

# The LiteSolution Template

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This is the document for LiteSolution template, which provides a lite design of the solution of test paper.

Some designs of this template currently only support **Simplified Chinese (Mainland)**. If necessary, you can change some Chinese characters to the language you want in the \*.cls file.

## 1. Introduction

### 1.1 The purpose of this template

This template provides a lite and fresh template, and mainly used for typesetting solutions of mid-term or final exam, textbooks and other exercises. This template is developed based on ElegantBook and VividBook, ported and improved the chapter design module code of The Legrand Orange Book. I'd like to express my gratitude to the template authors above for their previous work.

If you meet bugs when using this template, or you have better suggestions or ideas, or you want to participate in the development of the template or other templates by me, welcome to contact via email [xiamyphys@gmail.com](mailto:xiamyphys@gmail.com).

Also, you can join my  $\text{\LaTeX}$  Template Discussion QQ Group: 760570712 to communicate with me and get the insider preview edition of the template.

### 1.2 Loading LiteSolution and its modes

You should update all the packages to the latest version or switch to portable version instead by implementing the commands

```
tlmgr update --self --all --reinstall-forcibly-removed
```

To learn more, please refer to [How do I update my TEX distribution?](#)

Save the file litesolution.cls to your project's root directory, and then create a .tex file, just input the command `\documentclass{litesolution}` on the first line.

The template provides 3 modes, [answer](#), [mtpro2](#) and [counter](#). Just add the options of the modes you want separately in the square bracket of the command `\documentclass[options]{litesolution}` in your .tex file.

## 2. Modes of LiteSolution

### 2.1 The answer mode

This mode has two options, `ans` and `noans`, which can show and hide answers respectively. After you choose the `noans`, the contents in the environment `solution`, the command `ans` and the answers in the multiple choice questions will all disappear. So the area that originally contained the answer will be replaced by an area of the same blank size. You can generate exams without answers and solutions by enabling `noans`.

### 2.2 The mtpro2 mode

If you've installed the Mathtime Pro 2 Lite font in your computer, then you can use this mode to change the math font.

### 2.3 The counter

This mode has two options, `separate` and `continuous`, which can make the page counter between chapters be remaked or continuous. The page numbers between each test question will be continuous when you use the `continuous` mode or the page number of each test question will start from 1 when you use the `separate`.

## 3. Commands of LiteSolution

### 3.1 The chapterimage command

```
\chapterimage{cover1.png}
```

This command can assign the title background image for each subsequent chapter.

### 3.2 The chapterfont command

```
\chapterfont{PingFang HK} \chapterfont*{PingFang HK}
```

This command can assign the title font for each subsequent chapter, if you do not use this command, the title font will be songti in Chinese and Libertinus in English.

If a star (\*) is added after the `\chapterfont`, then  $\TeX$ Live will call the font file from the current path, note from the system. And the file in the current path only support the `.ttf` format.

### 3.3 The ans command

This command can underlines the answer and changes the color of the answer to Blue Sapphire.

If mode `noans` is enabled, the answer will disappear, leaving only a horizontal line the same width as the answer.

### 3.4 The solute command

```
\solute{3} % create a solution box with the height of 3em.
```

This command can create a fixable solution box when the mode `noans` is enabled.

### 3.5 The watermark command

```
\watermark{ctanlion.pdf}
```

This command can add watermark to the document.

### 3.6 Other customer commands

In order to facilitate input, the following commands are scheduled. You can add others in the \*.cls file as you like.

Command	Output	Command	Output	Command	Output
<code>\titlelogo{#1}{#2}</code>	Add emoji with link in text	<code>\point{#1}</code>	Add score	<code>\i</code>	i
<code>\sokka{#1}</code>	故本题选择 #1 项	<code>\d</code>	d	<code>\e</code>	e
<code>\xSim{#1}{#2}</code>	$\frac{r_2+r_1}{r_1 \times 2}$	<code>\num{e#1}</code>	$10^{-34}$	<code>\mat{#1}^{\sim T}</code>	$\mathbf{A}^T$
<code>\rank{#1}</code>	$R(\mathbf{AB})$	<code>\QED</code>	Q.E.D.	<code>\$5\unit{kg}\$</code>	5kg

## 4. Environments of LiteSolution

### 4.1 The choice environment

There're two variables in this environment. The first one is the answer of the choice problem, the second one is the keywords of this choice problem and it's optional.

```
\begin{choice}{D}[Keywords]
```

If you want to add choice and keywords.

```
\begin{tasks}(2) % 2 choices per line
```

```
\task This is choice A \task This is
choice B
```

```
\task This is choice C \task This is
choice D
```

```
\end{tasks}
```

```
\end{choice}
```

题目 1

Keywords

[ D ]

If you want to add choice and keywords.

A. This is choice A

B. This is choice B

C. This is choice C

D. This is choice D

题目 2

Gaussian theory

[ D ]

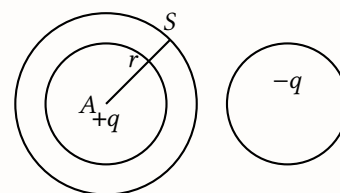
A 和 B 为两个均匀带电球体，A 带电荷  $+q$ ，B 带电荷  $-q$ ，作一与 A...

