Sections, Subsections, Paragraphs, etc.

Command

\section{Title of the section}

Examples

\section{ What is LaTeX?}
LaTeXis a tool used to create professional-looking documents. It is based on the WYSIWYM (what you see is what you mean) idea, meaning you only have focus on the contents of your document and the computer will take care of the formatting. Instead of spacing out text on a page to control formatting, as with Microsoft Word or LibreOffice Writer, users can enter plain text and let LaTeXtake care of the rest.

Output

1 What is LaTeX?

LaTeXis a tool used to create professional-looking documents. It is based on the WYSIWYM (what you see is what you mean) idea, meaning you only have focus on the contents of your document and the computer will take care of the formatting. Instead of spacing out text on a page to control formatting, as with Microsoft Word or LibreOffice Writer, users can enter plain text and let LaTeXtake care of the rest.

Labels and referencing

Commands

\label{Name of the section, table,... }
\ref{Name of the section, table,... }

Examples

\section{ Why learn LaTeX?}
\label{sec2 }
LaTeX is used all over the world for scientific documents, books, as well as many other forms of publishing. Not only can it create beautifully typeset documents, but it allows users to very quickly tackle the more complicated parts of typesetting, such as inputting mathematics, creating tables of contents, referencing and creating bibliographies, and having a consistent layout across all sections. Due to the huge number of open source packages available (more on this later), the possibilities with LaTeXare endless. These

packages allow users to do even more with LaTeX, such as add footnotes, draw schematics, create tables etc.

Section \ref{sec2} explains why we need to learn LaTeX.

Output

2 Why learn LaTeX?

LaTeXis used all over the world for scientific documents, books, as well as many other forms of publishing. Not only can it create beautifully typeset documents, but it allows users to very quickly tackle the more complicated parts of typesetting, such as inputting mathematics, creating tables of contents, referencing and creating bibliographies, and having a consistent layout across all sections. Due to the huge number of open source packages available (more on this later), the possibilities with LaTeXare endless. These packages allow users to do even more with LaTeX, such as add footnotes, draw schematics, create tables etc.

Section 2 explains why we need to learn LaTeX.

Lists

Environments

Enumerate
\begin{enumerate}
\item .....
\end{enumerate}

Itemize
\begin{itemize}
\item .....
\end{itemize}

Description
\begin{description}
\item[...] .....
\end{description}

Example

\begin{itemize}

```
    \item Books
    \item Pens
    \item Pencils
\end{itemize}
```

Output

- Books
- Pens
- Pencils

Example

```
\begin{enumerate}
    \item Sugar
    \item Cream
    \item Chocolate
\end{enumerate}
```

Output

1. Sugar
2. Cream
3. Chocolate

Example

```
\begin{description}
    \item[dog] A loving animal that likes to sleep on the furniture.
    \item[cat] Aloof creature that can warm your feet on a winter's
    night.
    \item[Horse] Large animal, gives great rides. Eats a lot, luckily
    doesn't sleep on the furniture.
\end{description}
```

Output

dog A loving animal that likes to sleep on the furniture.

cat Aloof creature that can warm your feet on a winter's night.

Horse Large animal, gives great rides. Eats a lot, luckily doesn't sleep on the furniture.

Example

```
\begin{itemize}
    \item center environment
    \item quote environment
    \item the three list environments:
        \begin{enumerate}
        \item enumerate
        \item itemize
        \item description
        \end{enumerate}
\end{itemize}
```

Output

- center environment
- quote environment
- the three list environments:
    1. enumerate
    2. itemize
    3. description

Multicolumns

Package

```
\usepackage{multicol}
```

Environment

```
\begin{multicols}{No. of columns}
.....
\end{multicols}
```

Example

```
\begin{multicols}{3}
LaTeXis a tool used to create professional-looking documents. It is based on the WYSIWYM (what you see is what you mean) idea, meaning you only have focus on the contents of your document and the computer will take care of the formatting. Instead of spacing out text on a page to control formatting, as with Microsoft Word or LibreOffice Writer, users can enter plain text and let LaTeXtake care of the rest.
\end{multicols}
```

Output

LaTeXis a tool used to create professional-looking documents. It is based on the WYSIWYM (what you see is what you mean) idea, meaning you only have focus on the contents of your document and the computer will take care of the formatting. Instead of spacing out text on a page to control formatting, as with Microsoft Word or LibreOffice Writer, users can enter plain text and let LaTeXtake care of the rest.

