preparation.
3. To showcase best practices for structuring and formatting a thesis in L^AT_EX.

1.3 Scope and Limitations

While there are existing templates for writing a thesis for the University of Alberta in L^AT_EX, there does not appear to be a template for L^AT_EX that provides students all the information required to write an outstanding thesis. This template/document aims to defeat this shortcoming by providing all the necessary information to create a well structured thesis, as well as providing examples to assist in the formatting of documents written in L^AT_EX. This thesis focuses on the following aspects:

- Installation and basic usage of L^AT_EX.
- Document structure and formatting.
- Inclusion of figures and tables.
- Handling mathematical equations.
- Citations and references using BibT_EX.
- Introduction to advanced topics and recommended packages.

However, it does not cover advanced L^AT_EX programming or extensive customization of document classes. Mainly because I did the heavy lifting for you; the class file, `ualberta.cls`, provides all the major document requirements while this document provides the references of how to include all the bits and bobs that one might want in a thesis.

1.4 Organization of the Thesis

The thesis is organized into several chapters, each addressing a specific aspect of writing a thesis in \LaTeX . The breakdown is as follows:

- **Chapter 2:** Getting Started with \LaTeX
- **Chapter 3:** Document Structure and Formatting
- **Chapter 4:** Figures and Tables
- **Chapter 5:** Mathematical Equations
- **Chapter 6:** Citations and References
- **Chapter 7:** Advanced Topics and Recommended Packages
- **Chapter 8:** Conclusion

Each chapter provides detailed information, examples, and recommendations to help the reader navigate the \LaTeX document preparation process effectively.

1.5 Summary

This chapter introduced the background, objectives, scope, and organization of the thesis. The subsequent chapters delve into specific topics, providing practical guidance and examples for mastering the art of writing a thesis in \LaTeX .

Chapter 2

Getting Started with L^AT_EX

2.1 Installation

To begin using L^AT_EX, you need to install a L^AT_EX distribution on your computer. Here are the steps for installing L^AT_EX on different platforms:

2.1.1 Windows

For Windows users, you can install [MiKTeX](#) or [TeX Live](#). Download the installer from the respective websites and follow the installation instructions.

2.1.2 Mac

On Mac, you can use [MacTeX](#) or [MiKTeX](#). Download the package from the respective websites and follow the installation instructions.

2.1.3 Linux

For Linux users, [TeX Live](#) is a common choice or one can use [MiKTeX](#). Use your package manager to install it, or download the installer from the respective websites.

2.2 Basic Document Structure

Once L^AT_EX is installed, you can create a basic L^AT_EX document. Here is a minimal example:

```

\documentclass{article}
\begin{document}
  \title{My First \LaTeX{} Document}
  \author{Your Name}
  \date{\today}

  \maketitle

  Hello, \LaTeX{}!
\end{document}

```

This example demonstrates a simple \LaTeX document with a title, author, and date. The `\maketitle` command generates the title information.

2.3 Other Software Considerations

While by itself, \LaTeX can be used with just a text editor and compiler, there are some additional software resources that will be very useful.

First of these softwares is a Reference Manager.

Note: *While a reference manager is suited for creating a thesis in \LaTeX , it is not exclusive for use with \LaTeX . In fact, even if you are writing your thesis in word I would recommend the use of one of the suggested reference managers to help keep track of all your references, and to keep track of the information you found within your references.*

Chapter 3

Document Structure and Formatting

A thesis for the University of Alberta can consist of many different parts that come together to create the final document. These will include the Title Page, Abstract, and other prefatory pages; and the chapters, sections, and subsections. In the following sections, we will look into how we can add these different sections and how to manipulate them too.

3.1 Title Page, Abstract, and Other Prefatory Pages

To create a title page in L^AT_EX, you can use the `\maketitle` command after providing the necessary title, author, and date information. This is usually performed in the following way:

```
\title{Your Thesis Title}  
\author{Your Name}  
\date{\today}  
  
\begin{document}  
  \maketitle  
\end{document}
```

For a thesis at the University of Alberta, there are a few more pages that are required (Abstract and Preface) and some that are optional (Quote, Dedication, and Acknowledgements), but all of them have specific formatting requirements. To aid

you in the creation of these pages a few new macros have been provided.

- `\abstracttext`{Abstract Text goes here.}
- `\preface`{Preface Text goes here.}
- `\thesisquote`{Quote Text goes here.}
- `\dedication`{Dedication Text goes here.}
- `\acknowledgementtext`{Acknowledgement Text goes here.}

3.1.1 Title Page

The thesis Title Page has a few more fields to be filled in than a regular \LaTeX document. These include `\degree`, `\specialization`, `\department`, `\faculty`, and `\convocationdate`. An example of how to fill these in can be seen in the original \LaTeX code (`ualberta.tex`) or in [Listing 3.1](#).

Most of the fields are fairly self explanatory, however, to be extra clear as to what needs to be included I will now provide an explanation of each field.:

Table 3.1: Title Page Macro Definitions and Examples

Field	Description	Example
<code>\title</code>	The Title of your Thesis.	The Perfect Thesis Title That is Perfectly Captivating
<code>\author</code>	Your Full Name.	Daniel Ryan Aldrich
<code>\degree</code>	Degree or one of the premade macros (note they are not case sensitive) <i>e.g.</i> , <code>\MSc</code> .	Master of Science or <code>\Msc</code>
<code>\specialization</code>	Specialization, otherwise, leave it blank.	Applied Math
<code>\department</code>	Department, or if you are non-departmentalized, leave this blank.	Mechanical Engineering
<code>\faculty</code>	If you are non-departmentalized, fill this in, otherwise, leave this blank.	
<code>\convocationdate</code>	The year in which you will convocate .	2024

Listing 3.1: Example of How to Set Title Page Info

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%                               TITLE PAGE AND FRONTMATTER INFORMATION                               %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% TITLE PAGE INFO
\title{Thesis Title}           % Title of your Thesis
\author{First Middle Last}     % Your Full Name
\degree{\MSc}                  % \MSc, \PhD, \MA, \MEd, \MBA, \MAc, \MFM, \MN, \
    LLM, or \MMus
\specialization{}              % Leave blank if none
\department{Example Department} % Fill in the Department unless you are non-
    Departmental
\faculty{}                     % Leave blank unless non-Departmental
\convocationdate{2023}         % Convocation Year

```

3.2 Chapters, Sections, and Subsections

Organize your document hierarchically using chapters, sections, subsections, *ect.* These structures all utilize the base macros from L^AT_EX including:

- `\chapter{Chapter Heading}`,
- `\section{Section Heading}`,
- `\subsection{Subsection Heading}`,
- `\subsubsection{Sub-Subsection Heading}`,
- `\paragraph{Paragraph Heading}`,
- `\subparagraph{Subparagraph Heading}`.

💡 For writing your thesis, it is strongly recommended that one outlines the thesis using these commands first, while also added in a small description of what that chapter, section, *ect.*, should accomplish. This will help you stay organized and on track. Remembering that you can use comments, `%`, to hide these descriptions when you start to fill in your content.

3.3 Page Layout and Margins

⚠ WARNING While one can adjust the values using the commands provided by the following packages, unless you really know L^AT_EX inside and out this should be avoided. Everything provided in these files are aimed at making writing your thesis as easy as possible.

You can customize the layout and margins of your document using the `geometry` package. Additionally, you can use the `titlesec` package to customize the formatting of chapter and section titles.

Chapter 4

Figures, Tables, & Plates

4.1 Introduction

Figures and Tables play a crucial role in conveying information effectively in academic documents. This chapter will delve into the intricacies of incorporating figures and tables in your LaTeX document, exploring various features and advanced techniques to enhance the visual appeal and clarity of your content.

4.2 Inserting Figures

In LaTeX, figures are included using the `graphicx` package. The `\includegraphics` command is used to insert an image. Let's consider an example:

Listing 4.1: A Basic Example of Including a Figure.

```
\usepackage{graphicx}

\begin{figure}[htb]
  \centering
  \includegraphics[width=0.8\linewidth]{example-image}
  \caption{Example Figure}
  \label{fig:example}
\end{figure}
```

In this example, the `figure` environment is used to contain the image. The `\centering` command ensures the image is centred horizontally. Adjust the width

parameter to control the size of the image. The `\caption` and `\label` commands provide a caption and label for referencing, respectively.

Figures can be formatted to meet specific requirements. The `\subfigure` command from the subcaption package can be used for side-by-side figures:

```
\usepackage{subcaption}

\begin{figure}[htb]
  \begin{subfigure}{0.48\linewidth}
    \centering
    \includegraphics[width=\linewidth]{example-image-a}
    \caption{Subfigure A}
    \label{subfig:a}
  \end{subfigure}
  \hfill
  \begin{subfigure}{0.48\linewidth}
    \centering
    \includegraphics[width=\linewidth]{example-image-b}
    \caption{Subfigure B}
    \label{subfig:b}
  \end{subfigure}
  \caption{Example with Subfigures}
  \label{fig:subfigures}
\end{figure}
```

This example uses the subfigure environment to create subfigures within a larger figure. The `\hfill` command adds horizontal space between the subfigures.

4.3 Tables and Tabularx

Tables in LaTeX are created using the tabular environment. The tabularx package is particularly useful when you want the table to automatically adjust its width. Let's define some custom column types for convenience:

In this example, the tabularx environment is used, and the custom column types C, L, and R are applied to the columns. This ensures the content is centered, left-justified, and right-justified, respectively.

```

\usepackage{tabularx}
\newcolumntype{C}{>{\centering\arraybackslash}X}
\newcolumntype{L}{>{\raggedright\arraybackslash}X}
\newcolumntype{R}{>{\raggedleft\arraybackslash}X}
Now, let's create a table using tabularx:

\begin{table}[htb]
  \centering
  \begin{tabularx}{\linewidth}{|C|L|R|}
    \hline
    \textbf{Centered} & \textbf{Left Justified} & \textbf{Right Justified} \\
    \hline
    Content & More content & Additional content \\
    \hline
  \end{tabularx}
  \caption{Example Table with Tabularx}
  \label{tab:example}
\end{table}

```

4.4 Advanced Table Features

To create professional-looking tables, the `booktabs` package can be employed. It provides commands for better spacing and styling of tables:

The `\toprule`, `\midrule`, and `\bottomrule` commands create horizontal rules with appropriate spacing.

4.5 Additional Packages for Enhanced Table Functionality

Several other packages can be employed to enhance table functionality:

The `longtable` package allows tables to span multiple pages, which is useful for large datasets. The `multirow` and `multicolumn` packages provide commands for cells that span multiple rows or columns, respectively. The `makecell` package enables more complex table layouts. Each of these packages comes with its set of commands and options. Let's briefly explore the usage of `longtable`, `multirow`, and `multicolumn`:

In these examples, the `longtable` environment is used for tables that span multiple

