Packages

If you define a lot of new environments and commands, the preamble of your document will get quite long. In this situation, it is a good idea to create a **LaTeX package** containing all your command and environment definitions.

Syntax:

\usepackage{package_name}

Examples:

1. \usepackage{amsmath}
2. \usepackage{graphicx}
3. \usepackage{array}

Some list of packages reference given below.

Package name	Description
Inputenc	To choose the encoding of the input text. You might need it if you are writing documents in a language other than English.
Amsmath	It contains the advanced math extensions for LaTeX. The complete documentation should be in your LaTeX distribution; the file is called amsdoc, and can be dvi or pdf.
Amssymb	It adds new symbols in to be used in math mode.
Array	It extends the possibility of LaTeX to handle tables, fixing some bugs and adding new features. Using it, you can create very complicated and customized tables.
Graphic	Allows you to insert graphic files within a document.
mhchem	allows you to easily type chemical species and equations. It automatically formats chemical species so you don't have to use subscript commands. It also Allows you to draw chemical formulas.
Geometry	For easy management of document margins and the document page size
wrapfig	Allows figures or tables to have text wrapped around them
Enumitem	Adds support for arbitrarily-deep nested lists (useful for outlines)
Color	The color package provides both foreground (text, rules, etc.) and background colour management; it uses the device driver configuration mechanisms of the graphics package to determine how to control its ouptut.
Multirow	Create tabular cells spanning multiple rows
Tabu	Flexible LATEX tabulars
chemfig	Draw molecules with easy syntax

Lists

List are basic elements in a document, when used correctly they keep concepts organized and structured.

Unordered lists:

The unordered (unnumbered) lists are produced by the itemize environment. Each entry must be preceded by the control sequence \item.

```
\begin{itemize}
  \item The individual entries are indicated with a black dot, a
so-called bullet.
  \item The text in the entries may be of any length.
\end{itemize}
```

Output:

- The individual entries are indicated with a black dot, a so-called bullet.
- The text in the entries may be of any length.

By default the individual entries are indicated with a black dot, so-called bullet. The text in the entries may be of any length.

Ordered lists:

Ordered list have the same syntax inside a different environment:

```
\begin{enumerate}
  \item The labels consists of sequential numbers.
  \item The numbers starts at 1 with every call to the enumerate
environment.
\end{enumerate}
```

Output:

1. This is the first entry in our list
2. The list numbers increase with each entry we add

The ordered lists are generated by a \enumerate environment and each entry must be preceded by the control sequence \item, which will automatically generate the number labelling the item. The enumerate labels consists of sequential numbers, these numbers starts at 1 with every call to the enumerateenvironment.

Nested Lists:

In LATEX you can insert a list inside another list. The above lists may be included within one another, either mixed or of one type, to a depth of four levels.

```
\begin{enumerate}
   \item The labels consists of sequential numbers.
   \begin{itemize}
     \item The individual entries are indicated with a black dot,
a so-called bullet.
     \item The text in the entries may be of any length.
   \end{itemize}
   \item The numbers starts at 1 with every call to the enumerate
environment.
\end{enumerate}
```

Output:

1. The labels consists of sequential numbers.
   - The individual entries are indicated with a black dot, a so-called bullet.
   - The text in the entries may be of any length.
2. The numbers starts at 1 with every call to the enumerate environment.

List styles

As many other LATEX elements, unordered and ordered list styles can be personalized.

Ordered lists

The numbering styles change depending on the depth of the nested lists:

```
 \begin{enumerate}
   \item First level item
   \item First level item
   \begin{enumerate}
     \item Second level item
     \item Second level item
     \begin{enumerate}
       \item Third level item
       \item Third level item
       \begin{enumerate}
         \item Fourth level item
         \item Fourth level item
       \end{enumerate}
     \end{enumerate}
   \end{enumerate}
 \end{enumerate}
```

Output:

1. First level item
2. First level item
   (a) Second level item
   (b) Second level item
      i. Third level item
      ii. Third level item
         A. Fourth level item
         B. Fourth level item

The default numbering scheme is:

Arabic number (1, 2, 3, ...) for Level 1

Lowercase letter (a, b, c, ...) for Level 2

Lowercase Roman numeral (i, ii, iii, ...) for Level 3

Uppercase letter (A, B, C, ...) for Level 4.

These numbers can be changed by redefining the commands that typeset the numbers of various list levels. For example:

```
\renewcommand{\labelenumii}{\Roman{enumii}}
\begin{enumerate}
  \item First level item
  \item First level item
  \begin{enumerate}
    \item Second level item
    \item Second level item
    \begin{enumerate}
      \item Third level item
      \item Third level item
      \begin{enumerate}
        \item Fourth level item
        \item Fourth level item
      \end{enumerate}
    \end{enumerate}
\end{enumerate}
\end{enumerate}
```

Output:

1. First level item
2. First level item
    I Second level item
    II Second level item
        i. Third level item
        ii. Third level item
            A. Fourth level item
            B. Fourth level item

The command \renewcommand{\labelenumii}{\Roman{enumii}} changes the second level to upper case Roman numeral. It is possible to change the labels of any level,
replace labelenumii for one of the listed below.