A. 通过 S 面的电场强度...

B. 通过 S 面的电场强度...

C. 通过 S 面的电场强度...

D. 通过 S 面的电场强度...



```
\begin{paracol}{2}
```

```
\begin{choice}{D}[Gaussian theory]
```

```
$A$和$B$为两个均匀带电球体，$A$带电荷$+q$，$B$带电荷$-q$，作一与$A$...
```

```
\begin{tasks}(2)
```

```
\task 通过$S$面的电场强度...
```

```
\task 通过$S$面的电场强度...
```

```
\task 通过$S$面的电场强度...
```

```
\task 通过$S$面的电场强度...
```

```
\end{tasks}
```

```
\end{choice}
```

```
\switchcolumn\centering\vfill\tikz{...}\vfill
```

```
\end{paracol}
```

## 4.2 The problem environment

Slightly different from the cmdchoice environment: the two variables are points and keywords, and the question number counter is shared with the multiple-choice question number counter.

```
\begin{problem}[Keywords][5]
    If you want to add keywords and points.
\end{problem}
\begin{problem}
    If you want to add none.
\end{problem}
\begin{problem}[Keywords]
    If you want to add keywords only.
\end{problem}
\begin{problem}[5]
    If you want to add points only.
\end{problem}
```

### 题目 3 (本题 5 分)

Keywords

If you want to add keywords and points.

### 题目 4

If you want to add none.

### 题目 5

Keywords

If you want to add keywords only.

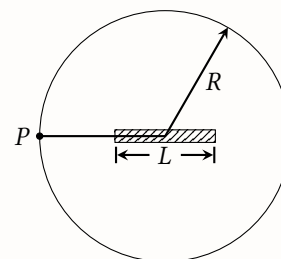
### 题目 6 (本题 5 分)

If you want to add points only.

### 题目 7 (本题 6 分)

Gaussian theory &amp; Field strength

一均匀带电直导线长为  $d$ , 电荷线密度为  $+\lambda$ . 过导线中点  $O$  作一半径为  $R$  ( $R > \frac{d}{2}$ ) 的球面  $S$ ,  $P$  为带电直导线的延长线与球面  $S$  的交点. 则通过该球面的电场强度通量  $\Phi_e = \frac{\lambda d}{\epsilon_0}$ , 带电直线的延长线与球面交点  $P$  处的电场强度的大小为  $\frac{\lambda d}{4\pi\epsilon_0(R^2 - d^2/4)}$ , 方向沿矢径  $\overrightarrow{OP}$ .



```
\begin{paracol}{2}
    \begin{problem}[Gaussian theory \& Field strength][6]
        一均匀带电直导线长为$d$, 电荷线密度为$+\lambda$, 过导线中点$O$...
        场强大小\ans{\frac{\lambda d}{4\pi\epsilon_0(R^2-d^2/4)}}$...
    \end{problem}
\switchcolumn\centering\vfill\tikz{...}\vfill
\end{paracol}
```

## 4.3 The note environment

```
\begin{note}
    Please note that...
\end{note}
```

### 注意

Please note that...

## 4.4 The proof environment

```
\begin{proof}
  Due to \emph{Langrange's Theorem}...
\end{proof}
```

证明. Due to Langrange's Theorem... Q.E.D.

If a star (\*) is added after the `\begin{solution}`, then the content will follow the

```
\begin{proof}*
  Due to \emph{Langrange's Theorem}...
\end{proof}
```

证明. Due to Langrange's Theorem...

## 4.5 The solution environment

```
\begin{solution}
  This is the answer for the problem.
\end{solution}
```

☒ 分析与解

This is the answer for the problem.

If a star (\*) is added after the `\begin{solution}`, then the content will follow the

```
\begin{solution}*
  This is the answer for the problem.
\end{solution}
```

☒ 分析与解 This is the answer for the problem.

If mode `noans` is enabled, the solution will disappear, leaving only a blank box with the same height as the solution, and the name of the box will change to [答题区域](#).

## 5. Known Issues

Sometimes  $\text{\TeX}$ Live will return errors when you enable the mode `noans` and use the `solution` environment in `paracol` environment.

## 6. Version History

This template is used to type the mid-term and final exam solutions of College Physics. Initially, I used the **ElegantBook** template for layout, however, it's no longer be maintained since January 1st, 2023, so I turn to use the **VividBook** instead. But this template is too bloated and some functions & designs need to be redesigned, so I started developing **LiteSolution**.

### Update Announcements

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2023/07/06 Update: Version 0.1b

- Support page number remaking between chapters.
- Added **watermark** command.

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2023/11/15 Update: Version 1.0a

- Redesigned the **chapterimage** part, include the layout and the code.
- Redesigned the **choice** and **solution** environment, keywords become optional and supports star (\*) key.
- Replaced the **exercise** environment with the **problem** environment, supports adding only keywords or points.
- Added the **note** environment and some customer commands.

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2023/12/13 Update: Version 1.2a

- Fixed the bug that the gap around the chapter image.
- Added some commands for matrices.
- Redesigned the **chapterfont** command.
- Redesigned the **proof** environment.
- Supports to adjust the height of solution box when output the exam paper without answer.
- Fixed the bug that warnings of the packages **xeCJK** and **fontspec**.

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2024/03/08 Update: Version 1.3a

- Added the mode **tcolorbox**, which you can choose whether the tcolorbox breakable or not.
- This version separate the chapterimage part to a single **titleimage.sty** file, which will be posted on **ctan.org** soon to make this template more maintainable.

### Future Plans

- Plan to add the **dark** mode to this template to make the text color light while make the page color dark to protect eyesight.
- Plan to change the \*.cls file to a block code design to make it easier for subsequent developers to maintain or modify.
- .....