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1. 如何在LaTeX中使用 无序 有序 内嵌的list
2. 如何使用自定义的起始符号

# LaTeX list - Enumerate and Itemize

Learn how to use the `enumerate` and `itemize` environments to add ordered, unordered and nested lists to your document.

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1. Unordered lists
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Using lists in LaTeX is pretty straightforward and doesn't require you to add any additional packages. For **unordered lists**, LaTeX provides the **`itemize` environment** and for **ordered lists** there is the **`enumerate` environment**. The elements within both environments have to be declared beginning with the **`\item` command**. The following code examples show how to use the most common types of lists you're going to use in your document.

## Unordered lists

As I've mentioned above, **unordered lists use the `itemize` environment and works without any additional packages:**

```
\begin{itemize}
  \item One
  \item Two
  \item Three
\end{itemize}
```

既然是一个环境变量，那么一定得使用 `begin` 以及 `end`

需要使用 `itemize` 环境变量 以及 不需要导入 任何额外的包

This will generate the following output:

### 1 Unordered lists

- One
- Two
- Three

## Ordered lists

If you want to add an ordered list, you simply have to replace *itemize* with *enumerated* environment and LaTeX will take care of the enumeration for you:

```
\begin{enumerate}
  \item One
  \item Two
  \item Three
\end{enumerate}
```

As you can see, LaTeX will automatically get the numbers right:

## 2 Ordered lists

1. One
2. Two
3. Three

## Nested lists

就是 list 中再嵌套list

Sometimes you also have to list things, which have some kind of sub-category. For this reason, LaTeX allows you to nest list environments and it will fix the indentation and numbering accordingly.

```
\begin{enumerate}
  \item One
  \begin{enumerate}
    \item Two
    \item Three
    \item Four
  \end{enumerate}
  \item Five
  \item Six
\end{enumerate}
```

The output will be formatted like this:

## 3 Nested lists

1. One
  - (a) Two
  - (b) Three
  - (c) Four
2. Five
3. Six

## Changing the numbering / bullets

就是自定义list前面的编号 或者 无序的序号

Sometimes it's necessary to change the numbering scheme of a list, e.g. you want to use a different symbol and so forth. You can easily modify the output of the list.

# Unordered lists

You can make the following changes easily **without loading a package**:

```
%From bullet to dash
\item[--] or \item[$-]

% From bullet to asterisk
\item[$\ast$]

%Use any math character
\item[$\CHARACTER$]
```

A full working code could look like this:

```
\begin{itemize}
  \item[--] Dash
  \item[\$-\$] Dash
  \item[\$\ast\$] Asterisk
\end{itemize}
```

And the output will look as follows:

## 4 Change bullet

- Dash
- Dash
- \* Asterisk

If you want to change the symbol for all items of the list, you should preferably use the **enumitem environment**, which I will explain using the example of ordered lists.

# Ordered lists

Changing this environment is a little more tricky, because there's a lot more logic involved and the easiest solution is probably using the *enumerate* or *enumitem* environments. I will use the *enumerate* environment for this purpose. So I will first add this environment to my preamble:

```
\documentclass{article}

% ...

\usepackage{enumitem}

\begin{document}
```

We can now use the following options on the *enumerate* environment:

```
%Roman numbers
\begin{enumerate}[label=(\roman*)]
%...

% Arabic numbers
\begin{enumerate}[label=\arabic*]
%...

% Alphabetical
\begin{enumerate}[label=\alph*]
%...
```

The output will look like this:

## 5 Change enumeration

- (i) One
  - (ii) Two
  - (iii) Three
- 1) One
  - 2) Two
  - 3) Three
- a) One
  - b) Two
  - c) Three

You can likewise use this to change the symbol of unordered lists:

```
\begin{itemize}[label=$\ast$]
  \item One
  \item Two
  \item Three
\end{itemize}
```

Which will consistently change the symbol of all items:

- \* One
- \* Two
- \* Three

## Summary

- **Unordered lists** can be created using the **itemize** environment.
- **Ordered lists** can be created using the **enumerate** environment.
- Lists can be nested and will be aligned and enumerated properly.
- Use the *enumitem* package to customize the symbols or enumeration.

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