An Elegant LaTeX Template for Books

Classic ElegantLaTeX Template

Author: Ethan Deng & Liam Huang

Institute: ElegantLaTeX Program

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ElegantLaTeX Program

Victory won't come to us unless we go to it. — M. Moore

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Chapter 1 ElegantLaTeX Templates

On the occasion of this release, we, ElegantLaTeX Program, want to reintroduce our work to you. We are committed to creating a series of beautiful, elegant, easy to use LaTeX templates for users. The ElegantLaTeX is currently composed of ElegantNote, ElegantBook, ElegantPaper for typesetting notes, books, and working papers respectively.

The latest version is available on Github:ElegantBook/releases. This guide describes some settings of this template and how to use it. If you have any other questions, suggestions or comments, please feel free to contact us.

1.1 ElegantBook Updates

Over these years, we've received Einav and Cullen (2010) a lot of feedback from users, with major issues related to font installation, coding support, theorem class environments floats, theorem cross-page, cross-references, and etc. We really think about these problems, it wasn't elegant to let the user install the font for visual beauty since users got into a lot of trouble, which went against the concept of our template. So we've removed that from the new version, users don't have to install any fonts. Let's take a look at the ElegantBook template 3.x updates:

1. Remove custom font settings and use the `ctex` package or system font instead;
2. Add English and Chinese modes（`lang`=cn/en）;
3. `PDFLaTeX` and `XeLaTeX` Support;
4. Use the `tcolorbox` package to re-written the theorem class environments, which can span over pages;
5. Theorem class environments name updated, and cross-references fixed;
6. Color name updated, link color unified;
7. New ElegantLaTeX Logo;
8. New cover and decorations, remove the watermark;
9. Fix appendix;
10. Add gray theme: `color`=plain;
11. Add code highlighting;
12. Beautify the list environment.

Chapter 2 ElegantBook Settings

2.1 Compilation Methods

This template is based on the Standard LaTeX book class, so the options of book class also work. The default encoding is UTF-8, and TeX Live is recommended. The test environment is Win10 + TeX Live 2018.

2.1.1 Compile with PDFLaTeX

If you choose PDFLaTeX to process your book, the default article font computer modern has changed to newtx series, and the default font size is set to 12pt. The fonts are settings with:

- newtxtext package for text fonts, similar to times new roman font.
- newtxmath package for math fonts, close to times package.
- FiraMono package for typewriter fonts, with option scale=0.7.
- ctex package for Chinese fonts, with option scheme=plain.
  A full compilation chain：PDFLaTeX -> BibTeX -> PDFLaTeX*2.

2.1.2 Compile with XeLaTeX

If you choose XeLaTeX to process your book, we use fontspec package and xeCJK package. we used fonts available in Windows, if you are using Linux or Mac OS, please substitute these fonts with that of your system.

```
\RequirePackage{fontenc}
\RequirePackage[no-math]{fontspec}
\setmainfont{Times New Roman}[NFSSFamily=ntxtlf]
\setsansfont{Arial}
%\setmonofont[Scale=0.7]{Courier New}
\RequirePackage{xeCJK}
\RequirePackage{xunicode}
\setCJKmainfont[BoldFont={SimHei},ItalicFont={KaiTi}]{
    SimSun}
```

```
\setCJKsansfont[BoldFont={SimHei},ItalicFont={KaiTi}]{
    KaiTi}
\setCJKmonofont[BoldFont={SimHei},ItalicFont={KaiTi},
    Scale=0.7]{Microsoft YaHei}
\XeTeXlinebreaklocale "zh"
\XeTeXlinebreakskip = 0pt plus 1pt minus 0.1pt
\RequirePackage{newtxmath}
```

A full compilation chain：XeLaTeX -> BibTeX -> XeLaTeX*2.

2.2 Languages

We defined one option named `lang`, this option has two alternative values, `lang`=en (default) or `lang`=cn. `lang`=cn will make the caption of figure/table, abstract name, refname etc. Chinese, while `lang`=en will keep all these stuff English, as the default article class sets. You can use this option as

```
\documentclass[cn]{elegantbook}
\documentclass[lang=cn]{elegantbook}
\documentclass[en]{elegantbook}
\documentclass[lang=en]{elegantbook}
```

Remark: You can input Chinese Character in either `lang`=en or `lang`=cn. If you are using (`lstlisting`) environment, and it contains Chinese characters, please use XeLaTeX.