\theenumi for Level 1

\theenumii for Level 2

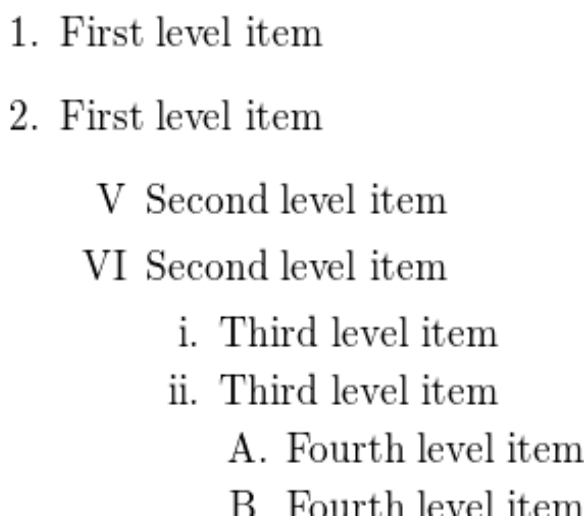
\theenumiii for Level 3

\theenumiv for Level 4

The command must be placed in the preamble to change the labels globally or right before \ begin{enumerate} to change labels only in this list. In numbered lists the counter is incremented by \item before it is printed, and starts from 1,a,i,A,I. This can be changed:

```
\renewcommand{\labelenumii}{\Roman{enumii}}
\begin{enumerate}
  \item First level item
  \item First level item
  \begin{enumerate}
    \setcounter{enumii}{4}
    \item Second level item
    \item Second level item
      \begin{enumerate}
      \item Third level item
      \item Third level item
        \begin{enumerate}
        \item Fourth level item
        \item Fourth level item
      \end{enumerate}
    \end{enumerate}
  \end{enumerate}
\end{enumerate}
```

Output:



To change the start number or letter you must use the \setcounter command. In the example, to change the start number of level 2 to V the command \setcounter{enumii}{4} was used.

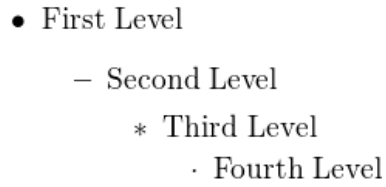
To set the start number to any other counter change enumii for any of these:

- enumi for Level 1
- enumii for Level 2
- enumiii for Level 3
- enumiv for Level 4

Unordered lists:

The label scheme of unordered lists also changes depending on the depth of the nested list:

```
\begin{itemize}
  \item  First Level
  \begin{itemize}
    \item  Second Level
    \begin{itemize}
      \item  Third Level
      \begin{itemize}
        \item  Fourth Level
      \end{itemize}
    \end{itemize}
  \end{itemize}
\end{itemize}
```



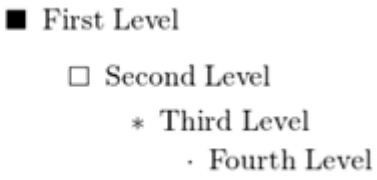
The default label scheme for itemized lists is:

- Level 1 is `\textbullet` (•),
- Level 2 is `\textendash` (–) ,
- Level 3 is `\textasteriskcentered` (*)
- Level 4 is `\textperiodcentered` (·).

These labels can be changed by redefining the commands that typeset them for various list levels. For example, to change Level 1 to black square and Level 2 to white square we'll use :

```
\renewcommand{\labelitemi}{$\blacksquare$}
\renewcommand\labelitemii{$\square$}
\begin{itemize}
  \item  First Level
  \begin{itemize}
    \item  Second Level
    \begin{itemize}
      \item  Third Level
      \begin{itemize}
        \item  Fourth Level
      \end{itemize}
    \end{itemize}
  \end{itemize}
\end{itemize}
```

Output:



The mathematical symbols used in the previous example belong to the amssymb package, so you have to add \usepackage{amssymb} to your preamble.

To redefine the label use one of the next commands, depending on the level of list mark you intend to change:

- `labelitemi` for Level 1
- `labelitemii` for Level 2
- `labelitemiii` for Level 3

- `labelitemiv` for Level 4

You can also change the item label for a specific entry, for example:

```
\begin{itemize}
  \item  Default item label for entry one
  \item  Default item label for entry two
  \item[$\square$]  Custom item label for entry three
\end{itemize}
```

Output:

- Default item label for entry one
- Default item label for entry two
- □ Custom item label for entry three

All you have to do is pass the desired mark as a parameter inside brackets to the item line.