# Dissertation Title, that can span over

## multiple lines if needed

First Last

Submitted to the Faculty of the Graduate School

of Augusta University in partial fulfillment

of the Requirements of the Degree of

Master of Science

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# Acknowledgements

This part serves two purposes.

To write the acknowledgments (as a "*Thank you note*"). You can look for inspiration [2] if you need some.

To include a detailed summary of the work performed by other authors on published or accepted manuscripts used in the thesis / dissertation, if applicable.

# Abstract

First Last

Dissertation Title, that can span over multiple lines if needed

Under the direction of Dr. Advisor

The abstract must not exceed 350 words. It must consist of the briefest possible summary of the thesis / dissertation and the conclusions reached. Explanatory matter and opinion must be omitted.

Keywords: Key1· Key2· A longer keyword

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# 1. Introduction

This document is a guide on how to use it ("how meta!"), and its structure does not reflect the structure of a Thesis: you will need to erase (almost) all of its body and fill it with your own, organized in a coherent manner respectful of your reader's expectations, of your fields guidelines, and in agreement with your advisor.

It is very important that you comply with all of the graduate school's policies [1]. This template was carefully crafted with highest standards in mind, and respects all of the graduate schools requirements. You can find additional information on the "The Graduate School Reference Center: ETD Templates & Preparation Booklet" or, more generally, on this template's repository.

Normally, what you can and cannot edit is clearly labeled in the source code, either at the beginning of the file, or with

> ⚠ Do not edit ⚠

**Markdown only** The comments applicable only to the markdown version of this document are indicated in such environments.

## 1.1. Title Levels

As indicated in the koma-script manual, the class `scrbook` that is used for this document has access to 6 levels of titles:

```
\chapter{Test}
\section{Test}
\subsection{Test}
\subsubsection{Test}
\paragraph{Test}
\subparagraph{Test}
```

Only Chapters, Sections and Subsections will appear in the table of contents, by design.

**Markdown only** Note that pandoc's # corresponds to Chapter, and that increasing the number of # increases the level of heading.

### 1.1.1. Subsection

This is a subsection.

#### 1.1.1.1. Subsubsection

This is a subsubsection.

**1.1.1.1.1. Paragraph** This is a paragraph.

**1.1.1.1.1.1. Sub-Paragraph** This is a sub-paragraph.

## 1.2. Debugging

If this template does not "work" as expected, feel free to open an issue or reach out to caubert@augusta.edu, after having looked at `aux/input.log` as (probably) indicated by latexmk.

You are welcome to reach out to or through github's issue tracker.

# 2. References and Bibliography

Prepare your references using LaTeX's bibliography system BibTeX: this template uses by default biblatex, but you can alter this behaviour to use natbib if you prefer.

The references are stored in the .bib file located at `references/references.bib`: it contains examples of various entries. In computer science, a good source of bibliographical references is the dblp computer science bibliography. Make sure to include the digital object identifier (DOI) whenever possible, and note that this identifier can be used to obtain the corresponding .bib entry. Finally, you can "tidy" your .bib file using bibtex-tidy.

The list of references is automatically inserted in the list of references, p. 16. Use LaTeX's `\cite` command to insert references.

Links are only underlined *on screen* (and not in print), and with colors that should be colour-blind safe.

**Markdown only** You can use various syntaxes to integrate references: on top of LaTeX's `\cite` command, pandoc's `[@key]`, as well as more complex commands, such as `\citeauthor` or pandoc's prefix, locator, and suffix, such as in `[see @key1, pp. 33-35and *passim*; @key2, chap. 1]`.

You can insert hyperlinks in different ways, including hyperlinks to this document[1] using e.g. the link automatically added to all chapters, following the convention described in pandoc's manual.

[1] You may note that the footnote number is itself a link.

# 3. Writing Mathematics

LaTeXcan be used to render complex mathematics expressions in a relatively simple manner. Note that thanks to XeLaTeX, you can insert mathematical symbols directly in unicode, as follows: $\forall y \in \mathbb{N}, \exists x \in \mathbb{N}, y = x^2$, but of course you can always fall back to usual LaTeX notation, using e.g. `\forall` to produce $\forall$.

