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Environments

Environments are used to format blocks of text in a LaTeX documents. This article explains how to use environments and how to define new ones.

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Introduction

Below you can see a very simple example on how to use an environment.

```
\begin{center}
This text will be centred since it is inside a special
environment. Environments provide a efficient way of modifying
blocks of text within your document.
\end{center}
```

This text will be centred since it is inside a
special environment. Environments provide a
efficient way of modifying blocks of text
within your document.

(/learn/File:CommsAndEnvsEx7.png)

In this example all the text inside the *center* environment is centred.

↗ Open an example in ShareLaTeX (https://www.sharelatex.com/project/new/template?zipUrl=/project/53082657fdd69d780d003220/download/zip&templateName=Environments&compiler=pdf)

Environments

Environments are delimited by an opening tag `\begin` and a closing tag `\end`. Everything inside those tags will be formatted in a special manner depending on the type of the environment.

```
\begin{tabular}{ c c c }
cell1 & cell2 & cell3 \\
cell4 & cell5 & cell6 \\
cell7 & cell8 & cell9 \\
\end{tabular}
```

cell1cell2cell3
cell4cell5cell6
cell7cell8cell9

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https://www.sharelatex.com/learn/Environments

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This environment *tabular* takes an additional parameter { c c c } to determine the alignment of the cells (See the Tables (/learn/Tables) article for more information)

Environments may accept optional parameters that usually are passed inside brackets []

➔ Open an example in ShareLaTeX (<https://www.sharelatex.com/project/new/template?zipUrl=/project/53082657fdd69d780d003220/download/zip&templateName=Environments&compiler=pdf>)

Defining a new environment

Just as with commands (/learn/Commands), you can define new environments.

Defining simple environments

The new environment definition is achieved by the `\newenvironment` tag:

```
\newenvironment{boxed}
{ \begin{center}
  \begin{tabular}{|p{0.9\textwidth}|}
  \hline \\
  }
{
  \\\\ \hline
  \end{tabular}
  \end{center}
}
```

%-----

Below this line a boxed environment is used

```
\begin{boxed}
This is the text formatted by the boxed environment
\end{boxed}
```

This text is again outside the environment

Below this line a boxed environment is used

This is the text formatted by the boxed environment

(/learn/File:CommsAndEnvsEx8.png)

This text is again outside the environment

This environment will draw a box around the text within.

Right after the `\newcommand`, in between braces, you must write the name of the environment, *boxed* in the example. Below that are two pairs of braces. Inside the first pair of braces is set what your new environment will do **before** the text within, then inside the second pair of braces declare what your new environment will do **after** the text.

In the example, in between the *before* braces a horizontal line is drawn and the *tabular* environment is started to draw the vertical lines. Inside the *after* braces another horizontal line is drawn and the *tabular* environment is closed.

➔ Open an example in ShareLaTeX (<https://www.sharelatex.com/project/new/template?zipUrl=/project/53082657fdd69d780d003220/download/zip&templateName=Environments&compiler=pdf>)

Defining environments with parameters

Environments that accept parameters can also be defined. Let's enhance the previous example to put a title for the box:

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```
\newenvironment{boxed}[1]
{
\begin{center}
#1\\[1ex]
\begin{tabular}{|p{0.9\textwidth}|}
\hline\\
}
{
\\[1ex]
\end{tabular}
\end{center}
}
```

%-----

Below this line a boxed environment is used

```
\begin{boxed}{Title of the Box}
This is the text formatted by the boxed environment
\end{boxed}
```

This text is again outside the environment

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Below this line a boxed environment is used

Title of the Box

This is the text formatted by the boxed environment

(/learn/File:CommsAndEnvsEx9.png)

This text is again outside the environment

As you see, the command definition is almost the same as in the example of the previous section, except for [1] that sets the number of parameters to be used in the environment; and #1\\[1ex] that inserts the parameter at the top of the box and also separates the title from the box by a 1ex blank space.

See the reference guide for a more complex example.

Numbered environments

Numbered environments can be created either manually or with the command `\newtheorem` provided by the package `amsmath`, these commands can also include a `\label` tag for cross reference.

%In the preamble

%Numbered environment