```

\usepackage{booktabs}

\begin{table}[htb]
  \centering
  \begin{tabular}{ccc}
    \toprule
    \textbf{Header 1} & \textbf{Header 2} & \textbf{Header 3} \\
    \midrule
    Content 1 & Content 2 & Content 3 \\
    Content 4 & Content 5 & Content 6 \\
    \bottomrule
  \end{tabular}
  \caption{Example Table with Booktabs}
  \label{tab:booktabs_example}
\end{table}

```

pages. The `multirow` command is employed to create cells that span multiple rows, while `multicolumn` is used for cells that span multiple columns.

4.6 Conclusion

This chapter provided a comprehensive overview of including figures and tables in your LaTeX document. From basic insertion of figures to advanced table formatting using packages like `tabularx`, `booktabs`, and others, you now have a solid

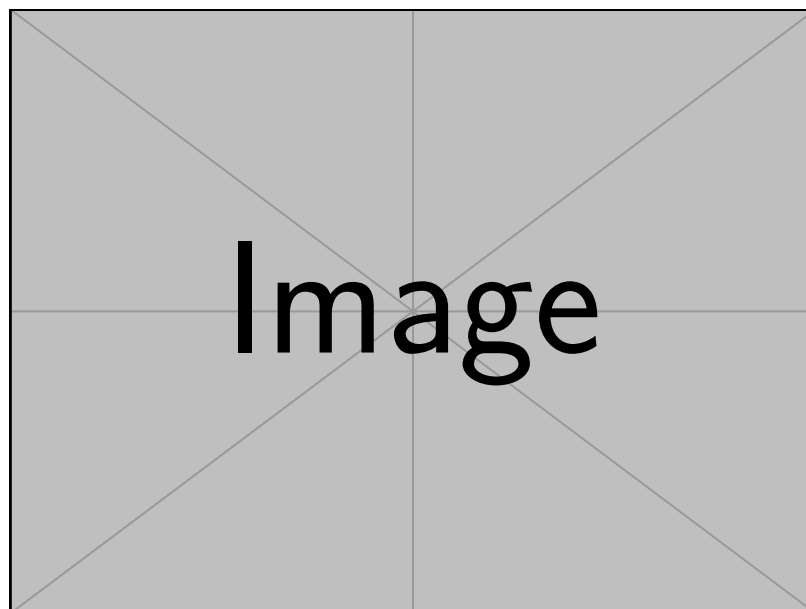


Figure 4.1: This is an example of a single figure.

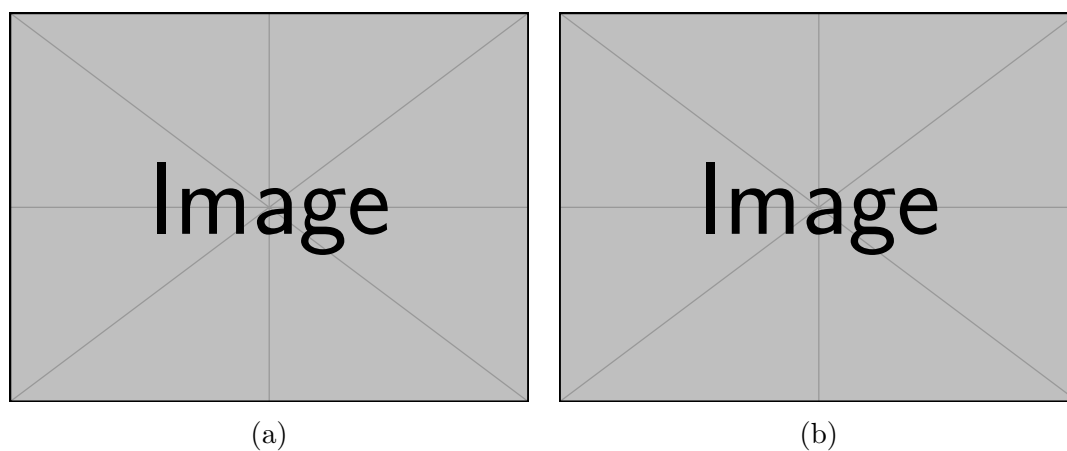
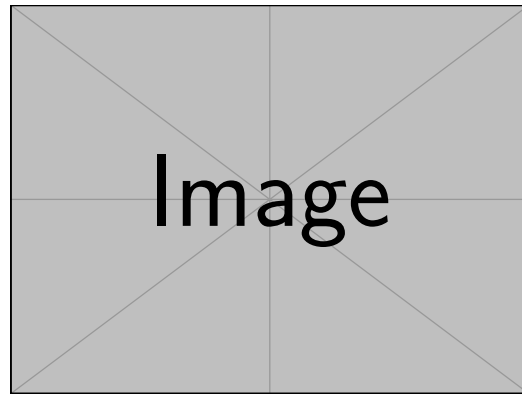
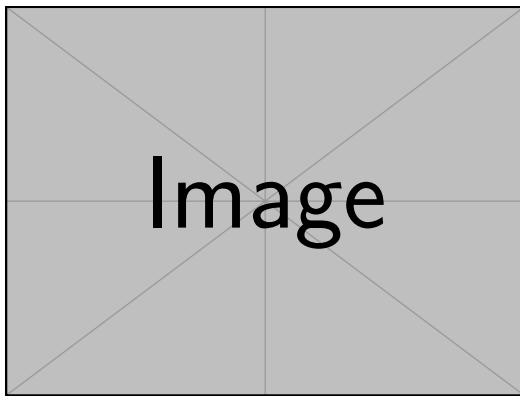


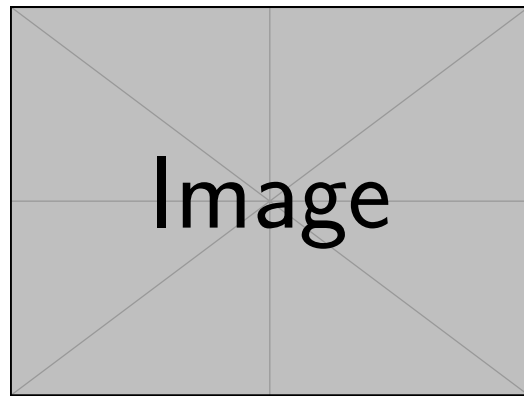
Figure 4.2: This is an example of a double image figure.



(a)

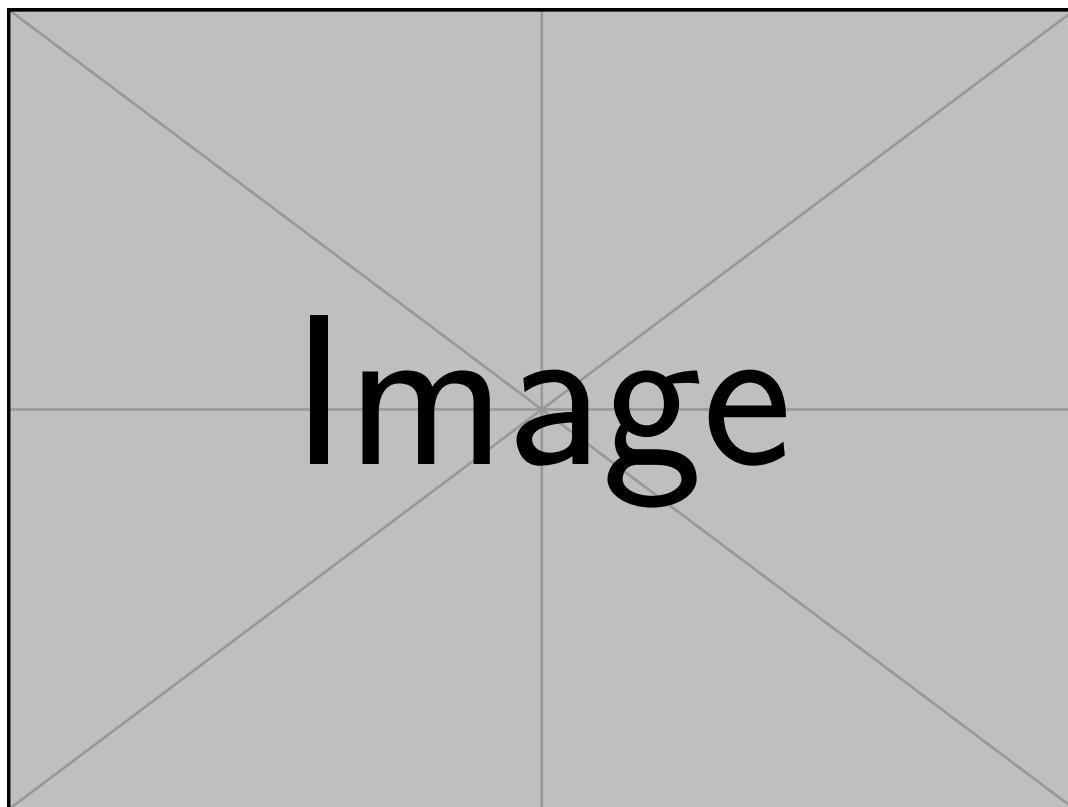


(b)

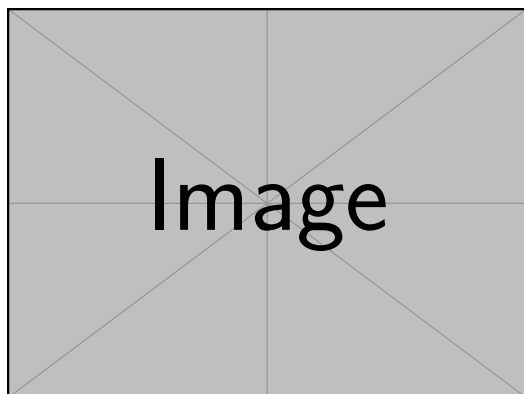


(c)

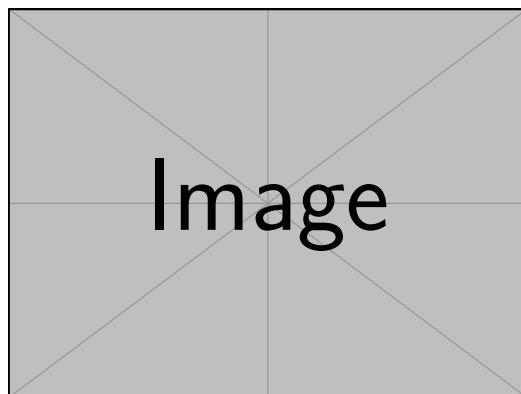
Figure 4.3: This is an example of a triple image figure.



(a)

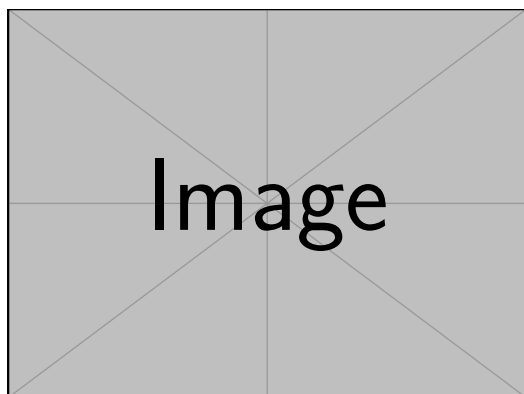


(b)

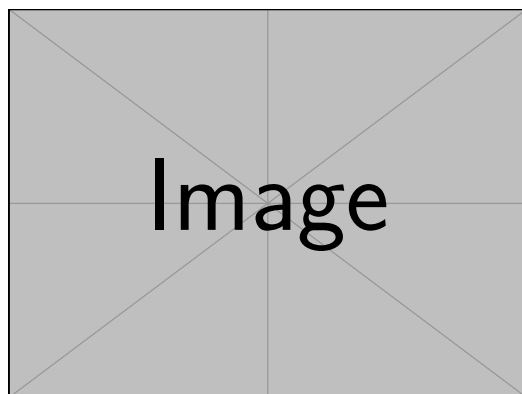


(c)

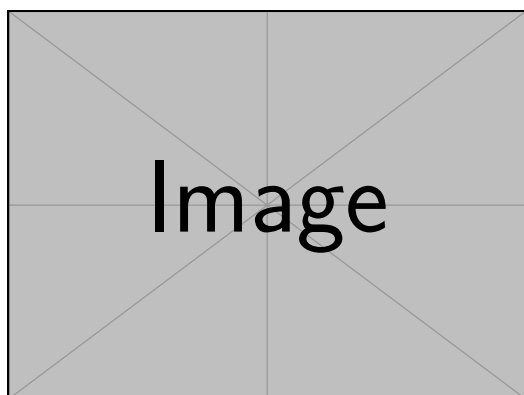
Figure 4.4: This is a second example of a triple image figure.



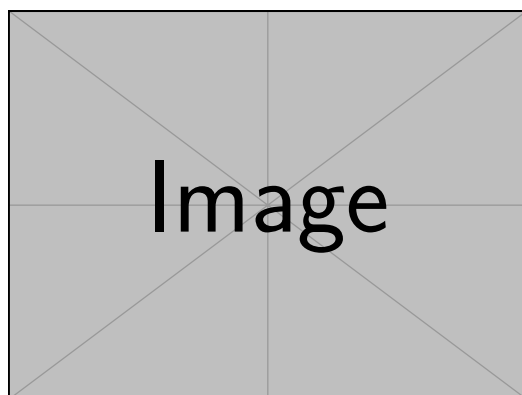
(a)



(b)



(c)



(d)

Figure 4.5: This is an example of a quad image figure.

