GSNS workshop: LaTeX beginners

TeXniCie
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Schedule

- Text document
- ⟨Exercises⟩
- Formulas
- Figures
- ⟨Exercises⟩
- Lists and Tables
- Finishing notes

Text document

Simple document

```
\documentclass{article}

\usepackage[utf8]{inputenc}

\title{My document}
\author{Vincent Kuhlmann}
\date{1 May 2021}
```

Preamble

```
\begin{document}
\maketitle
\section{Introduction}

Hello everyone!
\end{document}
```

Document

My document

Vincent Kuhlmann

1 May 2021

1 Introduction

Hallo iedereen!

Exercises!

Slides are available at
texnicie.nl

Math

There are two ways to typeset math:

inline mode

The trigonometric identity is given by $\sin^2(\theta) + \cos^2(\theta) = 1$ for all θ.

display mode

The Pythagorean trigonometric identity is given by

$$\sin^2(\theta) + \cos^2(\theta) = 1 \tag{1}$$

The identity

$$1 + tan^2(\theta) = \frac{1}{cos^2\theta} \tag{2}$$

Is also called the Pythagorean trigonometric identity.

Inline math

Text and symbols between \(and \) are treated as **math sybmols**.

```
\documentclass[a5paper]{article}
\begin{document}
The trigonometric identity is
given by \( \sin^2(\theta) + \cos^2(\theta) = 1 \). This identity is also
called the Pythagorean trigonometric identity.
\end{document}
```

The trigonometric identity is given by $\sin^2(\theta) + \cos^2(\theta) = 1$. This identity is also called the Pythagorean trigonometric identity.

Math packages

The following three packages are useful for typesetting mathematics:

```
\documentclass[a4paper, 10pt]{article}
\usepackage{amsmath}
\usepackage{amssymb}
\usepackage{amsthm}
\begin{document}
\[
    ax^2 + bx + c = 0 \qquad
    \text{the general form of the quadratic equation}
\]
\end{document}
```

These provide options for adding text to formulae, extra symbols such as $\boxplus$, $\rightsquigarrow$ and $\mathbb{R}$ and better theorem and proof environments.

Basic math

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2 + b^2} $`

Display math

There are many display math environments. Today we focus on the **align** environment.

```
 The double angle formula can now be rewritten as
\begin{align}
    \cos(2\theta) &=  \cos^2\theta - sin^2\theta \\
                  &= 2\cos^2\theta - 1
\end{align}
```

The double angle formula can now be rewritten as

$$\cos(2\theta) = \cos^2\theta - sin^2\theta \tag{3}$$
$$= 2\cos^2\theta - 1 \tag{4}$$

Figures

Exercises!

Slides are available at
texnicie.nl

Lists

There are three types of lists environments in latex.
enumerate is used for information that has order:
itemize is used for information that does not have order:
description is used for information that has descriptions for each item

Examples

Enumerated list	**Itemized list**	**Descriptive list**
Biggest cities of the Netherlands	Members of the TeXniCie	Tech companies
▪ Amsterdam ▪ Rotterdam ▪ The Hague ▪ Utrecht	▪ Hanneke ▪ Thomas ▪ Tim ▪ Vincent	**Apple** Computer company **Facebook** Social media company **Microsoft** Software company

Lists

To make a list, start with the command `\begin{enumerate}`,`\begin{itemize}` or `\begin{description}` depending on the list environment and end with `\end{enumerate}`,`\end{itemize}` or `\end{description}` respectively. In front of each item use the command `\item`. In case of the descriptive environment add square braces to assign a label to each item: `\item[label]`

Examples

Itemized list

```
\begin{itemize}
\item Hanneke
\item Thomas
\item Tim
\item Vincent
\end{itemize}
```

Enumerated list

```
\begin{enumerate}
\item Amsterdam
\item Rotterdam
\item The Hague
\item Utrecht
\end{enumerate}
```

Descriptive list

```
\begin{description}
\item[Apple] Computer company
\item[Facebook] Social media company
\item[Microsoft] Software company
\end{description}
```

Nested Lists

It is also possible to have nested lists. For example:

- First level
  - second level
    - third level
  - second level
- First level

Tables

Tables are made in the **tabular** environment. When making a table you start with `\begin{tabular}`. Afterwards, an extra parameter must be given that tells Latex how the table will be formatted. For example `{l l l}` tells us that we want a table with three columns that are aligned to the left.
Inside of the tabular environment a new column is made with the &-symbol and a new row with \\.

Example

Name	Population
Amsterdam	903,399
Rotterdam	655,468
The Hague	553,417

```
\begin{tabular}{l l l}
Name & Population\\
Amsterdam & 903,399\\
Rotterdam & 655,468\\
The Hague & 553,417\\
\end{tabular}
```

Tables

You have now leaned how to make a table, but it would be nice if we could have seperator lines between rows and columns. For the columns you can add a pipe symbol between columns in the paramater. For seperator lines between rows the command `\hline` is used.

Example

Name	Population
Amsterdam	903,399
Rotterdam	655,468
The Hague	553,417

```
\begin{tabular}{||l | l||}
        \hline\hline
        Name & Population\\\hline
        Amsterdam & 903,399\\\hline
        Rotterdam & 655,468\\\hline
        The Hague & 553,417\\\hline\hline
\end{tabular}
```

Tables

Parameter options:

l Align columns to the left.

c Align columns to the centre.

r Align columns to the right.

Also note that just like images, tables can be figures

Example

Name	Population
Amsterdam	903,399
Rotterdam	655,468
The Hague	553,417

Figure 1: Biggest cities of NL

```
\begin{figure}
\begin{tabular}{||l | l||}
Name & Population\\\hline
Amsterdam & 903,399\\
Rotterdam & 655,468\\
\end{tabular}
\caption{Biggest cities of NL}
\end{figure}
```

Lists and Tables

Finishing notes

The end

Questions?

Stuck? Mail us at
contact@texnicie.nl

The slides can be found on
https://texnicie.nl

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