You can add additional unicode symbols that may not be supported by this template or its font using the model

```
1 \newunicodechar{<unicode symbol>}{\ensuremath{<latex command>}}
```

(in `head_c.tex` in the markdown version), in this case additionally forcing the symbol `<unicode symbol>` to be rendered in math mode using `\ensuremath`.

## 3.1. Theorem, Proof, and Others Environments

**Markdown only** You can state e.g. theorems and proofs using pandoc's built-in "*Definition list*", that are rendered as `description` environments in LaTeX.

**Theorem** Every $n \in \mathbb{N}$, $n > 1$ has a unique prime factorization.

**Proof** Carl Friedrich Gauss told me so. □

To insert numbered theorems, definitions, and the like, and be able to reference them or add automatically the "qed" (□) symbol, you need to use LaTeX's `theorem` environment, `label`

commands, etc. Note that, by default, proofs are unnumbered environments, but that there are ways to reference them if you want to.

**Theorem 1** (Pythagoras theorem)**.** $\forall a, b, c, a^2 + b^2 = c^2$.

*Proof.* Proving Theorem 1 is not that easy. □

**Markdown only** If you would rather keep the "pure" markdown syntax but improve pandoc using a filter, you can look at the pandoc filter "statement" and its discussion on related filters, but it may be more difficult to install and use properly.

## 3.2. Formal Proofs

You can easily represent formal proofs using LaTeX's ebproof or bussproof packages:

$$\dfrac{A \vee B \qquad \begin{array}{c}[A]\\ \vdots \\ C\end{array} \qquad \begin{array}{c}[B]\\ \vdots \\ C\end{array}}{C}\ \vee\text{E}$$

# 4. Figures, Tables, (Code) Listings and Landscape Pages

## 4.1. Figures

**Markdown only** You can easily insert images and figures using Pandoc, as in Figure 1, a painting by Jérôme Minard under copyleft.

