

spTitle Document

Sweet Pastry

2025-04-10

Contents

Preface	iii
1 How to Use spBook?	1
1.1 Preamble	1
1.2 Options	2
1.3 Command	2
1.4 Document	3
2 Math Environment	5
2.1 Math Writing Support	5
2.2 tikz and tikz-cd	5
2.3 Math Statement Index	7
List of Figures	11
List of Tables	11
Statement Index	15
Bibliography	17

Preface

As a \LaTeX beginner, I often struggled to understand the meanings behind its complex commands and to clearly distinguish between concepts such as *macros* and *commands*. The typographical programming nature of \LaTeX significantly differs from traditional logic-based programming languages, which added to the learning curve.

My introduction to \LaTeX occurred during my first year at university. At that time, I was completely unfamiliar with human-computer interaction, as my pre-university education strictly prohibited the use of electronic devices—such usage was considered either cheating or a violation of school rules. As a physics student, I frequently encountered extensive mathematical calculations involving abstract Greek letters and various symbolic notations. When it came to submitting homework or laboratory reports, handwritten drafts often posed several challenges: they were difficult for teaching assistants to read and grade, and they created an impression of being either disrespectful or lacking proficiency in modern computational tools.

Driven by necessity, I began learning \LaTeX . After over a year of practice and exploration, I decided to consolidate my knowledge and experiences into a collection of templates designed to simplify the creation of \LaTeX documents. My goal was to minimize the complexity of the main document source file and to provide a reusable, easy-to-understand solution for users facing similar challenges. These templates are now publicly available on [GitHub](#), along with detailed documentation to assist potential users. The target audience includes those who, like myself, are new to \LaTeX but require its capabilities for academic or professional purposes.

It is my sincere hope that these templates and accompanying instructions can help others overcome the steep initial learning curve of \LaTeX and enable them to produce polished, professional documents efficiently.

This open-source repository is licensed under **CC BY 4.0**. Users are free to use, modify, distribute, and commercially exploit the content, provided [proper attribution](#) is given.

Sweet Pastry

Fudan University

Chapter 1

How to Use spBook?

1.1 Preamble

The `spBook` class encapsulates most of the configurations for book typography, including PDF `hyperref` setup and various other features. This means that unless you wish to add new functionality or modify existing features, there is no need to write redundant `LATEX` code in your preamble. Simply follow the provided structure.

This template also defines several new commands to pass information to private macros within `spBook`. These macros are used to customize and individualize your PDF, such as setting the author name.

```
\documentclass[
  ref = <bib File>
  bibstyle = <bib Style>,
  lang = <en/cn>,
  coverpage = <PDF/.tex>,
  geometry = <a4/b5>,
  nocite = <true/false>,
  colorlinks = <true/false>
]{spBook}

\spTitle{<Your PDF Title>}
\spAuthor{<Your PDF Author>}
\spDate{<default \today>}

\begin{document}
  \frontmatter
  % """"
  % here is preface part, for example:
  \spChapter[<Title for display>]{%
    <Title for content table and page header>}
```



```

        \lipsum[1-5]
% ""

\mainmatter
% ""
% here is main text part, for example:
\spChapter[Experiment Principle]{Experiment Principle}
    \lipsum[5-10]
\spChapter[Conclusion]{Conclusion}
    \lipsum[5-10]
% ""
\end{document}

```

1.2 Options

In this section, I will provide a detailed explanation of each option and its functionality.

1. **ref**: A string macro that specifies the name of your bibliography file. If your essay includes references, you must assign your `.bib` file name to **ref**. For example, use `ref=myRef` or `ref=myRef.bib`. The default value is **ref**.
2. **bibstyle**: A string macro that allows you to specify the desired bibliography style. For instance, you can set `bibstyle=apa`. The default value is **ieee** for English documents (`lang=en`) and **gb7714-2015** for Chinese documents (`lang=cn`).
3. **lang**: A string macro that specifies the document language. The options are **en** (English) and **cn** (Chinese), with the default being **en**.
4. **coverpage**: A string macro that allows you to include a custom cover page, either as a PDF or a `.tex` file. The specified cover page will be added at the beginning of the final PDF.
5. **nocite**: A boolean macro that determines whether all entries in the `.bib` file are included in the bibliography, regardless of citation. The default value is **true**, meaning all entries will be printed even if they are not cited. If you use a large `.bib` file as a general citation library, you may wish to set this to **false**.
6. **colorlinks**: A boolean macro that specifies whether hyperlinks in the final PDF should be colorful. The default value is **true**. If you prefer plain hyperlinks, set this to **false**.

