An Elegant LaTeX Template for Books

Classic ElegantLaTeX Template

Author: Ethan Deng & Liam Huang

Institute: ElegantLaTeX Program

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Bio: Information

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

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Chapter 1 ElegantLaTeX Templates

ElegantLaTeX Program developers are intended to provide you beautiful, elegant, user-friendly templates. Currently, the ElegantLaTeX is composed of ElegantNote, ElegantBook, ElegantPaper, designed for typesetting notes, books, and working papers respectively. Latest releases are strongly recommended! This guide is aimed at briefly introducing the 101 of this template. For any other question, suggestion or comment, feel free to contact us on GitHub issues or email us at `elegantlatex2e@gmail.com`.

Contact Infos:

- GitHub: https://github.com/ElegantLaTeX/
- CTAN: https://ctan.org/pkg/elegantbook
- Download: release, latest version

1.1 Online Usage

You can visit Overleaf to use our template online anywhere and anytime without local installation. To find our template, search `elegantlatex` in the `templates` or simply visit search result, choose the template you prefer and `Open as Template` to own a copy yourself to edit freely. To learn more about Overleaf, please refer to Documentation.

1.2 Portable Version

For portable version, simply download lastest ElegantBook-master from GitHub or CTAN (to be more accurate, download `elegantbook.cls`) and save the file(s) under your working directory. This way of installation is simple and convenient, but you have to manually update `cls` now and then.

1.3 Update Templates

You can use cmd/terminal to update the tlmgr itself and all the packages, the commands are:

```
tlmgr update --self
tlmgr update --all
```

To learn more, please refer to How do I update my TeX distribution?

1.4 Other Release Versions

If you are a TeX Live 2018/2019/2020/2021 user and would like to update, the official solution is to uninstall the previous version. If you want to save the bother of uninstallation and re-installation, please copy `elegantbook.cls` to the installation directory of TeX Live 2022 (default: `C:\texlive\2022\texmf-dist\tex\latex\elegantbook`), run `texhash` in cmd.

Chapter 2 ElegantBook Settings

This template is based on the Standard LaTeX book class, so the options of book class work as well (Note that the option of papersize has no effect due to `device` option). The default encoding is UTF-8 while TeX Live is recommended. The test environment is Win10/Ubuntu 20.04/macOS + TeX Live 2022/ MacTeX 2022, either pdfLaTeX or XeLaTeX works fine.

2.1 Languages

We defined one option named `lang` which has two basic values, `lang=en` (default) , `lang=cn`. Different values will alter the captions of figure/table, abstract name, refname, etc. You can use this option as

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

Besides the two basic language translation, our user provide more options, here is a short brief introduction to these translation. Since I am not familiar with these languages, I can't guarantee that the translations are correct, please comment on GitHub if you have some questions.

- Italian translation `lang=it`, provided by VincentMVV , please refer to Italian translation;
- French translation `lang=fr`, provided by abfek66 , please refer to Italian translation;
- Dutch Translation `lang=nl`, provided by inktvis75 , please refer to Dutch Translation;
- Hungarian translation `lang=hu`, provided by palkotamas, please refer to Hungarian translation;
- Deutsch translation `lang=de`, provided by Lisa, please refer to Deutsch translation;
- Spanish translation `lang=es`, provided by Gustavo A. Corradi, please refer to Spanish translation;
- Mongolian translation `lang=mn`, provided by Altantsooj, please refer to Mongolian translation;
- Japanese translation `lang=jp`, provided by inusturbo, please refer to Japanese translation.

Remark Chinese Characters are acceptable **ONLY** in `lang=cn`.

2.2 Device Mode Option

The option for device (`device`) was originally used in ElegantNote, now we include this option in ElegantBook[1] as well. Activate iPad mode in the following way[2]:

```
\documentclass[pad]{elegantbook} %or
\documentclass[device=pad]{elegantbook}
```

2.3 Color Themes

This template contains 5 color themes, i.e. `green`[3], `cyan`, `blue`(default), `gray`, `black`. You can choose `green` with

[1] Pictures have to be modified accordingly.

[2] Default size: normal, A4 paper.

[3] Original default theme.