2.3 Color Themes

This template contains 4 color themes,they are green (default), cyan, blue, plain, and there is a customization color option `nocolor`. You can choose green with

```
\documentclass[green]{elegantbook} %or
\documentclass[color=green]{elegantbook}
```

where plain theme is gray for all theorem class environments and paper structures. If you want to customize the colors, please select `nocolor` or use `color`=none , then define the main, second, and third colors in the preamble section as follows:

```
\definecolor{main}{RGB}{70,70,70}
\definecolor{second}{RGB}{115,45,2}
\definecolor{third}{RGB}{0,80,80}
```

Table 2.1: ElegantBook Themes

	green	cyan	blue	Main Environments
main				definition
second				theorem lemma corollary
third				proposition

2.4 Chapter Title Display Styles

This template contains 2 sets of *title display styles*,which including `hang`(default) and `display` style,

The difference is that the chapter heading is displayed on a single line (`hang`) and on a double line (`display`) , and this guide uses `hang` . To change display style

```
\documentclass[hang]{elegantbook} %or
\documentclass[titlestyle=hang]{elegantbook}
```

2.5 Theorem Class Environments

In this template, we defined four categories of theorem class environments

- *Theorem Environment*, including title and contents, numbering within chapter. There are three types depending on the format
  - **definition** environment, the color is main;
  - **theorem, lemma, corollary** environment, the color is second;
  - **proposition** environment, the color is third.
- *Example Environments*, including **example, exercise, problem** environment, auto numering within chapter.
- *Proof Environment*, including **proof, note** environment, they contain introductory symbol (**note** environment) or ending symbol (**proof** environment).
- *Conclusion Environments*, including **conclusion, assumption, property, remark, solution** environment, all of these begin with boldfaced words, and the contents are the same as a normal paragraph.

2.5.1 Theorem Class Environments

The template uses the `tcolorbox` package to customize the theorem class environments, it is slightly different from the normal theorem environments. The usage is as follows:

```
\begin{theorem}{<theorem name>}{<label>}
The content of theorem.
\end{theorem}
```

The first parameter `<theorem name>` is the name of the theorem, and the second parameter `label` is the label used in cross-reference with `ref{thm:label}`. Note that cross-references must be prefixed with `thm:`. The effect is as follows:

Theorem 2.1: <theorem name>
The content of theorem.   ♡

Other theorem class environments with the same usage are:

Table 2.2: Theorem Class Environments

Environment	Label text	Prefix	Cross-reference
definition	label	def	`\ref{def:label}`
theorem	label	thm	`\ref{thm:label}`
lemma	label	lem	`\ref{lem:label}`
corrlary	label	cor	`\ref{cor:label}`
proposition	label	pro	`\ref{pro:label}`

2.5.2 Other Customized Environments

The other three math environments can be used directly since there are no options for them, the `example` environment usage:

```
\begin{example}
This is the content of example environment.
\end{example}
```

The effect is as follows:

Example 2.1: This is the content of example environment.

These are all the same environments, except that

- example, exercise, problem environments numbering within chapter;
- note with introductory symbol, proof with ending symbol;
- conclusion environment with boldfaced keywords and normal paragraph content.

2.6 Cover and Logo

The cover image used in this template is from pixabay.com¹. The image is completely free and can be used in any circumstance. The cover image size is 1280×1024, when changing the cover, please crop it according to the size of the cover picture strictly. Here is a free online image clipping site: befunky.com.

This Logo ratio is 1:1, that is square picture. In the replacement of the picture, please choose the appropriate picture to replace.

2.7 List Environments

This template uses `tikz` to customize `itemize` and `enumerate` environments, the `itemize` environment customized to the third depth, and `enumerate` environment customized to fourth depth. The effect is as follows

- first item of nesti;
- second item of nesti;
  - first item of nestii;
  - second item of nestii;
    - first item of nestiii;
    - second item of nestiii.

1. first item of nesti;
2. second item of nesti;
   (a). first item of nestii;
   (b). second item of nestii;
       I. first item of nestiii;
       II. second item of nestiii.

2.8 Bibliography

This template uses BIBTEX to generate the bibliography, the default bibliography style is `aer`. Let's take a glance at the citation effect, Chen et al. (2018) use data from a major peer-to-peer lending marketplace in China to study whether female and male investors evaluate loan performance differently.

If you want to use BIBTEX, you must create a file named `reference.bib`, and add bib items (from Google Scholar, Mendeley, EndNote, and etc.) to `reference.bib` file, and cite the bibkey in the `tex` file. The BibTEX will automatically generate the bibliography for you for the reference you cited. If you want to add some noncited reference to the bibliography, you can use

```
\nocite{EINAV2010, Havrylchyk2018}
```

---

¹Thank ChinaTEX for providing free image source site, and pexels.com is also recommended.

2.9 Preface

If you want to add a preface before the first chapter without changing the number of chapter, you can use it before the first chapter

```
\chapter*{Preface}
\addcontentsline{toc}{chapter}{Preface}
\markboth{Preface}{}
The content of Preface.
```

Chapter 3 ElegantBook Writing Sample

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

3.1 Writing Sample

We will define the integral of a measurable function in three steps. First, we define the integral of a nonnegative simple function. Let E be the measurable set in $\mathcal{R}^N$.