Figures

Package

```
\usepackage{graphicx}
```

Path

```
\graphicspath{{folder name/}}
```

Environment

```
\begin{figure}
.....
\end{figure}
```

Command

```
\includegraphics[optional arguments]{name of the figure}
```

Example 1

```
\begin{figure}
\includegrapics[scale=0.5]{camel}
\end{figure}
```

Output

Example 2

```
\begin{figure}
\centering
\includegrapics[scale=0.5]{camel}
\caption{Camels}
\label{fig:camel}
\end{figure}
```

The figure \ref{fig:camel} shows the behaviour of camels in a open zoo.

Output

Fig. 1: Camels

The figure 1 shows the behaviour of camels in a open zoo.

Sub-figures

Packages

\usepackage{graphicx}
\usepackage{caption}
\usepackage{subcaption}

Path

\graphicspath{{folder name/}}

Environment

\begin{figure}
\begin{subfigure }[b]{size of the subfigure}
.....
\end{subfigure}
\end{figure}

Command

\includegraphics[optional arguments]{name of the figure}

Example 1

\begin{figure}
\begin{subfigure}[b]{0.4\textwidth}
\includegrapics[width=\textwidth]{cat}
\end{subfigure}
\begin{subfigure}[b]{0.4\textwidth}
\includegrapics[width=\textwidth]{dog}
\end{subfigure}
\end{figure}

Output

Example 2

```
\begin{figure}
\centering
\begin{subfigure}[b]{0.4\textwidth}
\includegrapics[width=\textwidth]{cat}
\caption{Cats}
\label{fig:cat}
\end{subfigure}
\begin{subfigure}[b]{0.4\textwidth}
\includegrapics[width=\textwidth]{dog}
\caption{Dogs}
\label{fig:dog}
\end{subfigure}
\end{figure}
```

Output

(a) Cats

(b) Dogs

Fig. 3: Animals

Tables

Environment

```
\begin{table}{Position of the table}
\begin{tabular}{table spec}
table here
\end{tabular}
\end{table}
```

Example 1

```
\begin{table}[h]
\centering
\begin{tabular}{l |l |l}
A & B & C \\
\hline
1 & 2 & 3 \\
4 & 5 & 6 \\
\end{tabular}
```

Output

A	B	C
1	2	3
4	5	6

Example 2

```
\begin{table}[h]
\centering
\begin{tabular}{|l |l |l |}
\hline
Day & Max Temp & Min Temp \\
\hline
\hline
Mon & 20 & 13 \\
Tue & 22 & 14 \\
Wed & 23 & 12 \\
Thurs & 25 & 13 \\
Fri & 18 & 7 \\
Sat & 15 & 13 \\
Sun & 20 & 13 \\
\end{tabular}
\caption{First week }
\lable{tab:first }
\end{table}
```

Output

Day	Max Temp	Min Temp
Mon	20	13
Tue	22	14
Wed	23	12
Thurs	25	13
Fri	18	7
Sat	15	13
Sun	20	13

Tab. 1: First week

Sub-tables

Environment

```
\begin{table}{position of the table}
\begin{subtable}[position of the sub-table]{size of the sub-table}
\begin{tabular}{table spec}
table here
\end{tabular}
\end{subtable}
.....
\end{table}
```

Example

```
\begin{table}[h]
\begin{subtable}[h]{0.45\textwidth}
\centering
\begin{tabular}{|l |l |l |}
\hline
Day & Max Temp & Min Temp \\
\hline
\hline
Mon & 20 & 13 \\
Tue & 22 & 14 \\
Wed & 23 & 12 \\
Thurs & 25 & 13 \\
Fri & 18 & 7 \\
Sat & 15 & 13 \\
Sun & 20 & 13 \\
```

```
\end{tabular}
\caption{First week }
\lable{tab:first }
\end{subtable}
\hfill
\begin{subtable}[h]{0.45\textwidth}
\centering
\begin{tabular}{|l |l |l |}
\hline
Day & Max Temp & Min Temp \\
\hline
\hline
Mon & 17 & 11 \\
Tue & 16 & 10 \\
Wed & 14 & 8 \\
Thurs & 12 & 5 \\
Fri & 15 & 7 \\
Sat & 16 & 12 \\
Sun & 15 & 9 \\
\end{tabular}
\caption{Second week }
\lable{tab:second }
\end{subtable}
\end{table}
```