```

\usepackage{longtable}
\usepackage{multirow}
\usepackage{multicolumn}

% Example Longtable
\begin{longtable}{|c|c|}
  \caption{Longtable Example} \label{tab:longtable} \\
  \hline
  \textbf{Header 1} & \textbf{Header 2} \\
  \hline
  \endfirsthead
  \hline
  \textbf{Header 1} & \textbf{Header 2} \\
  \hline
  \endhead
  Content 1 & Content 2 \\
  Content 3 & Content 4 \\
  \hline
\end{longtable}

% Example Multirow and Multicolumn
\begin{table}[htb]
  \centering
  \begin{tabular}{|c|c|c|}
    \hline
    \multirow{2}{*}{\textbf{Multirow-Col1}} & \multicolumn{2}{c|}{\textbf{Multicolumn-Col2-3}} \\
    \cline{2-3}
    & \textbf{Column 2} & \textbf{Column 3} \\
    \hline
    Content 1 & Content 2 & Content 3 \\
    \hline
  \end{tabular}
  \caption{Example Table with Multirow and Multicolumn}
  \label{tab:multirow_multicolumn}
\end{table}

```


Chapter 5

Example Chapter

This chapter aims to provide examples of how to structure and create specific components in your thesis document. Throughout this section, L^AT_EX’s automatic placement for figures and tables will be disabled in most cases. This is being done to add a specific flow to **THIS DOCUMENT**; this should be avoided in one’s own thesis as it can lead to poor placement of figures, tables, and other “floats”, as well as cause unnecessary white space.

5.1 General Text Layouts

5.1.1 Document Structure

L^AT_EX provides a set of commands that can be used to provide the structure for your document. Depending on the document class, the different commands shown in [Table 5.1](#) may be used. Originally this thesis template was created as a modification to the `book` class, however, it included certain definitions that are unlikely to be included in a thesis document. Due to this, the latest versions of this document (2.0.0+) **do not** include definitions for `part`.

Table 5.1: Document Structure Commands

Level	Command	Notes
-1	<code>\part{}</code>	Not Recommended for Thesis
0	<code>\chapter{}</code>	
1	<code>\section{}</code>	
2	<code>\subsection{}</code>	
3	<code>\subsubsection{}</code>	
4	<code>\paragraph{}</code>	
5	<code>\subparagraph{}</code>	Not Recommended for Thesis

5.1.2 Text Alignment

Generally, the alignment of the text should be left alone and handled by \LaTeX . However, in some rare cases it may be beneficial or even required to change the style of the alignment. While \LaTeX does have built in environments for handling the changing of the alignment, the package `\usepackage{ragged2e}` provides some improvements. Of these improvements, the most obvious is the allowing of hyphenated text to appear in ‘ragged’ or ‘centred’ text.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

5.1.3 Lists

\LaTeX has a few built-in ways for handling lists. The three that we will be looking at here (formatted in an enumerated list) are:

1. `enumerate`
2. `itemize`
3. `description`

These each create lists in a slightly different way. And all of these lists can be nested in each other. For `enumerate`, this creates a numbered list, where each level has a different style of “numbered list”.

1. First Item
 - (a) First Sub Item
 - i. First Sub Sub Item
 - ii. Second Sub Sub Item
 - (b) Second Sub Item
2. Second Item

For `itemize`, this creates a non-numbered list. Every level that is created will have a different style bullet.

- First Item
 - First Sub Item

- * First Sub Sub Item
- * Second Sub Sub Item
- Second Sub Item
- Second Item

For **description**, this creates a descriptive list. Descriptions should have the optional argument included for each `\item` otherwise the line will have a blank in the beginning like the *Second Item* in the next list and not align with the other items.

LVL1 First Item

LVL1-1 First Sub Item

LVL1-1-1 First Sub Sub Item

LVL1-1-2 Second Sub Sub Item

LVL1-2 Second Sub Item

Second Item

Beyond the previous examples, there are no limitation on the types of lists that are nested, allowing for combined styles as shown in the following list.

1. First Item
 - First Sub Item
 - LVL1-1-1** First Sub Sub Item
 - LVL1-1-2** Second Sub Sub Item
 - Second Sub Item
2. Second Item

5.1.4 Footnotes

L^AT_EX can have footnotes added in very easily. Generally these footnotes will be inserted in one of two ways. Using the in-line command:

```
\footnote{footnote text}1
```

Or by using the split footnote. For a split footnote, the macro:

```
\footnotemark[n]2
```

is used to indicate where the mark should be inserted. And the macro:

```
\footnotetext[n]{split footnote text}.
```

is used to signify what the text for the indicated foot note should be. This allow you to help keep your document more organized with the drawback that it is the user’s responsibility to keep track of the foot note numbers or ensure that a `footnotemark` is followed by it’s corresponding `footnotetext`. For this reason, I recommend using the in-line footnotes.

5.2 Cross-References and Citations

This section will be showing off some of the different ways to include “citations” and “cross-references” within your document. Note that **cross-references** in L^AT_EX utilize `\ref{}` as a command, while one might think that this is short for reference this is not the case citation/references utilize the `\cite{}` commands.

5.2.1 Cross-References

In L^AT_EX, references will “reference” a `\label{Reference:Label}` command. This section has the following command to define the the section:

```
\section{Citations and References}\label{sec:citref}
```

¹footnote text

²split footnote text

By using `\ref{sec:citref}`, this allows you to insert a reference that look like this: 5.2. Now this by itself is not the most useful, to make it a bit better we should keep track of what we are referencing, in this case a **Section**, and add this label in front of the reference (`Section~\ref{sec:citref}`) and this will display like this: Section 5.2. Note to ensure the reference is not split we add a non-breaking space (`~`) to prevent L^AT_EX from adding a linebreak.

While using the `ref` command, you might ask “*Why does L^AT_EX not just know what it is that I am referencing and insert that automatically in front of the reference?*” The answer is to provide more flexibility to the user. However, that being said, individuals have created a number of packages that work to enhance the workflow of adding these cross-references. Some of these are provided by the **hyperref** and **cleveref** packages. To include these packages add the following lines to the bottom of your preamble (order matters, `cleveref` needs to be after `hyperref` and `hyperref` should be one of the last packages loaded):

```
\usepackage{hyperref}
\usepackage[nameinlink]{cleveref}
```

With these packages installed we can now use the commands in Table 5.2.³

³Note that because the floats are added where they are in the text this causes them to insert large amounts of white space because it only fits on the following page.

Table 5.2: Built-in, hyperref, and cleveref commands and outputs

Command	Output
built-in	
<code>\ref{}</code>	5.2
<code>\pageref{}</code>	26
hyperref	
<code>\autoref{}</code>	Table 5.2
cleveref	
<code>\cref{}</code>	table 5.2
<code>\Cref{}</code>	Table 5.2
<code>\cref*{}</code>	table 5.2
<code>\Cref*{}</code>	Table 5.2
<code>\cpageref{}</code>	page 26
<code>\Cpageref{}</code>	Page 26
<code>\namecref{}</code>	table
<code>\nameCref{}</code>	Table

Further, the **cleveref** also includes features that allows for the auto sorting and combining of references:

```
\Cref{fig:doubleImage,fig:singleImage,fig:tripleImage
1,fig:quadImage}
```

Noting that there are **NO** spaces between the labels; this will produce: **Figures 5.1 to 5.3 and 5.5**. Allowing one to quickly and efficiently keep references up-to-date and consistent in their style. More examples of the use of the **cleveref** cross-referencing is found through the rest of this Chapter.

5.2.2 Citations

Citations are a lot easier than dealing with the cross-referencing. There are no additional packages required for citations, the built-in ones are feature-rich enough. Now, while there are no additional packages required to make citations in your document, there are in fact a few programs that should help you manage all of your citations/references. These programs can include Mendeley, JabRef, or Zotero; a comparison of the softwares can be found in [Table 5.3](#), and more information of the use of JabRef can be found in [Chapter 6](#). Single citations can be included with the

Table 5.3: Comparison of Reference Softwares

Software	Developer	Version	Cost	License
JabRef	The JabRef Team	5.11	Free	MIT
Mendeley	Elsevier	2.99.0	Free up to 2 GB	Proprietary
Zotero	CDS	6.0.27	Free up to 300 MB	AGPL

`\cite{citationKey}` command, the one at the end of this sentence is created with the `\cite{TEST}` command[1]. Multiple citations can be included in a single cite command by adding commas in between the citation keys. The citation at the end of this sentence shows how to create more than one citation and how they are grouped together, it is created with the `\cite{testone,cite2,cite3,cite4,cite5}` command[2–6]. Finally this sentence shows how a gap in the citations is handled, this is created with the `\cite{testone,cite2,cite3,cite5}` command[2–4, 6].

5.3 Tables

Within this section we will explore some of the typical uses for a table, how to create them, and how to create a consistent look throughout your thesis. \LaTeX provides the default floats environment `table` that can be combined with the `tabular` environment to create tables in your works. While these tables are perfectly functional

they have a very plain look and feel to them. The package `tabularx` can be combined with the `booktabs` package to create elegant and consistent looking tables. A direct comparison of a standard table and the `tabularx` with `booktabs` can be seen in Table 5.4.

Table 5.4: Tabular vs. Tabularx Comparison

(a)			(b)		
Left	Centre		Right	Centre	Right
Left Column	Centre Column	Right Column	Left Column	Centre Column	Right Column

As can be see in Table 5.4, well maybe not due to the overlap... the included `tabular` environment in L^AT_EX does not restrict a table to being a specific size; it is completely up to the user to determine if a table will overflow and, if it does, to break or change the layout to make the data fit. On the other hand, the `tabularx` package allows us to set the width of the table and inform it which columns should be scaled to fit the data and the `tabularx` package will handle the heavy lifting for us. Thus creating a table that, firstly, fits in the space one specifies and, secondly, re-flows the data to fit the cells rather than running the contents into neighbouring content or into the margins and off the page.

`tabularx` uses similar formats to the `tabular` environment, except there is an additional column type: `X`. This column type, or one of the derivatived column types shown below, must be included in the use of a `tabularx` table. Failing to do so will cause an error. The additional column types that one might like to create for use with the `tabularx` environment are as follows (Note that the `X` column type is a Fully Justified Auto Sizing Column):

- `C` - Centred Auto Sizing Column

