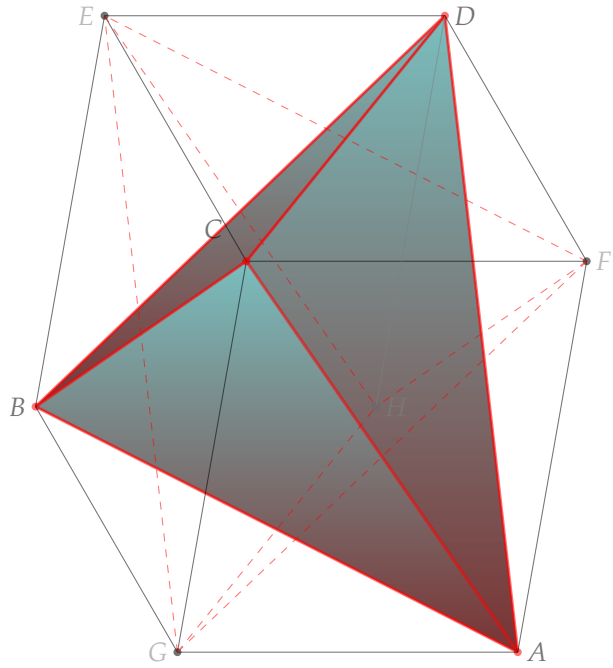
spBook

DEMO

Sweet Pastry

Coverpage code **heavily** based on Li Wen-wei and Axel Pavillet



`spTitle` Document

Sweet Pastry

2025-05-18

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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.

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 LaTeXcode 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 LaTeX, 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.

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

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]

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

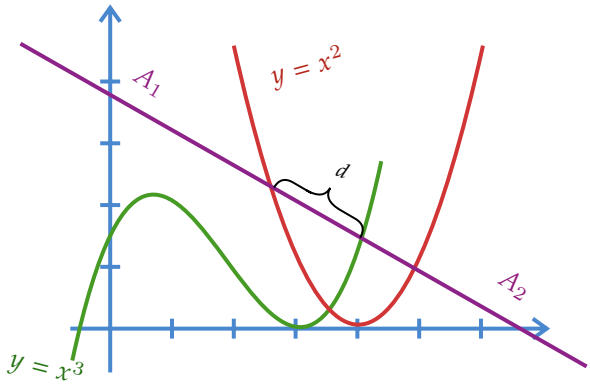

Figure 2.1: tikz draw graph example

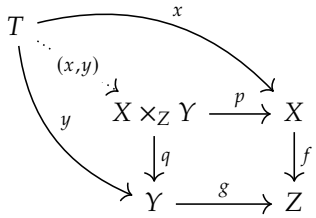

Figure 2.2: commutative diagram demo1

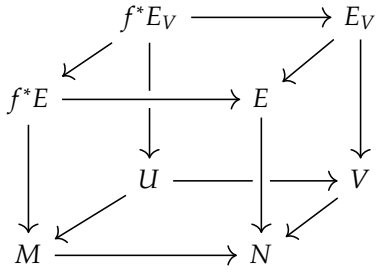

Figure 2.3: commutative diagram demo2

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.

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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

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

By the Residue Theorem, we get:

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

Therefore, we conclude that:

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

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Bibliography

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