A LaTeX template to Typeset Your Thesis for Submission to the Faculty/School of Graduate Studies

by

© *my-name*

A

thesis submitted to the

Department of Computer Sc. & Engineering

in partial fulfillment of the

requirements for the degree of

Master of Engineering **or** Doctor of Philosophy

Department of *dept-name*

Rajasthan Technical University, Kota

Month Year

Abstract

This document provides information on how to write your thesis using the LaTeX document preparation system. You can use these files as a template for your own thesis, just replace the content, as necessary. You should put your real abstract here, of course.

"The purpose of the abstract, which should not exceed 150 words for a Masters' thesis or 350 words for a Doctoral thesis, is to provide sufficient information to allow potential readers to decide on relevance of the thesis. Abstracts listed in Dissertation Abstracts International or Masters' Abstracts International should contain appropriate key words and phrases designed to assist electronic searches."

Acknowledgements

Put your acknowledgements here...

"Intellectual and practical assistance, advice, encouragement and sources of monetary support should be acknowledged. It is appropriate to acknowledge the prior publication of any material included in the thesis either in this section or in the introductory chapter of the thesis."

— Name of the candidate

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Chapter 1

Introduction

1.1 Getting started

This is the introductory chapter. This will give you some ideas on how to use LaTeX [4] to typeset your document. Here is a sample quote using the `\quote` environment [5]:

> *"LaTeX is a system for typesetting documents. Its first widely available version, mysteriously numbered 2.09, appeared in 1985. LaTeX is now extremely popular in the scientific and academic communities, and it is used extensively in industry. It has become a* lingua franca *of the scientific world; scientists send their papers electronically to colleagues around the world in the form of LaTeX input. "*

The citation at the end is optional — if you don't need it, then use `\quote` without any arguments:

> *"Here is a quote that does not have an associated citation after it. You can specify the citation before or after the quote manually. "*

By default, all text is double spaced, however, quotes and footnotes must be

singled spaced. [1] The left margin is slightly wider than the right margin. This is to compensate for binding.

More material is to be added from References

An example mathematical formulae is show in Equation 1.1.

$$\sum_{i=0}^{n} i^2 \tag{1.1}$$

A slightly more complicated equation is given in Equation 1.2: [2]

$$i\hbar\frac{\partial}{\partial t}\Psi(x,\,t) = -\frac{\hbar^2}{2m}\nabla^2\Psi(x,\,t) + V(x)\Psi(x,\,t) \tag{1.2}$$

1.2 Cross References

In addition to using `\ref` to refer to equations, you can also use it (in conjunction with the `\label` command) to refer to sections and chapters without hard coding the numbers themselves. For example, this is Section 1.2 of Chapter 1. You can also refer to Appendix A, Subsection 1.6.1.1 below or any other place that has a `\label`. You can also use labels to refer to a page. For example, Chapter 3 starts on page 10.

1.3 Some Suggestions

Here are a few recommendations:

- Before using this template, make sure you check with your supervisor.

[1] This is a single spaced footnote. SGS requires that footnotes be singled spaced and this can be done with the `\footnote` command.

[2] Equation taken from the *Schrödinger equation* entry on *Wikipedia*

- RTU's library provides electronic access to some LaTeX related textbooks which can be read online. Use the search term `latex (computer file)` on the Library's web page.
- If you run into a problem, Google may be a helpful resource.
- Concentrate on content, let LaTeX handle the typesetting.
- Don't worry about warnings related to:
  - overfull `hboxes/boxes`
  - underfull `hboxes/vboxes`

  These can be corrected with modest rewording of your text prior to submission of your final copy.

1.4 Changing Fonts

Change fonts: Large, `verbatim ~@#$%^&*(){}[]`,

Small Caps,

slanted text,

emphasized text,

`typewriter text`.

1.5 Accents and Ligatures

Some accents: é è ô ü ç ï í ñ ā ă ă

Some ligatures: flæffi

1.6 Some Lists

Here is a nested enumeration:

1. An enumerated list of items.
    (a) which can
    (b) nest
        i. to arbitrary
        ii. levels
2. More items
3. in the top
4. level list.

Another enumeration:

1. (a) Main 1 part 1
    (b) Main 1 part 2
2. (a) Main 2 part 1
    (b) Main 2 part 2

1.6.1 Subsection

This is one subsection.....

1.6.1.1 Subsubsection

This section is referred to by Section 1.2.

1.6.1.2 Subsubsection

<Empty subsection>

Chapter 2

Figures

2.1 Figures

We can include encapsulated PostScript™ figures (`.eps`) in the document and refer to it using a label. For example, RTU's logo can be seen in Figure 2.1. Figure 2.2 shows Minimization table for finite automata.[1]

Figure 2.1: RTU Logo.

The figure was created using the Calc spreadsheet application of the office suite OpenOffice.org.[2] This figure was reduced by 50%.