```
\newcounter{example}[section]
\newenvironment{example}[1][\refstepcounter{example}\par\medskip
\noindent \textbf{Example~\theexample. #1} \rmfamily}{\medskip}
```

%Numbered environment defined with Newtheorem

```
\usepackage{amsmath}
\newtheorem{SampleEnv}{Sample Environment}[section]
```

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```
\begin{example}
User-defined numbered environment
\end{example}
```

```
\begin{SampleEnv}
User-defined environment created with the \texttt{\newtheorem} command.
\end{SampleEnv}
```

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Example 1. User-defined numbered environment

Sample Environment 1.1 *User-defined environment created with the `newtheorem` command.*

(/learn/File:NumberedEnvsEx.png)

In the manually-defined environment the command `\newcounter{example}[section]` creates a counter called *example* that will be reset every time a new section is started. The counter is printed with `\refstepcounter{example}` within the environment definition, and its value is incremented by one. See the article about counters (/learn/Counters) to learn more.

The command `\newenvironment` from the package **amsmath** also creates a numbered environment, this command takes three parameters: the name of the new environment, the text to be printed in blackbold font at the beginning of the line and an optional parameter that determines how the counter is printed and when it's reset. In the example the values are `SampleEnv`, `Sample Environment` and `section` respectively.

➡ Open an example in ShareLaTeX (<https://www.sharelatex.com/project/new/template?zipUrl=/project/53082657fdd69d780d003220/download/zip&templateName=Environments&compiler=pdf>)

Overwriting existing environments

Environments can be overwritten with `\renewcommand`. The syntax is similar to that of the new command definition.

```
\renewenvironment{itemize}
{ \begin{center} \begin{em} }
{ \end{em} \end{center} }
%-----
\begin{itemize}
This is now a environment that centres the text and
emphasises it
\end{itemize}
```

This is now a environment that centres the text and emphasises it (/learn/File:CommsAndEnvsEx10.png)

In this example we overwrite the *itemize* environment so instead of listing elements, this new environment centres and italicises the text within.

➡ Open an example in ShareLaTeX (<https://www.sharelatex.com/project/new/template?zipUrl=/project/53082657fdd69d780d003220/download/zip&templateName=Environments&compiler=pdf>)

Reference guide

Advanced example: Defining a new environment for chapter

```

\documentclass{report}
\makeatletter
\def\thickhrulefill{\leavevmode \leaders \hrule height 1.2ex \hfill \kern
\z@}
\def\@makechapterhead#1{
  \vspace*{10\p@}%
  {\parindent \z@ \centering \reset@font
    \thickhrulefill\quad
    \scshape\bfseries\textit{\@chapapp}{} \thechapter}
    \quad \thickhrulefill
  \par\nobreak
  \vspace*{10\p@}%
  \interlinepenalty\@M
  \hrule
  \vspace*{10\p@}%
  \Huge \bfseries #1 \par\nobreak
  \par
  \vspace*{10\p@}%
  \hrule
  \vskip 100\p@
}
}

\begin{document}
\chapter{Editing compile}
\end{document}

```

Chapter 1

Editing compile

(/learn/File:Chapter.png)

Further reading

For more information see:

- Commands (/learn/Commands)
- Understanding packages and class files (/learn/Understanding_packages_and_class_files)
- Writing your own package (/learn/Writing_your_own_package)
- Writing your own class (/learn/Writing_your_own_class)
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- The not so short introduction to L^AT_EX 2_ε (<http://www.ctan.org/tex-archive/info/lshort/>)
- LaTeX/Creating Packages on WikiBooks (http://en.wikibooks.org/wiki/LaTeX/Creating_Packages)