1.3 Command

The `spBook` class introduces several enhanced commands for specifying key information, enabling more streamlined and efficient document customization.

1. `\spTitle{}`: Functions similarly to `\title{}` and is used in the same manner.
2. `\spAuthor{}`: Functions similarly to `\author{}` and is used in the same manner.
3. `\spDate{}`: Functions similarly to `\date{}` and is used in the same manner.
4. `\spChapter[]`: This command provides enhanced customization for chapter titles. The required parameter specifies the text used for the table of contents and the page header, while the optional parameter customizes the chapter title displayed at the start of the chapter. For instance, `\spChapter[Your Title]{your title}` will display *Your Title* at the beginning of the chapter, while *your title* will appear in the table of contents and the page header. It is important to note the difference between `\spChapter{your title}` and `\spChapter[]your title`. In the first case, the required parameter (*your title*) is automatically used as the value for the optional parameter. In contrast, the second usage explicitly passes an empty string to the optional parameter, leaving the chapter title at the start of the chapter blank or stylized as per additional customization.

1.4 Document

To allow users full control over the typographical logic of their document, essential commands for mode switching have not been all encapsulated. Users are expected to invoke these commands manually as needed.

1. `\frontmatter`: In the original L^AT_EX, this command serves as a global compilation flow control mechanism but takes effect at a later stage. As a result, it may not be considered suitable for encapsulation. However, `spBook` has encapsulated several other essential yet manually invoked commands, such as `\maketitle` and `\tableofcontents`, into `\frontmatter`. In other words, once the user declares `\frontmatter` to switch the book stage to the preface section, the book title and table of contents will be generated automatically.
2. `\mainmatter`: Users are expected to manually use this commands to explicitly enter the main text state.

Chapter 2

Math Environment

2.1 Math Writing Support

`spBook` load some essential math macro packages to support math writting, even some complex formula.

$$\begin{aligned} \Gamma_{n\mathbf{Q}}^{\text{ex-ph}}(T) = & \frac{2\pi}{\hbar} \frac{1}{N_{\mathbf{q}}} \sum_{m\nu\mathbf{q}} |\mathcal{G}_{nm\nu}(\mathbf{Q}, \mathbf{q})|^2 \left[(N_{\nu\mathbf{q}} + 1 + F_{m\mathbf{Q}+\mathbf{q}}) \times \delta \left(E_{n\mathbf{Q}} - E'_{m\mathbf{Q}+\mathbf{q}} - \hbar\omega_{\nu\mathbf{q}} \right) \right. \\ & \left. + (N_{\nu\mathbf{q}} - F_{m\mathbf{Q}+\mathbf{q}}) \times \delta \left(E_{n\mathbf{Q}} - E'_{m\mathbf{Q}+\mathbf{q}} + \hbar\omega_{\nu\mathbf{q}} \right) \right] \end{aligned} \quad (2.1)$$

2.2 `tikz` and `tikz-cd`

The `spArticle` class automatically loads the `tikz` package, allowing you to create diagrams and figures directly without any additional configuration.¹

¹This figure's origin code is copy from [mathcha](#).

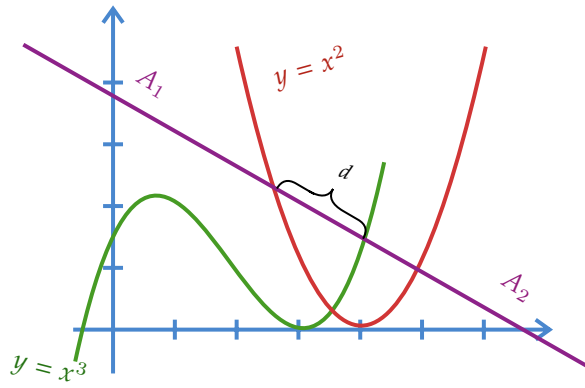


Figure 2.1: tikz draw graph example

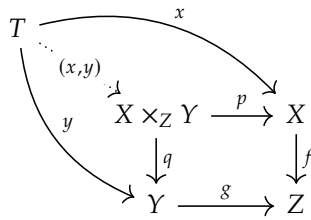


Figure 2.2: commutative diagram demo1

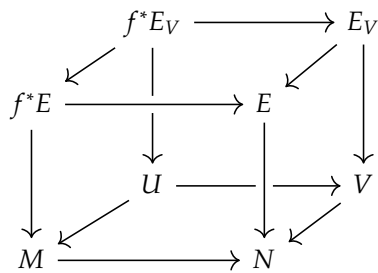


Figure 2.3: commutative diagram demo2

2.3 Math Statement Index

`spBook` has set a function that automatically add index table of math statement like *definition*, *theorem* or *example* and so on.

