LaTeX - List Stuctures

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February,2014

Abstract

Convenient and predictable list list formatting is one of the many advantages of using LaTeX. Here, we are going to learn about list stuctures and list formatting in LaTeX .

Contents

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1 Basic environments:

Lists often appear in documents, especially academic, as their purpose is often to present information in a clear and concise fashion. List structures in LaTeX are simply environments which essentially come in three flavors: itemize, enumerate and description.

All lists follow the basic format:

```
\begin{list_type}
  \item The first item
  \item The second item
  \item The third etc \ldots
\end{list_type}
```

All three of these types of lists can have multiple paragraphs per item: just type the additional paragraphs in the normal way, with a blank line between each. So long as they are still contained within the enclosing environment, they will automatically be indented to follow underneath their item.(No additional package is required for using them)

1.1 Itemize:

This environment is for your standard bulleted list of items.

```
\begin{itemize}
  \item The first item
  \item The second item
  \item The third etc \ldots
\end{itemize}
```

This will provide output like:

- The first item
- The second item
- The third etc ...

1.2 Enumerate:

The enumerate environment is for ordered lists, where by default, each item is numbered sequentially.

```
\begin{enumerate}
  \item The first item
  \item The second item
  \item The third etc \ldots
\end{enumerate}
```

This will produce output like:

1. The first item

2. The second item

3. The third etc ...

1.3 Description:

The description environment is slightly different. You can specify the item label by passing it as an optional argument (although optional, it would look odd if you didn't include it!).

```
\begin{description}
  \item[First] The first item
  \item[Second] The second item
  \item[Third] The third etc \ldots
\end{description}
```

This will produce output like:

First The first item

Second The second item

Third The third etc ...

Sometimes you want a description where the text begins on a new line. This cannot easily be done with \\. The trick is to use **\hfill**.

```
\begin{description}
  \item[First] \hfill \\
  The first item
  \item[Second] \hfill \\
  The second item
  \item[Third] \hfill \\
  The third etc \ldots
\end{description}
```

It will produce output like:

First
: The first item

Second
: The second item

Third
: The third etc ...

2 Nested list:

2.1 Using only itemize:

```
\begin{itemize}
\item The first item
```

contd. to next page

contd. from previous page

```
\begin{itemize}
\item The second level first nested item
\begin{itemize}
\item The third level first nested item
\begin{itemize}
\item The fourth level first nested item
\item The fourth level second nested item
\end{itemize}
\item The third level second nested item
\end{itemize}
\item The second level second nested item
\end{itemize}
\item The second item
\end{itemize}
```

This will produce output like:

- The first item.
  - The second level first nested item
    - The third level first nested item
      - The fourth level first nested item
      - The fourth level second nested item
    - The third level second nested item
  - The second level second nested item
- The second item

2.2 Using only enumerate:

```
\begin{enumerate}
\item The first item
\begin{enumerate}
\item The second level first nested item
\begin{enumerate}
\item The third level first nested item
\begin{enumerate}
\item The fourth level first nested item
\item The fourth level second nested item
\end{enumerate}
\item The third level second nested item
\end{enumerate}
\item The second level second nested item
\end{enumerate}
\item The second item
\end{enumerate}
```

It will produce output like:

1. The first item
    (a) The second level first nested item
        i. The third level first nested item
            A. The fourth level first nested item
            B. The fourth level second nested item
        ii. The third level second nested item

(b) The second level second nested item

2. The second item

However, you can use a combo of both. Like the following code:

```
\begin{itemize}
\item The first item
\begin{enumerate}
\item The first nested item
\item The second nested item
\end{enumerate}
\item The second item
\end{itemize}
```

3 Customizing lists:

3.1 Line spacing issue:

As you may have noticed, in standard LaTeX document classes, the vertical spacing between items, and above and below the lists as a whole, is more than between paragraphs: it may look odd if the descriptions are too short.

3.1.1 Customizing using packages:

If you want tightly-packed lists, use the **mdwlist** package (included in the **mdwtools bundle**), which provides compact, "starred" versions of the previous environments, i.e. **itemize*, enumerate* and description***. They work exactly in the same way, but the output is more compact. Other packages providing compacted lists are **paralist** and **enumitem**.

Alternatively, use the memoir class and with **\tightlists**.

3.1.2 Customizing manually:

Inside lists you can redefine some length/dimension variables of **LaTeX**, for example using:

```
\begin{itemize} \itemsep1pt \parskip0pt \parsep0pt
  \item first item
  \item second item
\end{itemize}
```

This will produce output like:

- first item
- second item

Now, compare this spacing with the normal one:

- The first item

- The second item

Alternatively, to create a unified look in your document you can redefine the enumerate environment:

```
\let\oldenumerate\enumerate
\renewcommand{\enumerate}{
  \oldenumerate
  \setlength{\itemsep}{1pt}
  \setlength{\parskip}{0pt}
  \setlength{\parsep}{0pt}
}
```

Another approach is to redefine the \item command globally.

```
\newlength{\wideitemsep}
\setlength{\wideitemsep}{.5\itemsep}
\addtolength{\wideitemsep}{-7pt}
\let\olditem\item
\renewcommand{\item}{\setlength{\itemsep}
{\wideitemsep}\olditem
```

3.2 Customizing list styles and numberings:

3.2.1 Customizing enumerated lists:

Using packages:

Using enumerate package: This package gives the enumerate environment an optional argument to mention the style of the numbering:

```
\begin{enumerate}[style]
```

The options A, a, I, i and 1 define the style and are self-explanatory, anything else is treated as text. To use any of the style tokens as text they can be enclosed in braces, e.g. A will give a literal A.

Some examples:

A-a one

A-b two

This is done by using the code:

```
\begin{enumerate}[{A}-a]
\item one
\item two
\end{enumerate}
```

Now, we will illustrate an example to make you understand the customization of enumerated list syles within nested list with the help of **enumerate** package.

EX i. one

EX ii. two

1. one
2. two
   a) one of two
   b) two of two

This is done by the following code:

```
\begin{enumerate}[EX i.]
\item one
\item two
\begin{enumerate}[{example} a)]
\item one of two
\item two of two
\end{enumerate}
\end{enumerate}
```