[1] From *Finite automata by .....*

[2] This office suite can be downloaded at no cost from `http://openoffice.org/`. Unlike other

For larger figures, we can use landscape mode to rotate the page and display the figure using the `\figure` command, as shown in Figure 2.2. The figure will be the only thing on the page when typeset in landscape mode. (The figure is reduced to 85% of its original size.)

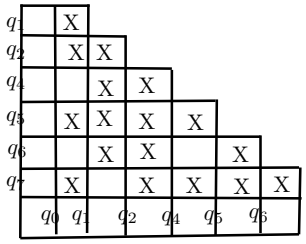

Figure 2.2: Minimization table for finite automata.

Alternatively, if we just want to rotate the figure, but not the entire page, we can specify an `angle` attribute in the default argument of the `\figure` command. The result is shown in Figure 2.3. If the figure is too large or if there isn't sufficient text, then the figure may appear on its own page.

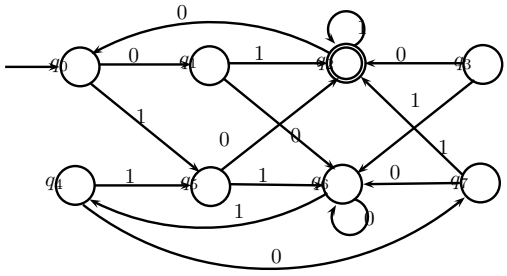

Figure 2.3: Minimized finite automata.

commercial office suites, OpenOffice.org may be legally shared with colleagues and fellow students. There are versions for Linux, Microsoft Windows, Mac OS X and Solaris. Also, unlike commercial offerings, OpenOffice.org does not require activation using registration keys.

Note that all three of the enrollment figures are basically the same file, but with different names — on Linux, they are symbolic links to the same file. The filenames have to be different because the reference labels need to be unique.

Figure 2.4 shows a relation between context-free and regular languages. This figure has been expanded to 130% of its original size.

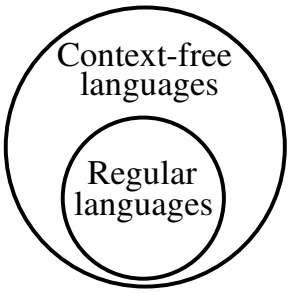

Figure 2.4: Relation between context-free and regular languages.

2.1.1 Sub-figures

You need to add a separate `\caption` for each subfigure in order to display the label (which can then be referenced):

(a) (b)

Figure 2.5: (a) shows Figure 1 and (b) shows Figure 2.

2.1.2 Text-figures

We can also create figures of text (such as short code snippets) using the `\txtfig` command, as show in Figure 2.6.

```
#include <stdio.h>
int main(int argc, char **argv)
{
  printf("Hello world!\n");
  exit(0);
}
```

Figure 2.6: Simply words.

```
[
  'foo',
  'bar',
  'baz',
]
```

(a) Simply words

```
[
  3,
  2,
  1,
]
```

(b) And numbers here

Figure 2.7: Very code. Much geek. Wow!

Chapter 3

Tables

3.1 Introduction

Tables are common elements in most scientific documents, LaTeX provides a large set of tools to customize tables, change the size, combine cells, change the colour of cells and so on.

Below you can see the simplest working example of a table.

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

The tabular environment is the default LaTeX method to create tables. You must specify a parameter to this environment, c c c tells LaTeX that there will be three columns and that the text inside each one of them must be centered.

3.2 Creating a simple table in LaTeX

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

It was already said that the tabular environment is used to type tables. To be more clear about how it works below is a description of each command.

$\{|c|c|c|\}$:

This declares that three columns, separated by a vertical line, are going to be used in the table. Each c means that the contents of the column will be centred, you can also use r to align the text to the right and l for left alignment.

`\hline`

This will insert a horizontal line on top of the table and at the bottom too. There is no restriction on the number of times you can use `\hline`.

cell1 & cell2 & cell3

Each & is a cell separator and the double-backslash \\ sets the end of this row.

Below you can see a second example.

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

Table 3.1: PTU Fall Semester Enrollment (fictitious!).

	Undergraduate			Graduate		
	F/T	P/T	Total	F/T	P/T	Total
2004	13,191	2,223	15,414	1,308	879	2,187
2005	13,184	2,143	15,327	1,375	920	2,295
2006	12,809	2,224	15,033	1,373	899	2,272
2007	12,634	2,155	14,789	1,403	899	2,302
2008	12,269	2,208	14,477	1,410	1,005	2,415
2009	12,382	2,323	14,705	1,567	1,106	2,673

3.3 More complex Tables

We can also create tables, as seen by Table 3.1. Note that, as required by SGS guidelines, the caption for a table appears above the table whereas figure captions appear below the figures. Tables and figures can "float" — they may not appear on the page on which they are mentioned. LaTeX tries to handle figure and table placement intelligently, but if if you have a lot of them without a reasonable amount of surrounding textual content, the figures and tables can accumulate towards the end of the chapter. Generally speaking, if there is sufficient text explaining the tables and figures or if the tables/figures are relatively small, this may not be a problem. However, if you have a lot of tables or figures, it may be a good idea to put them in an appendix and refer to them as the need arises.