```
\newcolumnntype{C}{>{\centering\arraybackslash}X}
```

- **L** - Left Justified Auto Sizing Column

`\newcolumntype{L}{>\raggedright\arraybackslash}X}`

- **R** - Right Justified Auto Sizing Column

`\newcolumntype{R}{>\raggedleft\arraybackslash}X}`

These new column types should be included in the preamble (before the `\begin{document}`); better yet, to help keep things organized it is recommended to include them in the `includeMacros.tex` file.

Table 5.5: This is a basic table

Left Aligned Title	Centred Title	Right Aligned Title
This is left aligned	This is centred	This is right aligned
This is left aligned	This is centred	This is right aligned
This is left aligned	This is centred	This is right aligned
This is left aligned	This is centred	This is right aligned

In the following table, [Table 5.6](#), we use the `multirow` and `multicol` packages. These two packages allows one to merge cells together in a table. Beyond this, to include horizontal lines, the `\cmidrule(1{<length>}r{<length>}){start_cell-end_cell}` from the `booktabs` package is used. To add a bit of a cleaner look the lines can be trimmed by including the `l{<length>}` or `r{<length>}` in the **round** brackets to trim the lines by the specified length for the left and right sides, respectively. Note that both line trim specifications do not need to be specified, in-fact one or none can be provide if the line does not need to be trimmed, *e.g.*, `\cmidrule{1-5}` or `\cmidrule(r{3em}){2-3}`.

Table 5.6: This is a complex table.

This is two row	This is two columns	
	Centred Title	Right Aligned Title
This is two row	This is centred	This is right aligned
	This is centred	This is right aligned
This is two row	This is centred	This is right aligned
	This is centred	This is right aligned

5.4 Figures

This section will provide examples of how to create figures, and different types of multi/sub-figures. Additionally, if you have many figures in a section and they are bleeding too much into the following sections a `\clearpage` command can be issued before the next section. However, note that this will force the next section to begin on a new page. Note that the first “figure” is actually a **plate**; a plate is the proper title associated with a *photograph*, however, is not always used in every department... if your are unsure **ask your supervisor** if the use of plates is common. Using the environment `plate` instead of `figure` and command `\listofplates` will generate everything for you.

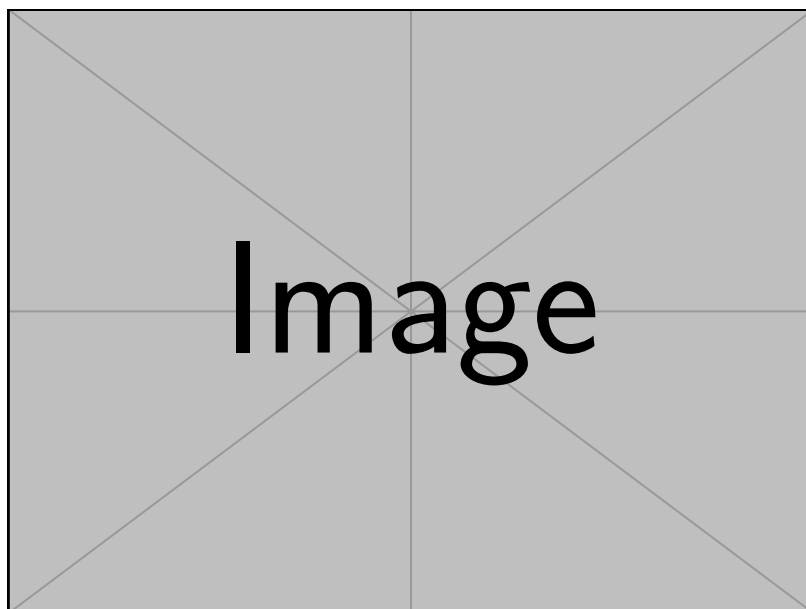


Plate 5.1: This is an example of a single image plate.

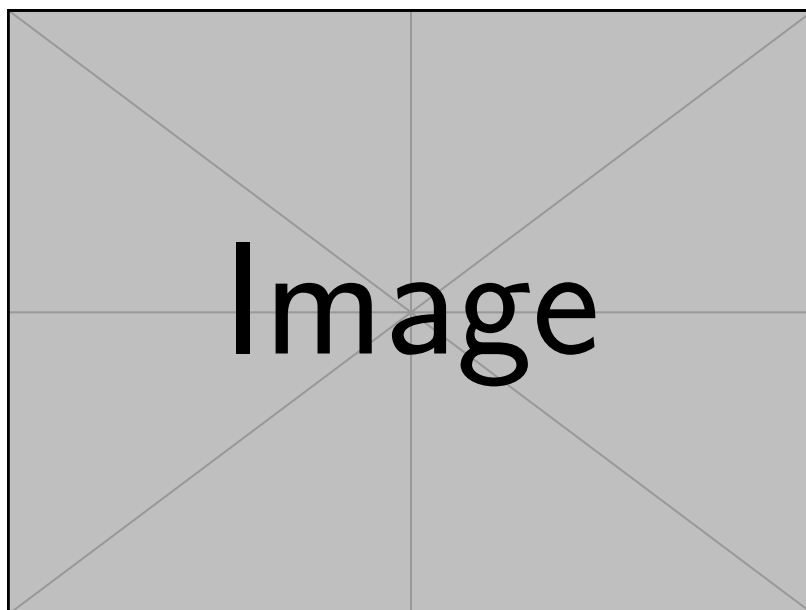


Figure 5.1: This is an example of a single figure.

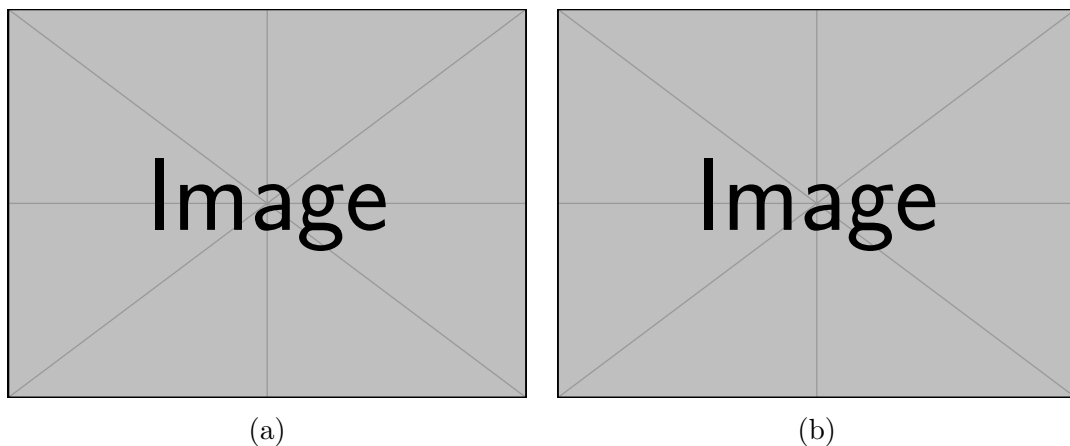


Figure 5.2: This is an example of a double image figure.

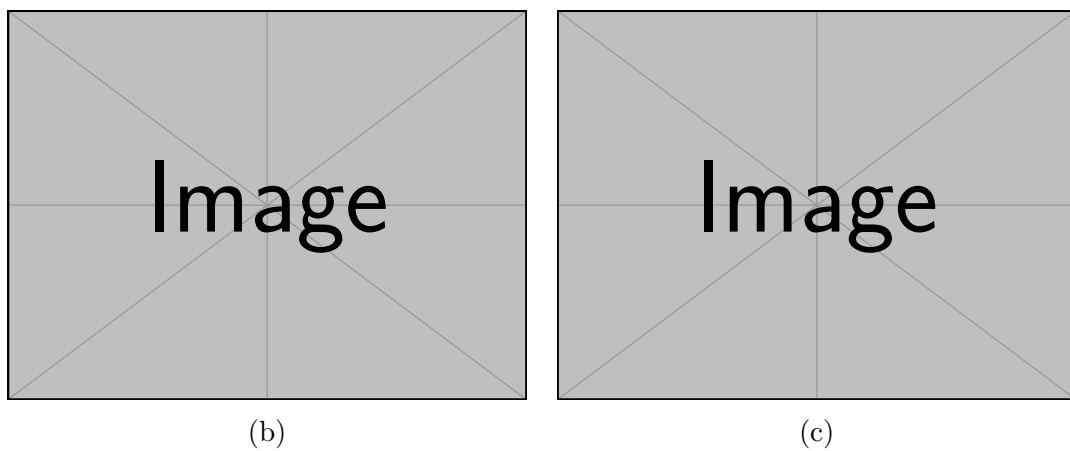
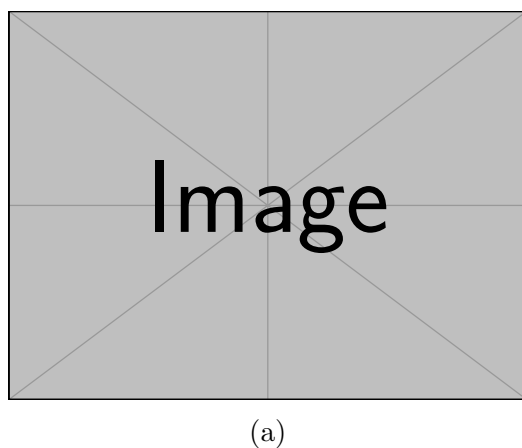
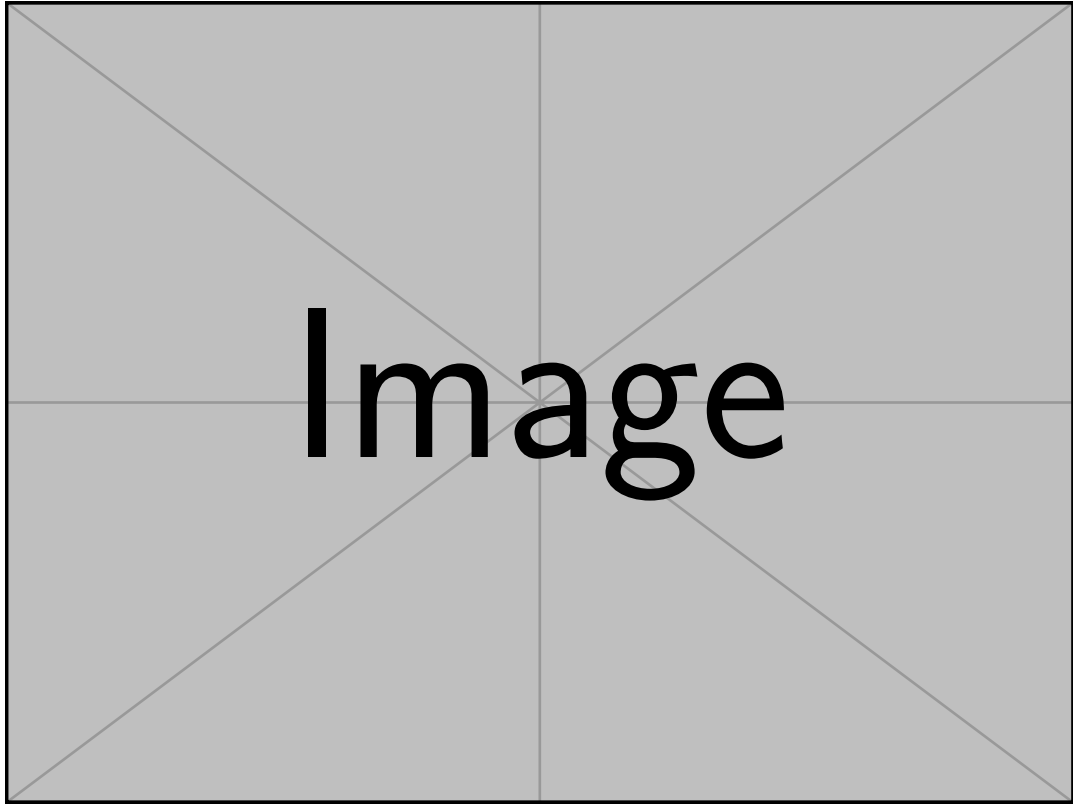
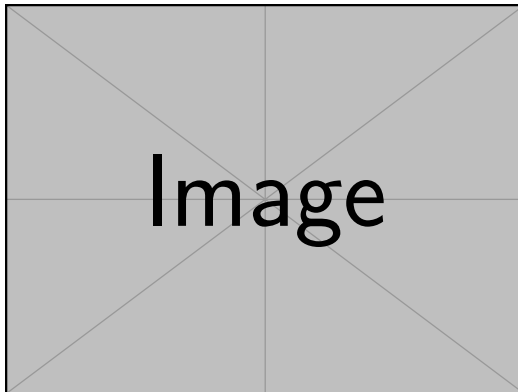


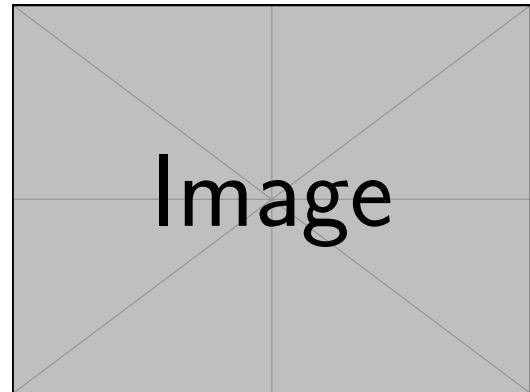
Figure 5.3: This is an example of a triple image figure.



(a)

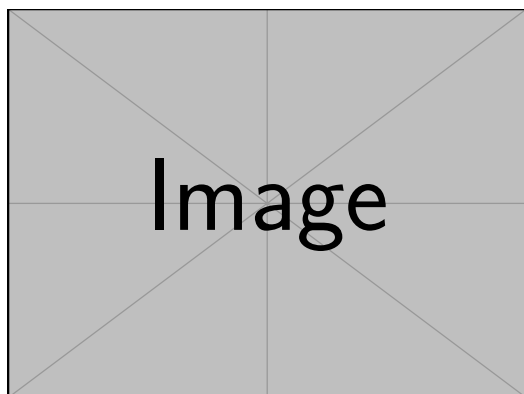


(b)

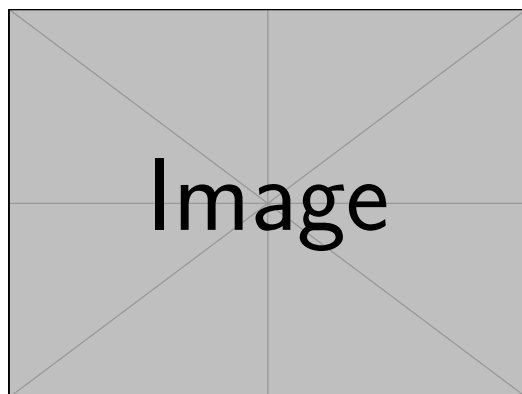


(c)

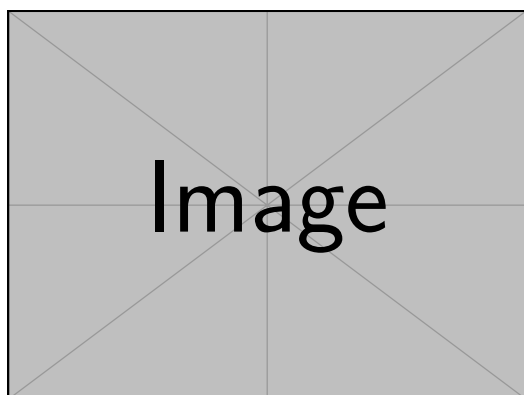
Figure 5.4: This is a second example of a triple image figure.



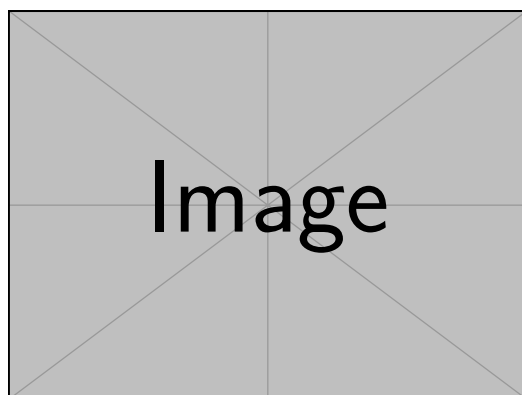
(a)



(b)



(c)



(d)

Figure 5.5: This is an example of a quad image figure.

5.5 Graphs & Plots

In the following section there will be a few examples of how to generate plots. Though this can be quite useful, I will be excluding indepth information on creating these. For more information on how to create plots, [here](#) is the manual for pgfplots.

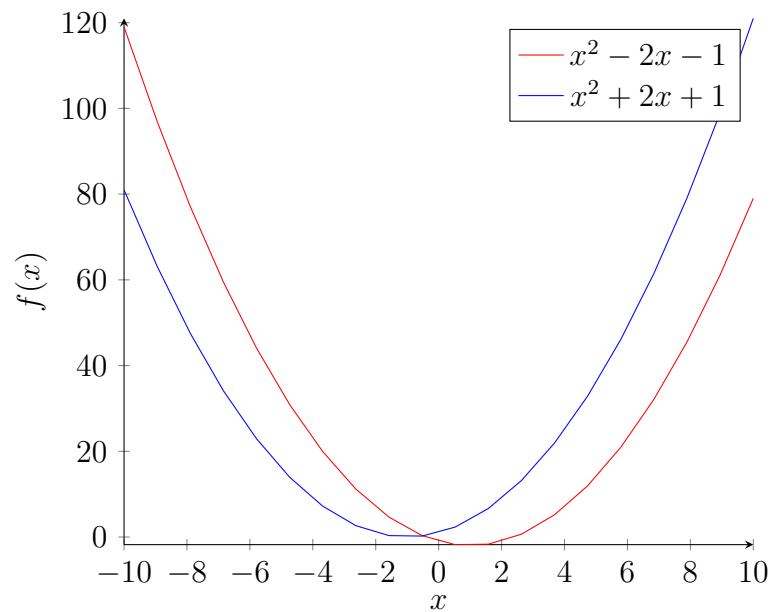


Figure 5.6: Plot of two parabola.

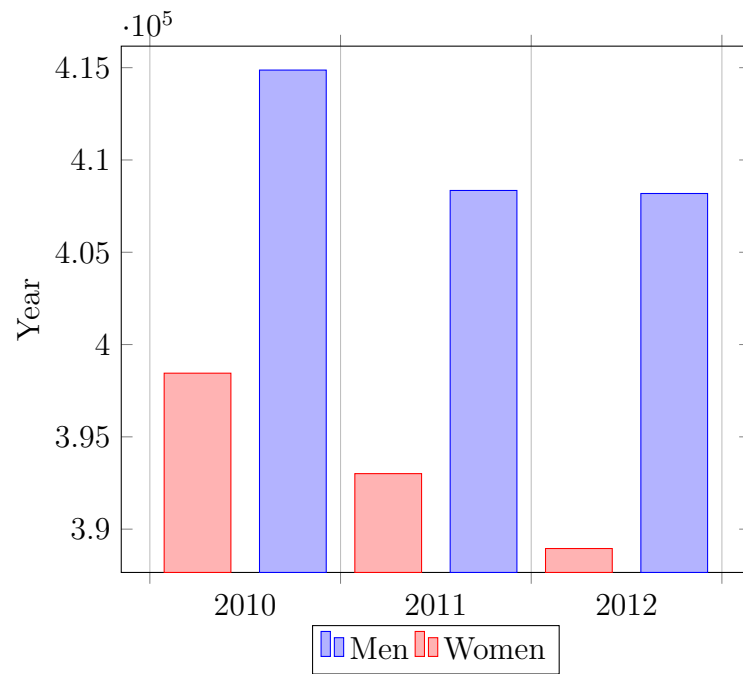


Figure 5.7: Example of a Bar Graph.

Example using the mesh parameter

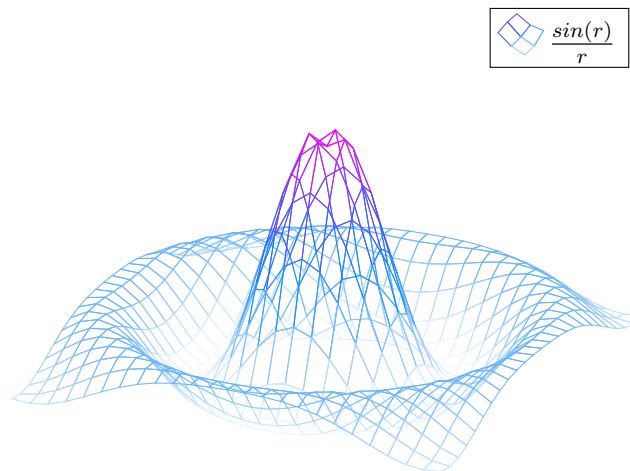


Figure 5.8: Example of a 3D Plot

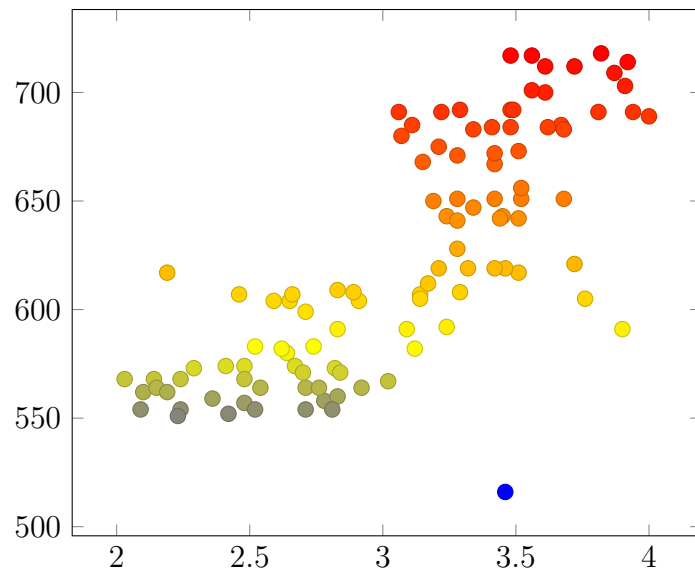


Figure 5.9: Example of a Scatter Plot.

If you have multiple equations that you want arranged very neatly, use the align environment and you can assign individual equations numbers as shown in Equations (5.2) to (5.4). Note that it is the & symbol that determines what will be aligned. Further note that spaces in “math mode” are ignored and need to be specified using the space commands in

$$\text{Equation1} = 1 \tag{5.2}$$

$$\text{Equation2} = 2 + 2 \tag{5.3}$$

$$\text{Equation3} = 3 + 3 + 3 \tag{5.4}$$

Table 5.7: Math Mode Greek Letters

Command	Output	Command	Output	Command	Output
<code>\alpha</code>	α	<code>\beta</code>	β	<code>\gamma</code>	γ
<code>\delta</code>	δ	<code>\epsilon</code>	ϵ	<code>\zeta</code>	ζ
<code>\eta</code>	η	<code>\theta</code>	θ	<code>\iota</code>	ι
<code>\kappa</code>	κ	<code>\lambda</code>	λ	<code>\mu</code>	μ
<code>\nu</code>	ν	<code>\xi</code>	ξ	<code>\omicron</code>	\omicron
<code>\pi</code>	π	<code>\rho</code>	ρ	<code>\sigma</code>	σ
<code>\tau</code>	τ	<code>\upsilon</code>	υ	<code>\phi</code>	ϕ
<code>\chi</code>	χ	<code>\psi</code>	ψ	<code>\omega</code>	ω
<code>A</code>	A	<code>B</code>	B	<code>\Gamma</code>	Γ
<code>\Delta</code>	Δ	<code>E</code>	E	<code>Z</code>	Z
<code>H</code>	H	<code>\Theta</code>	Θ	<code>I</code>	I
<code>K</code>	K	<code>\Lambda</code>	Λ	<code>M</code>	M
<code>N</code>	N	<code>\Xi</code>	Ξ	<code>O</code>	O
<code>\Pi</code>	Π	<code>P</code>	P	<code>\Sigma</code>	Σ
<code>T</code>	T	<code>\Upsilon</code>	Υ	<code>\Phi</code>	Φ
<code>X</code>	X	<code>\Psi</code>	Ψ	<code>\Omega</code>	Ω

Table 5.8: Blackboard Bold Letters

Command	Output	Command	Output	Command	Output
<code>\mathbb{A}</code>	A	<code>\mathbb{B}</code>	B	<code>\mathbb{C}</code>	C
<code>\mathbb{D}</code>	D	<code>\mathbb{E}</code>	E	<code>\mathbb{F}</code>	F
<code>\mathbb{G}</code>	G	<code>\mathbb{H}</code>	H	<code>\mathbb{I}</code>	I
<code>\mathbb{J}</code>	J	<code>\mathbb{K}</code>	K	<code>\mathbb{L}</code>	L
<code>\mathbb{M}</code>	M	<code>\mathbb{N}</code>	N	<code>\mathbb{O}</code>	O
<code>\mathbb{P}</code>	P	<code>\mathbb{Q}</code>	Q	<code>\mathbb{R}</code>	R
<code>\mathbb{S}</code>	S	<code>\mathbb{T}</code>	T	<code>\mathbb{U}</code>	U
<code>\mathbb{V}</code>	V	<code>\mathbb{W}</code>	W	<code>\mathbb{X}</code>	X
<code>\mathbb{Y}</code>	Y	<code>\mathbb{Z}</code>	Z		

It may be very important in a math heavy thesis to be able to show your equations, or even data in a readable way. For this, we will explore some of the ways to create specific data.

5.6.1 Vector, Sets, Piecewise Functions, Matrix Math, and More

$$f(x) = \begin{cases} x^{2*\ln x}, & \text{if } x < 3 \\ -\frac{x}{2}, & \text{if } 3 \leq x \leq 4 \\ x, & \text{if } 4 < x \end{cases} \quad (5.5)$$

Vectors and Matrices are used in many fields of math and science and provide a