> **Definition 3.1: Left Coset**
>
> *Let H be a subgroup of a group G. A* left coset *of H in G is a subset of G that is of the form xH, where $x \in G$ and $xH = \{xh : h \in H\}$. Similarly a* right coset *of H in G is a subset of G that is of the form Hx, where $Hx = \{hx : h \in H\}$* ♣

Note: *Note that a subgroup H of a group G is itself a left coset of H in G.*

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.

> **Theorem 3.1: Lagrange's Theorem**
>
> *Let G be a finite group, and let H be a subgroup of G. Then the order of H divides the order of G.* ♡

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

> **Proposition 3.1: Size of Left Coset**
>
> *Let H be a finite subgroup of a group G. Then each left coset of H in G has the same number of elements as H.* ♠
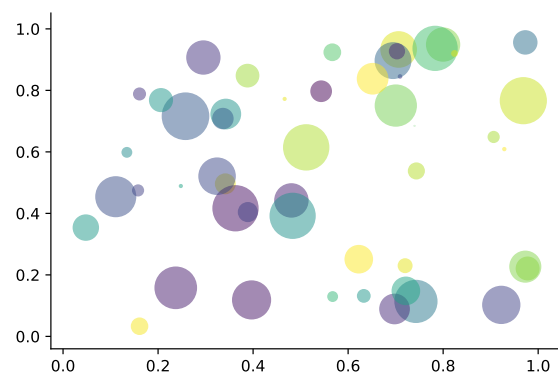

Figure 3.1: Matplotlib: Scatter Plot Example

Regression analysis is a powerful statistical method that allows you to examine the relationship between two or more variables of interest. While there are many types of regression analysis, at their core they all examine the influence of one or more independent variables on a dependent variable. The process of performing a regression allows you to confidently determine which factors matter most, which factors can be ignored, and how these factors influence each other.

Let's continue using our application training example. In this case, we'd want to measure the historical levels of satisfaction with the events from the past three years or so, as well as any information possible in regards to the independent variables.

Table 3.1: Auto MPG and Price

	(1)	(2)
mpg	-238.90***	-49.51
	(53.08)	(86.16)
weight		1.75***
		(0.641)
constant	11,253***	1,946
	(1,171)	(3,597)
obs	74	74
R^2	0.220	0.293

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

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.

- Routing and resource discovery;
  - Language Models
  - Vector Space Models
- Resilient and scalable computer networks;
- Distributed storage and search.

Bibliography

Chen, Jia, Jiajun Jiang, and Yu jane Liu, "Financial Literacy and Gender Difference in Loan Performance," *Journal of Empirical Finance*, 2018, *48* (71673007), 307–320.

Einav, Liran and Amy Finkelstein Mark R. Cullen, "Estimating Welfare in Insurance Markets Using Variation in Prices," *Quarterly Journal of Economics*, 2010, *CXXV* (August), 877–921.

Havrylchyk, Olena and Marianne Verdier, "The Financial Intermediation Role of the P2P Lending Platforms," *Comparative Economic Studies*, 2018, *60* (1), 115–130.

Appendix Mathematical Tools

This appendix covers some of the basic mathematics used in econometrics. We briefly discuss the properties of summation operators, study the properties of linear and some nonlinear equations, and review the ratios and percentages. We also introduce some special functions that are common in econometrics applications, including quadratic functions and natural logarithms. The first four sections require only basic algebraic techniques. The fifth section briefly reviews differential Calculus Although Calculus is not necessary to understand much of this book, it is used in some of the end-of-chapter appendices and in some of the more advanced topics in part 3.

A.1 Summation Operator and Description Statistics

Summation Operator is an abbreviation used to express the summation of numbers, it plays an important role in statistics and econometrics analysis. If $\{x_i : i = 1, 2, \ldots, n\}$ is a sequence of n numbers, the summation of the n numbers is：

$$\sum_{i=1}^{n} x_i \equiv x_1 + x_2 + \cdots + x_n \tag{A.1}$$

Appendix A Minimal Example

```
\documentclass{elegantbook}
% title info
\title{Title}
\subtitle{Subtitle is here}
% bio info
\author{Your Name}
\institute{XXX University}
\date{\today}
% extra info
\version{1.00}
\equote{Victory won\rq t come to us unless we go to it.
    --- M. Moore}
\logo{logo.png}
\cover{cover.jpg}


\begin{document}


\maketitle
\tableofcontents
\mainmatter
\hypersetup{pageanchor=true}
% add preface chapter here if needed
\chapter{Example Chapter Title}
The content of chapter one.


\bibliography{reference}
\end{document}
```