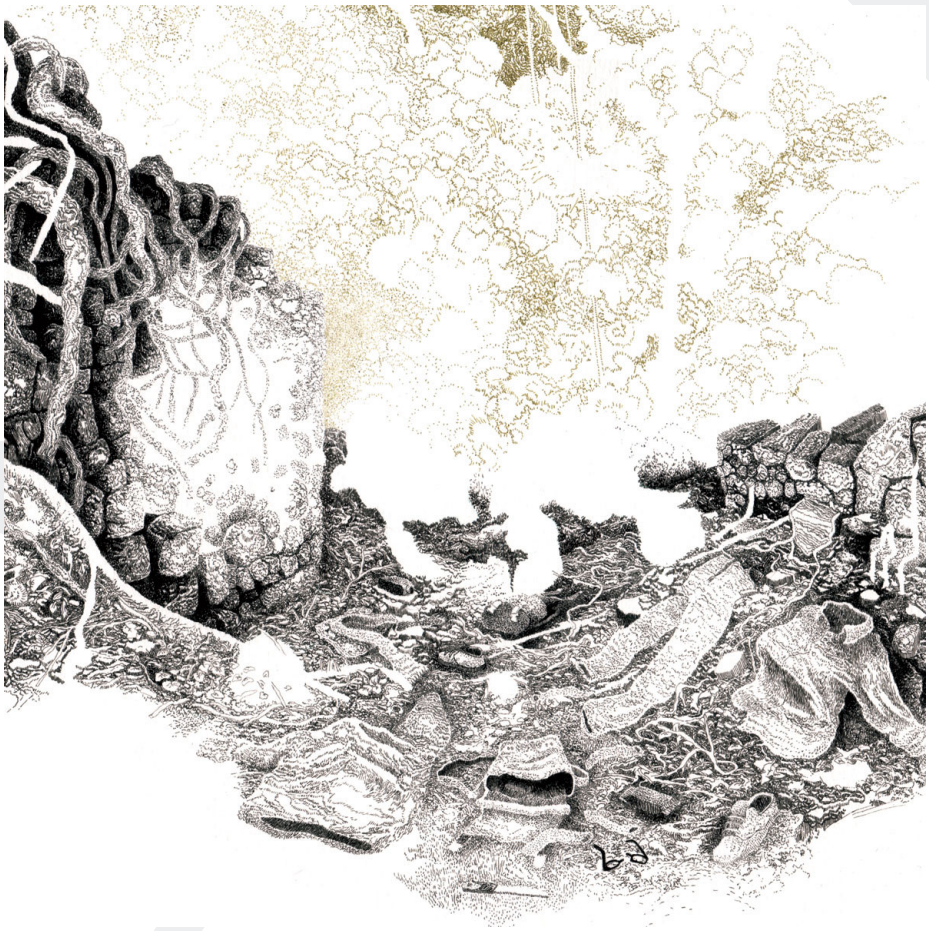

Figure 1.: *D'un autre âge*

## 4.2. Tables

**Markdown only** You can write tables using pandoc's syntax*es*, as in Tables 1, 2 and 3 (all borrowed from https://www.flutterbys.com.au/stats/tut/tut17.3.html).

Table 1.: The price of categories

| Column A | Column B | Column C |
|---|---|---|
| Category 1 | High 95.00 | 100.00 |
| High | | |
| Category 2 | High 82.50 | 80.50 |
| High | | |

Table 2.: Illustrating how to align entries in a table

| Default | Left | Center | Right |
|---|---|---|---|
| High | Cat 1 | A | 100.00 |
| High | Cat 2 | B | 85.50 |
| Low | Cat 3 | C | 80.00 |

Table 3.: The price and advantages of fruits

| Fruit | Price | Advantages |
|---|---|---|
| Bananas | $1.34 | • built-in wrapper<br>• bright color |
| Oranges | $2.10 | • cures scurvy<br>• tasty |

## 4.3. Code Listings

Code is displayed using the listings package. Check the "Table 1: Predefined languages" of the listings package documentation to see the list of supported languages by default.

**Markdown only** Your can display code using various possible syntaxes.

As a fenced block:

```
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, World");
    }
}
```

In a figure, as in Listings 1, 2 or 3 (that uses respectively the backtick, the tildes, and `listinputlisting` to display the code – this latter option allows to load a file directly).

```
(** Courtesy of https://coq.inria.fr/a-short-introduction-to-coq. **)
Inductive even : N → Prop :=
| even_0 : even 0
| even_S n : odd n → even (n + 1)
with odd : N → Prop :=
| odd_S n : even n → odd (n + 1).
```

Listing 1: An inductive definition in Coq

```
# Courtesy of https://stackoverflow.com/a/2188369
for num in {000..2}; do echo "$num"; done
```

Listing 2: How to use braces ({and }) in bash

```
/* Courtesy of Brian Kernighan and https://en.wikipedia.org/wiki/%22Hello,↲
    _World!%22_program#C */
#include <stdio.h>
int main(void)
{
    printf("Hello, world\n");
    return 0;
}
```

Listing 3: "*Hello World*" in C

## 4.4. Landscape Pages

You can obtain landscape pages using the landscape package in LaTeX.

**Markdown only** This feature is not accessible in pure markdown: if you want to have landscape pages, you need to use LaTeXcommands in your document.

Note that the drawing presented in Figure 2 was obtained using LaTeX's package tiKz, and that the source code is shared in the pictures folder.