Table 5.9: Calligraphic Letters

Command	Output	Command	Output	Command	Output
<code>\mathcal{A}</code>	\mathcal{A}	<code>\mathcal{B}</code>	\mathcal{B}	<code>\mathcal{C}</code>	\mathcal{C}
<code>\mathcal{D}</code>	\mathcal{D}	<code>\mathcal{E}</code>	\mathcal{E}	<code>\mathcal{F}</code>	\mathcal{F}
<code>\mathcal{G}</code>	\mathcal{G}	<code>\mathcal{H}</code>	\mathcal{H}	<code>\mathcal{I}</code>	\mathcal{I}
<code>\mathcal{J}</code>	\mathcal{J}	<code>\mathcal{K}</code>	\mathcal{K}	<code>\mathcal{L}</code>	\mathcal{L}
<code>\mathcal{M}</code>	\mathcal{M}	<code>\mathcal{N}</code>	\mathcal{N}	<code>\mathcal{O}</code>	\mathcal{O}
<code>\mathcal{P}</code>	\mathcal{P}	<code>\mathcal{Q}</code>	\mathcal{Q}	<code>\mathcal{R}</code>	\mathcal{R}
<code>\mathcal{S}</code>	\mathcal{S}	<code>\mathcal{T}</code>	\mathcal{T}	<code>\mathcal{U}</code>	\mathcal{U}
<code>\mathcal{V}</code>	\mathcal{V}	<code>\mathcal{W}</code>	\mathcal{W}	<code>\mathcal{X}</code>	\mathcal{X}
<code>\mathcal{Y}</code>	\mathcal{Y}	<code>\mathcal{Z}</code>	\mathcal{Z}		

convenient way to represent 2-Dimensional arrays of numbers.

$$x \in \{1, 2, 3, 4, 5, 6, 7\} \quad (5.6)$$

$$V_1 = \begin{pmatrix} a, & b, & c, & d \end{pmatrix} \quad (5.7)$$

$$V_2 = \begin{pmatrix} a \\ b \\ c \\ d \end{pmatrix} \quad (5.8)$$

$$M = \begin{bmatrix} a & b & c & d \\ e & f & g & h \\ i & j & k & l \\ m & n & o & p \end{bmatrix} \quad (5.9)$$

Table 5.10: Fraktur Letters

Command	Output	Command	Output	Command	Output
<code>\mathfrak{A}</code>	ℒ	<code>\mathfrak{B}</code>	℔	<code>\mathfrak{C}</code>	ℭ
<code>\mathfrak{D}</code>	℔	<code>\mathfrak{E}</code>	ℭ	<code>\mathfrak{F}</code>	ℱ
<code>\mathfrak{G}</code>	ℭ	<code>\mathfrak{H}</code>	ℱ	<code>\mathfrak{I}</code>	ℐ
<code>\mathfrak{J}</code>	ℐ	<code>\mathfrak{K}</code>	℔	<code>\mathfrak{L}</code>	ℒ
<code>\mathfrak{M}</code>	℔	<code>\mathfrak{N}</code>	℔	<code>\mathfrak{O}</code>	℔
<code>\mathfrak{P}</code>	℔	<code>\mathfrak{Q}</code>	℔	<code>\mathfrak{R}</code>	℔
<code>\mathfrak{S}</code>	℔	<code>\mathfrak{T}</code>	℔	<code>\mathfrak{U}</code>	℔
<code>\mathfrak{V}</code>	℔	<code>\mathfrak{W}</code>	℔	<code>\mathfrak{X}</code>	℔
<code>\mathfrak{Y}</code>	℔	<code>\mathfrak{Z}</code>	℔		

Chapter 6

JabRef: Managing Bibliographies Efficiently

6.1 Introduction

JabRef stands as a powerful tool for researchers and academics engaged in scholarly writing. JabRef offers a robust solution for bibliography management, including a number of features to ensure that you are not only able to organize your references but keep track of progress, and notes on each reference. This chapter aims to provide an review of JabRef, including its myriad features that I find particularly useful, and to guide you through its implementation in writing your thesis.

6.2 Key Features of JabRef

JabRef, with its versatile features, emerges as an indispensable tool for bibliography/reference management. Delving deeper into its functionalities reveals a wealth of tools designed to streamline the often cumbersome process of handling references.

6.2.1 BibTeX Compatibility

JabRef's commitment to the BibTeX format is a testament to its roots in the L^AT_EX ecosystem. This compatibility ensures a seamless integration between the reference management process and the L^AT_EX document preparation workflow. Users can easily export and import BibTeX files, facilitating collaboration and compatibility across

various platforms.

6.2.2 Reference Import

The capability to import references directly from online databases and journal websites significantly accelerates the reference collection process. JabRef supports various import formats, allowing users to effortlessly populate their databases with accurate and structured reference information. This feature is particularly valuable for researchers dealing with large/extensive bibliographies.

6.2.3 Customizable Entry Types

The flexibility offered by customizable entry types allows users to categorize references based on the nature of the source. Whether it's a book, article, conference proceeding, or any other reference type, JabRef accommodates diverse sources, ensuring a well-organized and easily navigable bibliography.

6.2.4 Search and Filter

The ability to efficiently search and filter references is a hallmark of JabRef's usability. Researchers dealing with extensive databases will appreciate the quick and precise retrieval of references based on author names, titles, keywords, or any other criteria. This feature is crucial for maintaining order in a rapidly growing bibliography.

6.2.5 Grouping

JabRef's grouping functionality provides a systematic approach to organizing references. Users can create custom groups to categorize references based on themes, projects, or any other criteria. This feature is especially useful for large research projects where a systematic organization of references is essential for maintaining clarity and coherence.

6.2.6 Integration with L^AT_EX

The seamless integration of JabRef with L^AT_EX editors fortifies the synergy between bibliography management and document preparation. This integration minimizes the manual effort required for citation insertion and ensures consistency between the bibliography and the in-text citations. Users can easily copy citation keys from JabRef and paste them directly into their L^AT_EX documents.

6.3 Getting Started with JabRef

Now that we’ve outlined the key features of JabRef, let’s embark on a comprehensive guide on how to get started with JabRef. This step-by-step walkthrough will cover everything from installation to creating a new bibliography and populating it with references.

6.3.1 Installation

The initial step in utilizing JabRef is to install the software on your system. For all users, regardless of OS, the easiest way to download JabRef is to visit their website: <https://www.jabref.org/>. Once there select ‘Download’ from the navigation bar, and press the “Download JabRef” button. This will take you to the FossHub page where you can select the appropriate version for your OS and download and install it.

6.3.2 Creating a New Bibliography

Once JabRef is successfully installed, launch the application. When the program loads you will be faced with a window that looks like the one shown in **Figure 6.1**.

Now that the program is open, to create a new bibliography:

1. Click on ‘File → New Library’ to create a new reference database.

To save the database:

1. Click on ‘File → Save Library’.

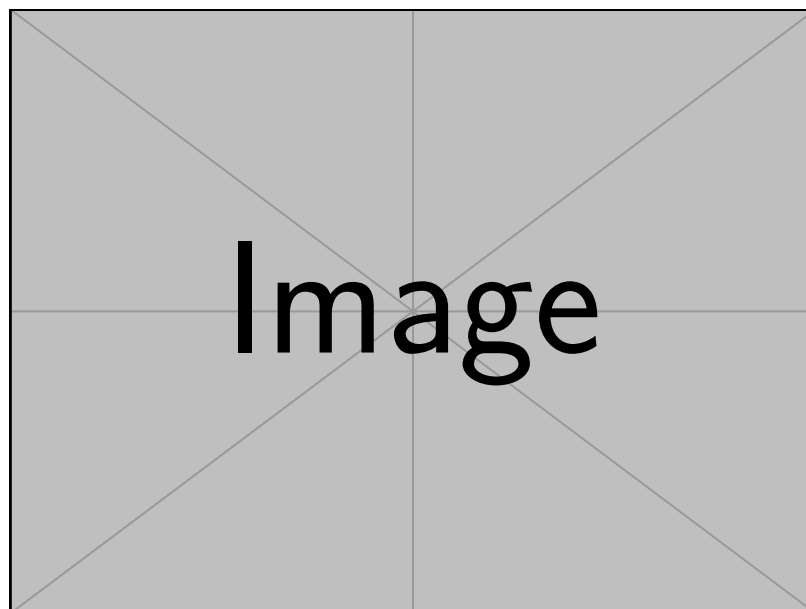


Figure 6.1: This is an example of a single figure.

2. Choose an appropriate and location.
3. Click 'Save'.

Congratulations! You've initiated your bibliography using JabRef. Now that we have this created, the next step is to add references to the database.