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

Table 2.1: ElegantBook Themes

	green	cyan	blue	gray	black	Main Environments
structure						chapter section subsection
main						definition exercise problem
second						theorem lemma corollary
third						proposition

If you want to customize the colors, please select `nocolor` or use `color=none` and declare the main, second, and third colors in the preamble section as follows:

```
\definecolor{structurecolor}{RGB}{60,113,183}
\definecolor{main}{RGB}{0,166,82}%
\definecolor{second}{RGB}{255,134,24}%
\definecolor{third}{RGB}{0,174,247}%
```

2.4 Cover

2.4.1 Customized Cover

From v3.10, customized cover is allowed, you can choose or hide any element as you prefer. Current optional elements are:

- title: `\title`
- subtitle: `\subtitle`
- author: `\author`
- institute: `\institute`
- date: `\date`
- version: `\version`
- extra information: `\extrainfo`
- cover image: `\cover`
- logo: `\logo`

Besides, an extra command `\bioinfo` is provided with two options–caption and content. For instance, if you want to display `Username: 111520`, just type in

```
\bioinfo{Username}{115520}
```

You can change the color of the horizontal bar of the cover by

```
\definecolor{customcolor}{RGB}{32,178,170}
\colorlet{coverlinecolor}{customcolor}
```

2.4.2 Cover Image

The cover image used in this template is from pixabay.com. The image is completely free and can be used under any circumstance. The cover image size is 1280×1024. If you would like to change the cover, please crop it according to the size of the cover picture strictly. One free online image clipping site: fotor.com. Feel free to join our QQ Group to get more elegant covers.

2.4.3 Logo

Aspect ratio of the logo is 1:1 in this guide, i.e. a square picture. To replace the logo, do remember to choose the appropriate picture.

2.4.4 Stylized Cover

Want to use stylized cover?(For instance, A4-sized PDF designed by Adobe Illustrator) Please comment out `\maketitle` and use `pdfpages` to insert the cover. Similar for using `titlepage`. If you would like to use the cover in version 2.x, please refer to etitlepage.

2.5 Chapter Title Display Styles

This template contains 2 sets of *title display styles*,`hang`(default) and `display` style. For the former, chapter title is displayed on a single line (`hang`). For the latter, chapter title is displayed on a double line (`display`).In this guide, we use `hang` . To change display style, use:

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

2.6 Introduction of Math Environments

We defined two sets of theorem modes, `simple` style and `fancy` style (default). You may change to `simple` mode by

```
\documentclass[simple]{elegantbook} %or
\documentclass[mode=simple]{elegantbook}
```

In this template, we defined four different theorem class environments

- *Theorem Environments*, including title and content, numbering corresponding to chapter. Three types depending on the format:
  - **definition** environment, the color is main;
  - **theorem, lemma, corollary, axiom, postulate** environment, the color is second;
  - **proposition** environment, the color is third.

- *Example Environment*, including **example, exercise, problem** environment, auto numbering according to chapter.
- *Proof Environment*, including **proof, note** environment containing introductory symbol (**note** environment) or ending symbol (**proof** environment).
- *Conclusion Environment*, including **conclusion, assumption, property, remark and solution**[4] environments, all of which begin with boldfaced words, with format consistent with normal paragraphs.

2.6.1 Theorem Class Environments

Since 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 text}
The content of theorem.
\end{theorem}
```

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

From version 4.1, you can write your theorem environments as follows:

```
\begin{theorem}[theorem name]\label{thm:label text}
  The content of theorem.
\end{theorem}
% or
\begin{theorem}
  The content of theorem.
\end{theorem}
```

Other theorem class environments with the same usage includes:

Table 2.2: Theorem Class Environments

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

2.6.2 Counter for Theorem Environments

You can use `thmcnt` option to control the theorem counter/number display style for the theorem environments, the acceptable options are `chapter` (default) and `section`.

[4] We also define an option `result`, which can hide the `solution` and `proof` environments. You can switch between `result=answer` and `result=noanswer`.

```
\documentclass[section]{elegantbook} % turn the Theorem 4.1 to Theorem 4.1.1
\documentclass[thmcnt=section]{elegantbook}
```

2.6.3 Other Customized Environments

The other three math environments can be called directly since there are no additional option for them, e.g. `example`:

```
\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 similar environments with slight differences lies in:

- Example, exercise, problem environments number within chapter;
- Note begins with introductory symbol and proof ends with ending symbol;
- Conclusion and other environments are normal paragraph environments with boldfaced introductory words.