For example:

Definition 2.3.1 (Named Definition) Here is definition environment. With the name of this definition, it will be automatically written into index appendix.

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. 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.

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 2.3.1 (Cauchy's Integral Formula) Let $f(z)$ be holomorphic in a simply connected domain Ω and let C be a simple closed contour within Ω , enclosing a point $a \in \Omega$. Then, for all z inside C ,

$$f(a) = \frac{1}{2\pi i} \oint_C \frac{f(z)}{z - a} dz.$$

This is Cauchy intergral Formula.

Proof Since $f(z)$ is holomorphic in Ω , we can define the function

$$g(z) = \frac{f(z)}{z - a}.$$

Because $f(z)$ is analytic in Ω and C is a simple closed contour enclosing a , we can apply Cauchy's Residue Theorem. The function $g(z)$ has a simple pole at $z = a$ with residue

$$\text{Res}(g, a) = f(a).$$

By the Residue Theorem, we get:

$$\oint_C g(z) dz = 2\pi i \text{Res}(g, a) = 2\pi i f(a).$$

Therefore, we conclude that:

$$f(a) = \frac{1}{2\pi i} \oint_C \frac{f(z)}{z - a} dz.$$

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.

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.

Nulla in ipsum. Praesent eros nulla, congue vitae, euismod ut, commodo a, wisi. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Aenean nonummy magna non leo. Sed felis erat, ullamcorper in, dictum non, ultricies ut, lectus. Proin vel arcu a odio lobortis euismod. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Proin ut est. Aliquam odio. Pellentesque massa turpis, cursus eu, euismod nec, tempor congue, nulla. Duis

viverra gravida mauris. Cras tincidunt. Curabitur eros ligula, varius ut, pulvinar in, cursus faucibus, augue.

Nulla mattis luctus nulla. Duis commodo velit at leo. Aliquam vulputate magna et leo. Nam vestibulum ullamcorper leo. Vestibulum condimentum rutrum mauris. Donec id mauris. Morbi molestie justo et pede. Vivamus eget turpis sed nisl cursus tempor. Curabitur mollis sapien condimentum nunc. In wisi nisl, malesuada at, dignissim sit amet, lobortis in, odio. Aenean consequat arcu a ante. Pellentesque porta elit sit amet orci. Etiam at turpis nec elit ultricies imperdiet. Nulla facilisi. In hac habitasse platea dictumst. Suspendisse viverra aliquam risus. Nullam pede justo, molestie nonummy, scelerisque eu, facilisis vel, arcu.

List of Figures

2.1	tikz draw graph example	6
2.2	commutative diagram demo1	6
2.3	commutative diagram demo2	6

List of Tables

Statement Index

C

Cauchy's Integral Formula, [7](#)

N

Named Definition, [7](#)

Bibliography

- [1] L. Lamport, *LaTeX: A Document Preparation System*, 2nd. Boston, MA: Addison-Wesley, 1994, An excellent introduction to LaTeX., ISBN: 978-0201529838. [Online]. Available: <https://latex-project.org/>.
- [2] A. Einstein, “Zur elektrodynamik bewegter körper,” *Annalen der Physik*, vol. 322, no. 10, pp. 891–921, 1905, This paper introduces the theory of special relativity. DOI: [10.1002/andp.19053221004](https://doi.org/10.1002/andp.19053221004).
- [3] D. E. Knuth, *Knuth: Computers and typesetting*, <http://www-cs-faculty.stanford.edu/~knuth/>, Accessed: 2025-01-01.
- [4] A. M. Turing, “On computable numbers, with an application to the entscheidungsproblem,” in *Proceedings of the London Mathematical Society*, A landmark paper in computer science., vol. s2-42, 1936, pp. 230–265. DOI: [10.1112/plms/s2-42.1.230](https://doi.org/10.1112/plms/s2-42.1.230).