6.3.3 Adding References

JabRef offers multiple avenues for adding references to your database. Some of the methods are generally more useful than others but we will go over a few that you are likely to use:

Web Search

JabRef's integrated web search feature simplifies the process of importing references from online sources. This is by-far the easiest way to enter a reference.

1. Click on 'Web Search'.
2. Search for the desired reference using the integrated search feature.

3. Select the reference all the references you wish to import.
4. Click ‘Import entries’ to import the selected entries.
5. The references are added to your library.

Manual Entry

To manually enter a reference:

1. Click Library → ‘New entry’ or use the shortcut ‘Ctrl + N’.
2. Choose the entry type (*e.g.*, article, book, inproceedings).
3. Fill in the required fields like author, title, journal, *etc.*

By following these steps, you can efficiently populate your JabRef database with the necessary references.

6.3.4 Organizing References

Effectively organizing references is essential for a streamlined bibliography. JabRef’s grouping feature allows you to categorize references based on your preferences:

1. On the left panel, select ‘Add Group’.
2. Give the group an appropriate name.
3. Optionally you can add a Description, Icon, Colour, *etc.*

To assign a reference to a group:

1. Select the Reference(s) from the center list.
2. Drag them to the group on the left of the screen.

Note: Groups can even be nested into groups to provide more levels of organization.

Organizing references into groups enhances accessibility and facilitates a more systematic approach to bibliography management.

6.4 Example: Building a Bibliography

Now, let's apply the acquired knowledge by building a sample bibliography for a hypothetical research paper. This ongoing example will serve as a practical illustration of JabRef's features and their application in real-world scenarios.

6.4.1 Initial References

To initiate our bibliography, let's add a few references related to the research topic:

Reference 1

Author: John A. Researcher

Title: Advances in LaTeX

Journal: Journal of Scientific Typesetting

Year: 2021

Reference 2

Author: Alice B. Scholar

Title: The Art of BibTeX

Book Title: BibTeX Unleashed

Publisher: Tech Publishing

Year: 2022

These initial references lay the foundation for our bibliography. In the subsequent sections, we will build upon this foundation, exploring more features of JabRef and expanding our bibliography.

6.5 Exploring Advanced Features of JabRef

JabRef's capabilities extend beyond the basics covered in the previous sections. In this section, we'll explore advanced features that enhance the efficiency and effectiveness of reference management.

6.5.1 Custom Fields and Entry Types

JabRef allows users to define custom fields and entry types to accommodate diverse reference types. This flexibility ensures that the software adapts to the specific needs of various research projects.

To create a custom field:

1. Open the entry editor for a reference.
2. Click on 'Add Field' and enter the field name.
3. Enter the field value.
4. Click 'OK' to save the custom field.

Custom entry types can be defined similarly, providing a tailored solution for unique reference sources.

6.5.2 Quality Assurance: Checking and Correcting Entries

Ensuring the accuracy and completeness of references is crucial. JabRef provides tools for quality assurance, allowing users to check and correct entries.

To check for duplicate entries:

1. Click on 'Quality → Check integrity'.
2. JabRef will identify and display duplicate entries.

To correct entries:

1. Click on ‘Quality → BibTeX key generator’.
2. JabRef will suggest a BibTeX key based on the available information.

These quality assurance features contribute to maintaining a clean and error-free bibliography.

6.5.3 Managing PDFs and File Links

JabRef facilitates the management of associated PDFs and file links, offering a consolidated approach to reference and document management.

To link a PDF or file:

1. Open the entry editor for a reference.
2. Click on ‘General’ and use the ‘PDF’ or ‘File’ field to link the document.

This integration streamlines the retrieval of associated documents directly from JabRef.

6.5.4 Collaboration: Sharing and Syncing Databases

For collaborative research projects, JabRef supports the sharing and syncing of databases, ensuring seamless collaboration among team members.

To share a database:

1. Click on ‘File → Share Database’.
2. Choose a method for sharing, such as via cloud storage or a version control system.

Syncing databases allows multiple users to work on the same reference library concurrently, enhancing collaboration.

6.6 Conclusion

This section provided a comprehensive overview of JabRef, covering its key features, installation, and practical steps for creating and managing bibliographies. The ongoing example illustrated the application of JabRef in building a bibliography for a research paper.

The subsequent exploration of advanced features demonstrated JabRef's versatility in handling diverse reference sources, ensuring quality assurance, managing associated files, facilitating collaboration, and extending functionality through plugins.

As we continue to delve into JabRef's capabilities, the following sections will focus on specific aspects, providing in-depth insights and practical examples to empower users in harnessing the full potential of JabRef for efficient bibliography management in LaTeX documents.

Chapter 7

Background

7.1 General Information

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7.2 Specific Information

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7.3 Gap in Research

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7.4 Conclusions

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Chapter 8

Paper 1

8.1 Introduction

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8.2 Methods and Procedure

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8.3 Results and Discussion

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8.4 Conclusions

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Aliquam lectus. Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tortor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum, magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in, placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.

Chapter 9

Paper 2

9.1 Introduction