2.7 List Environments

This template uses `tikz` to customize the list environments, with `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 Fonts

Alert After v3.10, newtx is reset to cm, together with other two options, the `math` font option offers:

1. `math`=`cm`(default), use LaTeX default math font (recommended).
2. `math`=`newtx`, use `newtxmath` math font (may bring about bugs).
3. `math`=`mtpro2`, use `mtpro2` package to set math font.

If you use `newtx` fonts, type in:

```
\documentclass[math=newtx]{elegantbook}
```

When you are using `newtx`, please pay attention to the hyphens. For instance,

$$\int_{R^q} f(x,y)dy.off \tag{2.1}$$

The corresponding code is:

```
\begin{equation}
  \int_{R^q} f(x,y) dy.\emph{of \kern0pt f}
\end{equation}
```

2.8.1 Symbol Fonts

Feedback from some 3.08 users claims that error occurs when using our templates with `yhmath`, `esvect` and other packages.

```
LaTeX Error:
Too many symbol fonts declared.
```

The reason is that the template redefines font for math so that no new math font is allowed to be added. To use `yhmath` and/or `esvect`, please locate `yhmath` or `esvect` in `elegantbook.cls`, uncomment corresponding related code.

```
%%% use yhmath pkg, uncomment following code
% \let\oldwidering\widering
% \let\widering\undefined
% \RequirePackage{yhmath}
% \let\widering\oldwidering

%%% use esvect pkg, uncomment following code
% \RequirePackage{esvect}
```

2.9 Bibliography

This template uses biblatex to generate the bibliography, the default citestyle and bibliography style are both `numeric`. Let's take a glance at the citation effect. [**en1**] use data from a major peer-to-peer lending [**en3**] marketplace in China to study whether female and male investors evaluate loan performance differently [**en2**].

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

To change the bibliography style, this version introduces two options: `citestyle` and `bibstyle`, please refer to CTAN:biblatex for more detail about these options. You can change your bibliography style as

```
\documentclass[citestyle=numeric-comp, bibstyle=authoryear]{elegantbook}
```

We also add the `bibend` option to this template, you can choose `biber` (default) or `bibtex` as you like, `biber` is recommended.

```
\documentclass[bibtex]{elegantbook} % or
\documentclass[bibend=bibtex]{elegantbook}
```

2.10 Preface

If you want to add a preface before the first chapter with the number of chapter unchanged, please add the preface in the following way:

```
\chapter*{Introduction}
\markboth{Introduction}{Introduction}
The content of introduction.
```

2.11 Content Option and Depth

Option for content `toc`, you can choose either one column(`onecol`) or two columns(`twocol`). For two columns:

```
\documentclass[twocol]{elegantbook}
\documentclass[toc=twocol]{elegantbook}
```

Default content depth is 1, use to use `\setcounter{tocdepth}{2}`.

2.12 Introduction Environment

We create a introduction environment to display the structure of chapter. The basic useage is as follows:

```
\begin{introduction}
  \item Definition of Theorem
  \item Ask for help
  \item Optimization Problem
  \item Property of Cauchy Series
  \item Angle of Corner
\end{introduction}
```

And you will get:

Introduction

- *Definition of Theorem*
- *Ask for help*
- *Optimization Problem*
- *Property of Cauchy Series*
- *Angle of Corner*

You can change the title of this environment by modifying the optional argument of this environment:

```
\begin{introduction}[Brief Introduction]
...
\end{introduction}
```

The environment `problemset` is used at the end of each chapter to display corresponding exercises. Just type in the following sentences:

```
\begin{problemset}
  \item exercise 1
```

```
  \item exercise 2
  \item exercise 3
\end{problemset}
```

And you will get:

Chapter 2 Exercise

1. exercise 1
2. exercise 2
3. exercise 3
4. math equation test:

$$a^2 + b^2 = c_{2_i}(1,2)[1,23] \tag{2.2}$$

Remark If you want to customize the title of `problemset`, please change the optional argument like in introduction environment. In this version the `problemset` environment automatically appears in the table of contents but not in the header or footer(to be fixed).