Chapter 4

All files & processes

4.1 List of files

You have following files in this demo of thesis writing guidelines:

1. thesis.tex : Root file of the thesis script
2. thesis.sty : Style file of thesis.tex
3. abstract.tex : abstract of thesis
4. ack.tex : acknowledgement in the thesis
5. apdxa.tex : appendix to the thesis
6. chap1.tex : chapter 1 file
7. chap2.tex : chapter 2 file
8. chap3.tex : chapter 3 file

9. chap4.tex : chapter 4 file
10. chap5.tex : chapter 5 file
11. chap6.tex : chapter 6 file
12. chap7.tex : chapter 7 file
13. ref.bib : references file in biblatex format
14. biblatex.sty : sty file for bibliography format
15. figures.zip : zip file of figures folder
16. thesis.pdf : pdf file of final thesis created in pdf format

4.2 Editing Chapters files

4.3 Creating root file

4.4 Creating ref.bib file

4.5 Figures files

4.6 Configuring the Latex

Chapter 5

Dealing with Errors

LaTeX can produce cryptic error messages at times. However, with some experience, it is usually not too difficult to determine what the problem is and how to fix it.

As mentioned earlier, appropriate search terms in Google may help you fix these error messages.

Chapter 6

Bibliography management with Bibtex

6.1 Introduction

BibTeX is a widely used bibliography management tool in LaTeX, with BibTeX the bibliography entries are kept in a separate file and then imported into the main document.

Once the external bibliography file is imported, the command `\cite` is used just as in the introductory

Ths document is an example of BibTeX using in bibliography management. Three items are cited: *The LaTeX Companion* book [2], the Einstein journal paper [1], and the Donald Knuth's website [3]. The LaTeX related items are [2, 3].

`\bibliographystyle{siam}`

and

`\bibliography{samaple}`

BibTEX can be used to handle all your bibliographic needs. Simply add references to the file `ref.bib` and BibTEX will take care of the rest. An example of a BibTEX book, conference paper and journal article are given in the sample `ref.bib` file. Many online journals have links to BibTEX citations that you can download and incorporate into the `ref.bib` file.

The order of the fields is unimportant. BibTEX will display them in the correct order when constructing your bibliography. Also note that you can specify information about a reference that may not even be included in the actual bibliography. For example, the ISBN field is not required by the bibliography, but you can, if you want, put the ISBN to the BibTEX entry.

We can cite a journal article [6] and a conference paper [5] in the same way as a book citation. More information can be found in [4].

6.2 The bibliography file

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

This file contains records in a special format, for instance, the first bibliographic reference is defined by:

@article{...}

This is the first line of a record entry, @article denotes the entry type and tells BibTeX that the information stored here is about an article. Besides the entry types

shown in the example (article, book and misc) there are a lot more, see the reference guide.

einstein The label einstein is assigned to this entry, is an identifier that can be used to refer this article within the document.

author = "Albert Einstein",

This is the first field in the bibliography entry, indicates that the author of this article is Albert Einstein. Several comma-separated fields can be added using the same syntax key = value, for instance: title, pages, year, URL, etc. See the reference guide for a list of possible fields.

The information in this file can later be used within a LaTeX document to include these references, as shown in the next subsection.

6.3 Adding the bibliography in the table of contents

There are two ways of including the bibliography in the table of contents, either manually adding it or using the package tocbibind (recommended).

To add it manually just insert the next line right before the command follow these commands:

```
\begin{thebibliography}

\bibliography

\addcontentsline{toc}{chapter}{Bibliography}
```

For books and reports there are two ways of including the bibliography in the table of contents, either manually adding it or using the package tocbibind (recommended).

c

```
\addcontentsline{toc}{section}{References}
```

Chapter 7

Conclusions and Future Work

That's all friends!

Appendix A

Appendix title

This is Appendix A.

You can have additional appendices too (*e.g.*, `apdxb.tex`, `apdxc.tex`, *etc.*).

If you do not need any appendices, delete the appendix related lines from `thesis.tex`.

References

[1] A. Einstein. Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]. *Annalen der Physik*, 322(10):891–921, 1905.

[2] M. Goossens, F. Mittelbach, and A. Samarin. *The LaTeX Companion*. Addison-Wesley, Reading, Massachusetts, 1993.

[3] D. Knuth. Knuth: Computers and typesetting.

[4] L. Lamport. *LaTeX: A Document Preparation System*. Addison-Wesley Publishing Company, second edition, 1994.

[5] F. LastName, F. I. LastName, and F. LastName Jr. Conference paper title. In *Proceedings of the Conference of Sample Conferences*, pages 100–110, Apr. 1996.

[6] F. name Last-name and S. Guy. Journal article SWGC title. *Journal of Sample Journals*, 1(12):1000–1024, 2002.

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