Nullam eleifend justo in nisl. In hac habitasse platea dictumst. Morbi nonummy. Aliquam ut felis. In velit leo, dictum vitae, posuere id, vulputate nec, ante. Maecenas vitae pede nec dui dignissim suscipit. Morbi magna. Vestibulum id purus eget velit laoreet laoreet. Praesent sed leo vel nibh convallis blandit. Ut rutrum. Donec nibh. Donec interdum. Fusce sed pede sit amet elit rhoncus ultrices. Nullam at enim vitae pede vehicula iaculis.

Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Aenean nonummy turpis id odio. Integer euismod imperdiet turpis. Ut nec leo nec diam imperdiet lacinia. Etiam eget lacus eget mi ultricies posuere. In placerat tristique tortor. Sed porta vestibulum metus. Nulla iaculis sollicitudin pede. Fusce luctus tellus in dolor. Curabitur auctor velit a sem. Morbi sapien. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Donec adipiscing urna vehicula nunc. Sed ornare leo in leo. In rhoncus leo ut dui. Aenean dolor quam, volutpat nec, fringilla id, consectetur vel, pede.

Nulla malesuada risus ut urna. Aenean pretium velit sit amet metus. Duis iaculis. In hac habitasse platea dictumst. Nullam molestie turpis eget nisl. Duis a massa id pede dapibus ultricies. Sed eu leo. In at mauris sit amet tortor bibendum varius. Phasellus justo risus, posuere in, sagittis ac, varius vel, tortor. Quisque id enim.

Phasellus consequat, libero pretium nonummy fringilla, tortor lacus vestibulum nunc, ut rhoncus ligula neque id justo. Nullam accumsan euismod nunc. Proin vitae ipsum ac metus dictum tempus. Nam ut wisi. Quisque tortor felis, interdum ac, sodales a, semper a, sem. Curabitur in velit sit amet dui tristique sodales. Vivamus mauris pede, lacinia eget, pellentesque quis, scelerisque eu, est. Aliquam risus. Quisque bibendum pede eu dolor.

9.2 Methods and Procedure

In hac habitasse platea dictumst. Proin at est. Curabitur tempus vulputate elit. Pellentesque sem. Praesent eu sapien. Duis elit magna, aliquet at, tempus sed, vehicula non, enim. Morbi viverra arcu nec purus. Vivamus fringilla, enim et commodo malesuada, tortor metus elementum ligula, nec aliquet est sapien ut lectus. Aliquam mi. Ut nec elit. Fusce euismod luctus tellus. Curabitur scelerisque. Nullam purus. Nam ultricies accumsan magna. Morbi pulvinar lorem sit amet ipsum. Donec ut justo vitae nibh mollis congue. Fusce quis diam. Praesent tempus eros ut quam.

Donec in nisl. Fusce vitae est. Vivamus ante ante, mattis laoreet, posuere eget, congue vel, nunc. Fusce sem. Nam vel orci eu eros viverra luctus. Pellentesque sit amet augue. Nunc sit amet ipsum et lacus varius nonummy. Integer rutrum sem eget wisi. Aenean eu sapien. Quisque ornare dignissim mi. Duis a urna vel risus pharetra imperdiet. Suspendisse potenti.

Morbi justo. Aenean nec dolor. In hac habitasse platea dictumst. Proin nonummy porttitor velit. Sed sit amet leo nec metus rhoncus varius. Cras ante. Vestibulum commodo sem tincidunt massa. Nam justo. Aenean luctus, felis et condimentum lacinia, lectus enim pulvinar purus, non porta velit nisl sed eros. Suspendisse consequat. Mauris a dui et tortor mattis pretium. Sed nulla metus, volutpat id, aliquam eget, ullamcorper ut, ipsum. Morbi eu nunc. Praesent pretium. Duis aliquam pulvinar ligula. Ut blandit egestas justo. Quisque posuere metus viverra pede.

9.3 Results and Discussion

Nunc velit. Nullam elit sapien, eleifend eu, commodo nec, semper sit amet, elit. Nulla lectus risus, condimentum ut, laoreet eget, viverra nec, odio. Proin lobortis. Curabitur dictum arcu vel wisi. Cras id nulla venenatis tortor congue ultrices. Pellentesque eget pede. Sed eleifend sagittis elit. Nam sed tellus sit amet lectus ullamcorper tristique. Mauris enim sem, tristique eu, accumsan at, scelerisque vulputate, neque. Quisque lacus. Donec et ipsum sit amet elit nonummy aliquet. Sed viverra nisl at sem. Nam diam. Mauris ut dolor. Curabitur ornare tortor cursus velit.

Morbi tincidunt posuere arcu. Cras venenatis est vitae dolor. Vivamus scelerisque semper mi. Donec ipsum arcu, consequat scelerisque, viverra id, dictum at, metus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut pede sem, tempus ut, porttitor bibendum, molestie eu, elit. Suspendisse potenti. Sed id lectus sit amet purus faucibus vehicula. Praesent sed sem non dui pharetra interdum. Nam viverra ultrices magna.

Aenean laoreet aliquam orci. Nunc interdum elementum urna. Quisque erat. Nullam tempor neque. Maecenas velit nibh, scelerisque a, consequat ut, viverra in, enim. Duis magna. Donec odio neque, tristique et, tincidunt eu, rhoncus ac, nunc. Mauris malesuada malesuada elit. Etiam lacus mauris, pretium vel, blandit in, ultricies id, libero. Phasellus bibendum erat ut diam. In congue imperdiet lectus.

9.4 Conclusions

Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetur tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci,

scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo.

Aliquam lectus. Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tortor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum, magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in, placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.

Chapter 10

Conclusions, Recommendations, & Future Work

10.1 Conclusions

Nullam eleifend justo in nisl. In hac habitasse platea dictumst. Morbi nonummy. Aliquam ut felis. In velit leo, dictum vitae, posuere id, vulputate nec, ante. Maecenas vitae pede nec dui dignissim suscipit. Morbi magna. Vestibulum id purus eget velit laoreet laoreet. Praesent sed leo vel nibh convallis blandit. Ut rutrum. Donec nibh. Donec interdum. Fusce sed pede sit amet elit rhoncus ultrices. Nullam at enim vitae pede vehicula iaculis.

Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Aenean nonummy turpis id odio. Integer euismod imperdiet turpis. Ut nec leo nec diam imperdiet lacinia. Etiam eget lacus eget mi ultricies posuere. In placerat tristique tortor. Sed porta vestibulum metus. Nulla iaculis sollicitudin pede. Fusce luctus tellus in dolor. Curabitur auctor velit a sem. Morbi sapien. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Donec adipiscing urna vehicula nunc. Sed ornare leo in leo. In rhoncus leo ut dui. Aenean dolor quam, volutpat nec, fringilla id, consectetur vel, pede.

Nulla malesuada risus ut urna. Aenean pretium velit sit amet metus. Duis iaculis. In hac habitasse platea dictumst. Nullam molestie turpis eget nisl. Duis a massa id pede dapibus ultricies. Sed eu leo. In at mauris sit amet tortor bibendum varius.

Phasellus justo risus, posuere in, sagittis ac, varius vel, tortor. Quisque id enim. Phasellus consequat, libero pretium nonummy fringilla, tortor lacus vestibulum nunc, ut rhoncus ligula neque id justo. Nullam accumsan euismod nunc. Proin vitae ipsum ac metus dictum tempus. Nam ut wisi. Quisque tortor felis, interdum ac, sodales a, semper a, sem. Curabitur in velit sit amet dui tristique sodales. Vivamus mauris pede, lacinia eget, pellentesque quis, scelerisque eu, est. Aliquam risus. Quisque bibendum pede eu dolor.