Solution *If you want to customize the title of `problemset`, please change the optional argument like in introduction environment. In this version the `problemset` environment automatically appears in the table of contents but not in the header or footer(to be fixed).*

2.13 Margin Notes

In 3.08, we introduced `marginpar=margintrue` and `\elegantpar` (Beta) with piles of bugs. Hence we decide to remove them in 3.09 and will suspend the options till revolutionary optimization. Sorry for all the bugs! However, we retain the option `marginpar` for users to get margin motes by activating `marginpar=margintrue` and using `\marginpar` or `marginnote` packages.

Remark Note that text and equation are both available in the margin notes.

```
% text
\marginpar{margin paragraph text}

% equation
\marginpar{
\begin{equation}
  a^2 + b^2 = c^2
\end{equation}
}
```

For tables and figures, note that floating environment is not allowed. You have to use `includegraphics` or `table` and use `\captionof` to name it. To get centralized figures or tables, use `\centerline` or `center`. To learn more, please refer to Caption of Figure in Marginpar.

```
% graph with centerline command
\marginpar{
  \centerline{
    \includegraphics[width=0.2\textwidth]{logo.png}
  }
```

```
  \captionof{figure}{your figure caption}
}

% graph with center environment
\marginpar{
  \begin{center}
    \includegraphics[width=0.2\textwidth]{logo.png}
    \captionof{figure}{your figure caption}
  \end{center}
}
```

Chapter 3 ElegantBook Writing Sample

Introduction

- *Theorem Class Envrionments*
- *Cross Reference*
- *Math Environments*
- *List Environments*
- *Logo and Base*
- $a^2+b^2=c^2$

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 non-negative 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 $Hx = \{hx : h \in H\}\hbar$*

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.

As theorem 3.1 refered.

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.

Theorem 3.2 (theorem name)

The content of theorem. ♡

we can refer this theorem as 3.2.

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. ♠

Proof Let z be some element of $xH \cap yH$. Then $z = xa$ for some $a \in H$, and $z = yb$ for some $b \in H$. If h is any element of H then $ah \in H$ and $a^{-1}h \in H$, since H is a subgroup of G. But $zh = x(ah)$ and $xh = z(a^{-1}h)$ for all $h \in H$. Therefore $zH \subset xH$ and $xH \subset zH$, and thus $xH = zH$. Similarly $yH = zH$, and thus $xH = yH$, as required.

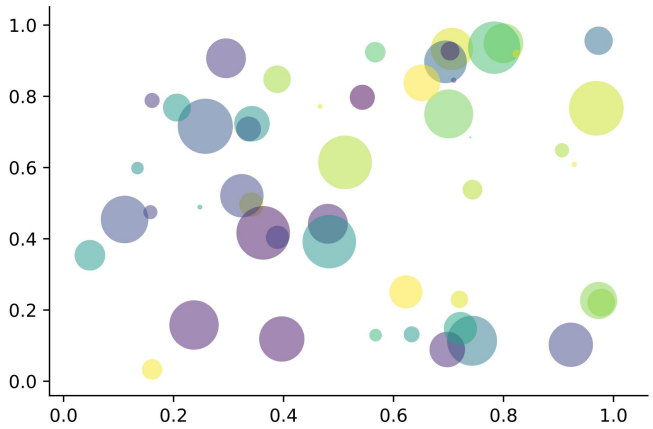

Figure 3.1: Matplotlib: Scatter Plot Example

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.

3.2 Second section

This second section may include some special word, and expand the ones already used.

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

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

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.

Chapter 3 Exercise

1. Solve the equation $5(-3x-2)-(x-3)=-4(4x+5)+13$.
2. Find the distance between the points $(-4,-5)$ and $(-1,-1)$.
3. Find the slope of the line $5x-5y=7$.

Chapter 4 FAQ

We list some FAQs for users to refer to:

1. *Why option numbers for natbib fail to take effect in v3.07?*

   In v3.07, when `gbt7714` is introduced, option `authoryear` is incompatible with `natbib`. In v3.08 and 3.09, `numbers`, `numbers`, `super` and `authoryear` are introduced.