Output

Day	Max Temp	Min Temp
Mon	20	13
Tue	22	14
Wed	23	12
Thurs	25	13
Fri	18	7
Sat	15	13
Sun	20	13

(a) First week

Day	Max Temp	Min Temp
Mon	17	11
Tue	16	10
Wed	14	8
Thurs	12	5
Fri	15	7
Sat	16	12
Sun	15	9

(b) Second week

Tab. 2: Max and min temps recorded in the first two weeks of February in Wuhan

Mathematical equations

Packages

\usepackage{amsmath}
\usepackage{amsfonts}

Command

$ equation $
$$ equation $$

Example 1

Diameter of a circle is given by $ 2 \pi r $

Output

Diameter of a circle is given by $2\pi r$

Example 2

The mass-energy equivalence is described by the famous equation
$ $ E=mc^{2} $ $
discovered in 1905 by Albert Einstein.

Output

The mass-energy equivalence is described by the famous equation

$$E = mc^2$$

discovered in 1905 by Albert Einstein.

Advanced mathematical equations

Packages

\usepackage{amsmath}
\usepackage{amsfonts}

Environment

\begin{eqnarray}
.....
\end{eqnarray}

Example 1

```
\begin{eqnarray}
P_{1,0}^{'}(t) & = & -(\lambda +\alpha_{0}) P_{1,0}(t)+\mu P_{0,1}(t)
\end{eqnarray}
```

Output

$$P_{1,0}^{'}(t) = -(\lambda + \alpha_0)P_{1,0}(t) + \mu P_{0,1}(t) \quad (1)$$

Example 2

```
\begin{eqnarray}\label{eq:1}
P_{1,0}^{'}(t) & = & -\lambda P_{1,0}(t) +\alpha_{0} P_{1,0}(t)+\mu
P_{0,1}(t)\nonumber
& = & -(\lambda +\alpha_{0}) P_{1,0}(t)+\mu P_{0,1}(t)
\end{eqnarray}
```

Output

$$\begin{aligned} P_{1,0}^{'}(t) &= -\lambda P_{1,0}(t) + \alpha_0 P_{1,0}(t) + \mu P_{0,1}(t) \\ &= -(\lambda + \alpha_0)P_{1,0}(t) + \mu P_{0,1}(t) \end{aligned} \quad (2)$$

Example 3

```
\begin{eqnarray}
P_{1,0}^{'}(t) & = & -(\lambda +\alpha_{0}) P_{1,0}(t)+\mu P_{0,1}(t)\label{eq:2}
P_{1,n}^{'}(t) & = & -(\lambda +\alpha_{0}) P_{1,n}(t)+\lambda P_{1,n-
1}(t);n \geq 1\label{eq:3}
\end{eqnarray}
```

Output

$$P_{1,0}^{'}(t) = -(\lambda + \alpha_0)P_{1,0}(t) + \mu P_{0,1}(t) \quad (3)$$

$$P_{1,n}^{'}(t) = -(\lambda + \alpha_0)P_{1,n}(t) + \lambda P_{1,n-1}(t); n \geq 1 \quad (4)$$

Bibliographies and in-text citations

Environment

```
\begin{thebibliography}{}
.....
\end{thebibliography}
```

Example 1

Reference list

```
\begin{thebibliography}{}
\bibitem{ham}Hamburger, C.: Quasimonotonicity, regularity and duality for nonlinear systems of partial differential equations. Ann. Mat. Pura Appl. 169, 321–354 (1995)
\end{thebibliography}
```

In-text citations

```
Hamburger \cite{ham} studied the regularity for nonlinear systems of partial differential equations.
```

Output

Reference list

[1] Hamburger, C.: Quasimonotonicity, regularity and duality for nonlinear systems of partial differential equations. Ann. Mat. Pura Appl. 169, 321–354 (1995)

In-text citations

Hamburger [1] studied the regularity for nonlinear systems of partial differential equations.

Example 2

Reference list

```
\begin{thebibliography}{}
\bibitem[Hamburger (1995)]{ham}Hamburger, C.: Quasimonotonicity, regularity and duality for nonlinear systems of partial differential equations. Ann. Mat. Pura Appl. 169, 321–354 (1995)
\end{thebibliography}
```

In-text citations

```
Hamburger \cite{ham} studied the regularity for nonlinear systems of partial differential equations.
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Output

Reference list

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