10.2 Future Work

Fusce suscipit cursus sem. Vivamus risus mi, egestas ac, imperdiet varius, faucibus quis, leo. Aenean tincidunt. Donec suscipit. Cras id justo quis nibh scelerisque dignissim. Aliquam sagittis elementum dolor. Aenean consectetur justo in pede. Curabitur ullamcorper ligula nec orci. Aliquam purus turpis, aliquam id, ornare vitae, porttitor non, wisi. Maecenas luctus porta lorem. Donec vitae ligula eu ante pretium varius. Proin tortor metus, convallis et, hendrerit non, scelerisque in, urna. Cras quis libero eu ligula bibendum tempor. Vivamus tellus quam, malesuada eu, tempus sed, tempor sed, velit. Donec lacinia auctor libero.[1]

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- [5] A. four, “Article 4,” *Journal 4*, 1990.
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Appendix A: First Appendix

A.1 Section 1

Nullam eleifend justo in nisl. In hac habitasse platea dictumst. Morbi nonummy. Aliquam ut felis. In velit leo, dictum vitae, posuere id, vulputate nec, ante. Maecenas vitae pede nec dui dignissim suscipit. Morbi magna. Vestibulum id purus eget velit laoreet laoreet. Praesent sed leo vel nibh convallis blandit. Ut rutrum. Donec nibh. Donec interdum. Fusce sed pede sit amet elit rhoncus ultrices. Nullam at enim vitae pede vehicula iaculis.

Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Aenean nonummy turpis id odio. Integer euismod imperdiet turpis. Ut nec leo nec diam imperdiet lacinia. Etiam eget lacus eget mi ultricies posuere. In placerat tristique tortor. Sed porta vestibulum metus. Nulla iaculis sollicitudin pede. Fusce luctus tellus in dolor. Curabitur auctor velit a sem. Morbi sapien. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Donec adipiscing urna vehicula nunc. Sed ornare leo in leo. In rhoncus leo ut dui. Aenean dolor quam, volutpat nec, fringilla id, consectetur vel, pede.

Nulla malesuada risus ut urna. Aenean pretium velit sit amet metus. Duis iaculis. In hac habitasse platea dictumst. Nullam molestie turpis eget nisl. Duis a massa id pede dapibus ultricies. Sed eu leo. In at mauris sit amet tortor bibendum varius. Phasellus justo risus, posuere in, sagittis ac, varius vel, tortor. Quisque id enim. Phasellus consequat, libero pretium nonummy fringilla, tortor lacus vestibulum nunc, ut rhoncus ligula neque id justo. Nullam accumsan euismod nunc. Proin vitae ipsum

ac metus dictum tempus. Nam ut wisi. Quisque tortor felis, interdum ac, sodales a, semper a, sem. Curabitur in velit sit amet dui tristique sodales. Vivamus mauris pede, lacinia eget, pellentesque quis, scelerisque eu, est. Aliquam risus. Quisque bibendum pede eu dolor.

A.2 Section 2

Fusce suscipit cursus sem. Vivamus risus mi, egestas ac, imperdiet varius, faucibus quis, leo. Aenean tincidunt. Donec suscipit. Cras id justo quis nibh scelerisque dignissim. Aliquam sagittis elementum dolor. Aenean consectetur justo in pede. Curabitur ullamcorper ligula nec orci. Aliquam purus turpis, aliquam id, ornare vitae, porttitor non, wisi. Maecenas luctus porta lorem. Donec vitae ligula eu ante pretium varius. Proin tortor metus, convallis et, hendrerit non, scelerisque in, urna. Cras quis libero eu ligula bibendum tempor. Vivamus tellus quam, malesuada eu, tempus sed, tempor sed, velit. Donec lacinia auctor libero.

Appendix B: Second Appendix

B.1 Section 1

Nullam eleifend justo in nisl. In hac habitasse platea dictumst. Morbi nonummy. Aliquam ut felis. In velit leo, dictum vitae, posuere id, vulputate nec, ante. Maecenas vitae pede nec dui dignissim suscipit. Morbi magna. Vestibulum id purus eget velit laoreet laoreet. Praesent sed leo vel nibh convallis blandit. Ut rutrum. Donec nibh. Donec interdum. Fusce sed pede sit amet elit rhoncus ultrices. Nullam at enim vitae pede vehicula iaculis.

Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Aenean nonummy turpis id odio. Integer euismod imperdiet turpis. Ut nec leo nec diam imperdiet lacinia. Etiam eget lacus eget mi ultricies posuere. In placerat tristique tortor. Sed porta vestibulum metus. Nulla iaculis sollicitudin pede. Fusce luctus tellus in dolor. Curabitur auctor velit a sem. Morbi sapien. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Donec adipiscing urna vehicula nunc. Sed ornare leo in leo. In rhoncus leo ut dui. Aenean dolor quam, volutpat nec, fringilla id, consectetur vel, pede.

Nulla malesuada risus ut urna. Aenean pretium velit sit amet metus. Duis iaculis. In hac habitasse platea dictumst. Nullam molestie turpis eget nisl. Duis a massa id pede dapibus ultricies. Sed eu leo. In at mauris sit amet tortor bibendum varius. Phasellus justo risus, posuere in, sagittis ac, varius vel, tortor. Quisque id enim. Phasellus consequat, libero pretium nonummy fringilla, tortor lacus vestibulum nunc, ut rhoncus ligula neque id justo. Nullam accumsan euismod nunc. Proin vitae ipsum

ac metus dictum tempus. Nam ut wisi. Quisque tortor felis, interdum ac, sodales a, semper a, sem. Curabitur in velit sit amet dui tristique sodales. Vivamus mauris pede, lacinia eget, pellentesque quis, scelerisque eu, est. Aliquam risus. Quisque bibendum pede eu dolor.

B.2 Section 2

Fusce suscipit cursus sem. Vivamus risus mi, egestas ac, imperdiet varius, faucibus quis, leo. Aenean tincidunt. Donec suscipit. Cras id justo quis nibh scelerisque dignissim. Aliquam sagittis elementum dolor. Aenean consectetur justo in pede. Curabitur ullamcorper ligula nec orci. Aliquam purus turpis, aliquam id, ornare vitae, porttitor non, wisi. Maecenas luctus porta lorem. Donec vitae ligula eu ante pretium varius. Proin tortor metus, convallis et, hendrerit non, scelerisque in, urna. Cras quis libero eu ligula bibendum tempor. Vivamus tellus quam, malesuada eu, tempus sed, tempor sed, velit. Donec lacinia auctor libero.

Appendix C: Third Appendix

C.1 Section 1

Listing C.1: This is a caption for the inserted code

```
function [outputs] = functionName(inputs)
%{
    This is a Comment Block
    That
    can
    span
    multiple
    lines.
%}

% This is a regular comment
a = 1 + 2 * sin(angle);
b = 'This is a String';
```

C.2 Section 2

Listing C.2: This is a caption for the inserted code

```
#include <iostream>
using namespace std;
/* This function adds two integer values
 * and returns the result
 */
int sum(int num1, int num2){
    int num3 = num1 + num2; return num3;
}

int main(){
    //Calling the function
    cout << 'The sum is:' << sum(1,99);
    return 0;
}
```

Appendix D: Inserting PDFs

D.1 how to insert a portrait PDF

This is an Example PDF that is Portrait

This is the second page

D.2 How to insert a landscape PDF

This is an Example PDF that is Landscape

This is the second page