2. *I want to customize font and background color.*

   Please use `pagecolor` to change background color, refer to this to customize font.

3. *Which version should I choose?*

   Please use Latest Release via GitHub or TeX Live 2022.

4. *Which editor should I choose?*

   You can use TeX Live 2022 built-in TeXworks or TeXStudio. You may refer to TeXworks autocomplete. TeX Live 2022 + TeXstudio is strongly recommended. Related configurations can be found at vscode-latex and sublime-text-latex.

5. *Hello, we want to use ElegantBook to write a book about machine learning and would like your authorization.*

   Feel free to use our templates by pointing out our copyright. For other issues, please refer to LPPL-1.3c. If you want to show us your work, you can share the URL with us afterwards.

6. *What is cross reference?*

   This template is aimed at who are not a complete beginner for LaTeX. Please learn more about LaTeX before using this template.

7. *Is the language for code highlighting optional?*

   Yes, `listings` package is used in ElegantBook, hence language is optional(e.g. `language=Python`). For global setting, use `lstset`. For more information, please refer to package documentations.

8. *When will Beamer template (ElegantSlide or ElegantBeamer) forthcoming?*

   Since there is an excellent theme Metropolis, no plan for Beamer theme.

Chapter 5 Version History

We revised our templates now and then. This section shows the version story of ElegantBook.

2022/04/09 *Updates:release of v4.3.*

① Remove part newtx settings, set TeX Gyre Terms/Heros fonts under XeLaTeX.
② Fix Chinese fonts in the theorem environments.
③ Add theorem counter option, `thmcnt=section`.
④ Add bib option `bibend`, which can take value of biber and bibtex.
⑤ **! Warnings**: The multilingual option may cause some unexpected errors, you can report in this issue.

2022/03/08 *Updates:release of v4.2.*

① Bug fix due to the update of newtx fonts;
② Add 'Chapter' in TOC, and redefine `\chaptername` to unify the logic under different languages;
③ Add language option for Japanese, `lang=jp`.

2021/05/02 *Updates:release of v4.1.*

① **! Big Change**: Change the bibliography method from BibTeX to biblatex(with backend `biber`);
② **! Big Change**: Add support for the default theorem writing method (with optional name and label);
③ Add left and right space;
④ Support hyperlink from the text of TOC;
⑤ Remove the pdfLaTeX compatiblity check for Chinese.
⑥ Add multilingual support, for french `lang=fr`, dutch `lang=nl`, Hungarian `lang=hu`, Spanish `lang=es`, Mongolian `lang=mn` etc.

2020/04/12 *Updates:release of v3.11,* ***LAST*** *version of 3.x.*

① **! Fix**: Fix `natbib option clash` problems caused by `gbt7714` updates.
② Remove `base` decorations and its options since `pgfornament` package is not included in TeX Live 2020.
③ Fix spacing problem in some environments.
④ Introduce language option for Italian, `lang=it`.

2020/02/10 *Updates:release of v3.10*

① Introduce `math` for math font, optional styles are `newtx` and `cm`.
Notice: The math font `newtxmath` in previous versions is reset to default LaTeX math font, to keep previous math font, please declare `math=newtx`.
② Introduce `chinesefont` option, with `founder`, `ctexfont` and `nofont` available.
③ Turn author information on the cover optional and add customized command `\bioinfo`.
④ Add version history with command `\datechange` and environment `change`.
⑤ Add Chinese chapter style `scheme` with option `chinese`.
⑥ Since the bug raised by `\lvert` is fixed, exchange package positions of `ctex` and `amsmath`.
⑦ Drop `\lastpage` from header to avoid page anchor bug and adding `\frontmatter`.
⑧ Revise bibliography option `cite` with optional styles `numbers`,`authoryear` and `super`.

⑨ Introduce bibliography style option `bibstyle`, with default bib style `apalike` for English mode and `gbt7714` package for Chinese mode.

2019/08/18 *Updates:release of v3.09*

① Remove `\elegantpar` temporary and remind users to use `\marginnote` and `\marginpar` instead.
② Use `esint` to display integral operator.
③ Add new command `toc`, with options `onecol` and `twocol`.
④ Add new option `cite` `super` for superscript-displayed citation.
⑤ Revise `problemset`.

Appendix A 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:

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