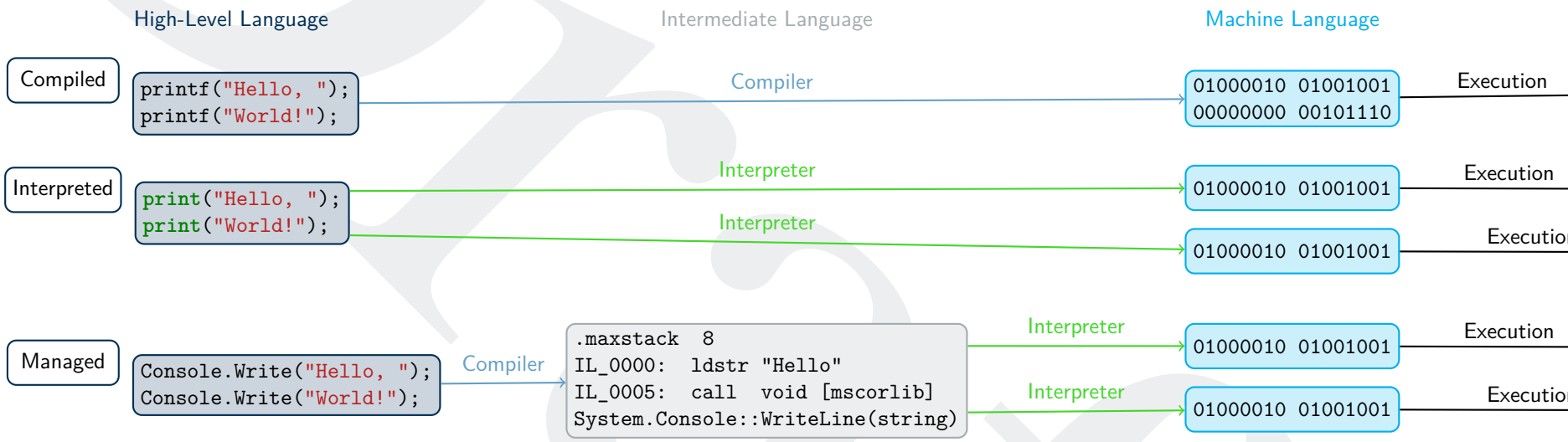


Figure 2.: Difference between programming languages (simplified)

# 5. Margins and Fonts

## 5.1. Margins

The margin have been set to fit the graduate school's requirements to:

---

Actual page layout values.

| | |
|---|---|
| `\paperheight` = 11.00215in | `\paperwidth` = 8.50166in |
| `\hoffset` = 0in | `\voffset` = 0in |
| `\evensidemargin` = 0.50009in | `\oddsidemargin` = 0.50009in |
| `\topmargin` = 0in | `\headheight` = 0in |
| `\headsep` = 0in | `\textheight` = 9.00177in |
| `\textwidth` = 6.00117in | `\footskip` = 0.70236in |
| `\marginparsep` = 0in | `\marginparpush` = 0in |
| `\columnsep` = 0in | `\columnseprule` = 0in |
| 1em = 0.16608in | 1ex = 0.07472in |

---

Please, do not change those values.

## 5.2. Fonts

### 5.2.1. Body

The font used in the body of the document is “TeX Gyre Termes Font Family”, which is an extension of the standard Times New Roman that is free for commercial use, and can be freely distributed. It is set to 12pt in all of the document, and adjusted when needed to the appropriate size (particularly in the cover page, where most attributes need to be set at 16pts).

The “usual” correspondence between points and LaTeXcommands is as follows:

tiny is equivalent to 6pt

scriptsize is equivalent to 8pt

footnotesize is equivalent to 10pt

small is equivalent to 10.95pt

normalsize is equivalent to 12pt

large is equivalent to 14.4pt

Large is equivalent to 17.28pt

LARGE is equivalent to 20.74pt

huge is equivalent to 24.88pt

# Huge is equivalent to 24.88pt

### 5.2.2. Symbols

For better unicode support, the Symbola font is also used. Starting with version 11, the licence of this font is too restrictive for non-personal use. As a consequence, users are asked to make sure they do not use a version greater than v.10.24, which is "free for any use" and archived on-line.

By default, the following symbols, not available in the TeX Gyre Termes Font Family, are displayed using Symbola: 🔒, ✘, ⚠, ?, SOON, ℕ, ℤ, ✔, ↩, ↲, ⌓, ℝ □. To declare other unicode symbols as having to be displayed using the Symbola font, use

```
1 \newunicodechar{<unicode symbol>}{\symb <unicode symbol>}
```

(in `head_c.tex` in the markdown version), so that `<unicode symbol>` will be rendered using the Symbola font.

# References

[1] Augusta University's Graduate School. *Forms, Policies, and Procedures*. July 2021. URL: https://www.augusta.edu/gradschool/student-resources.php (visited on 11/01/2021).

[2] Jane Chisholm. "WRITING ACKNOWLEDGEMENTS: Saying "Thank You"". In: *CETL 8723: Writing for International Graduate Students*. URL: https://esl.gatech.edu/sites/default/files/LI/li-how_to_write_acknowledgements_in_a_dissertation.pdf.

# A. Appendix A (Optional)

Insert here protocols, figures not included, larger listings, etc.