HUMBOLDT-UNIVERSITÄT ZU BERLIN

LaTeX for Linguists

LaTeX 2: Math mode & new commands

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Math mode 1

- LaTeX has a special mode for **formulae**.
- Text is in **italics**, **blanks** and **line breaks** are **ignored**.

```
$You shouldn't use text in math mode.$
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Math mode 1

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```
$You shouldn't use text in math mode.$
```

Youshouldn′tusetextinmathmode.

- With the command `\textrm{ }` inside the math mode, text in upright mode with blanks can be used.

```
$You shouldn't use \textrm{ text in math } mode.$
```

Youshouldn′tuse text in math *mode*.

Math environments

Two different math environments can be used for the math mode:

- for **inline** formulae: `$ test test $`

```
If $2^2+\sqrt{2}=c^4$, what is the value of $c$?
```

If $2^2 + \sqrt{2} = c^4$, what is the value of c?

Math environments

Two different math environments can be used for the math mode:

- for **inline** formulae: `$ test test $`

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If $2^2+\sqrt{2}=c^4$, what is the value of $c$?
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If $2^2 + \sqrt{2} = c^4$, what is the value of c?

- **display** style (*math environment* in narrow sense):
  `\[ test test \]` or `$$ test test $$`

```
If $$2^2+\sqrt{2}=c^4$$, what is the value of $c$?
```

If

$$2^2 + \sqrt{2} = c^4$$

, what is the value of c?

Equation environment

For **numbered equations**: `equation` environment

```
\begin{equation}
\label{eq:FirstEq}
\lim_{n \to \infty}
\sum_{k=1}^n \frac{1}{k^2}
= \frac{\pi^2}{6}
\end{equation}
```

$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{1}{k^2} = \frac{\pi^2}{6} \tag{1}$$

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$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{1}{k^2} = \frac{\pi^2}{6} \tag{1}$$

For **cross references** to numbered equations `\eqref{ }` can be used.

```
see \eqref{eq:FirstEq}

see \ref{eq:FirstEq}
```

see (1)
see 1

Math packages

Some symbols can only be used when specific math packages are loaded.

Math packages from the American Mathematical Society (AMS)

```
\usepackage{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage{amstext}
\usepackage{mathrsfs}
```

Customizing your commands

You can create your own commands!

```
$\langle e, t \rangle$

$\langle \langle e,t \rangle , \langle
\langle e,t \rangle ,t \rangle \rangle$
```

$\langle e, t \rangle$

$\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$

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```
$\langle e, t \rangle$

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```

$\langle e, t \rangle$

$\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$

Defining a command with **one argument** (for semantic types):

```
\newcommand{\type}[1]{\langle #1 \rangle}
```

The argument of the new command will be in angled brackets:

```
$\type{e,t}$

$\type{\type{e,t},\type{\type{e,t},t}}$
```

$\langle e, t \rangle$

$\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$

`\type{ }` can be embedded in further `\type{ }` commands!

Defining a command with **one argument** (for graphemes):

```
\newcommand{\ab}[1]{$\langle$#1$\rangle$}
```

The argument of the new command will be in angled brackets, but not in math mode:

```
\ab{buying a house}
```

(2) a. ⟨buying a house⟩ [with `ab`]

b. ⟨*buyingahouse*⟩ [with `type`]

`\ab{ }` cannot embed further `\ab{ }` commands!

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`\ab{ }` cannot embed further `\ab{ }` commands!

But try this:

```
\newcommand{\graph}[1]{\textlangle#1\textrangle}

\graph{test \graph{test}}
```

(3) ⟨test ⟨test⟩⟩

Defining a command **without arguments** (for abbreviations):

```
\newcommand{\ra}{$\rightarrow$}

\newcommand{\et}{$\type{e,t}$}

P \ra\ Q

\et
```

(4) $P \rightarrow Q$

(5) $\langle e, t \rangle$

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\newcommand{\et}{$\type{e,t}$}

P \ra\ Q

\et
```

(4) $P \rightarrow Q$

(5) $\langle e, t \rangle$

Defining a command with **more than one argument**:

```
\newcommand{\citegen}[3]{#1's #2 (#3)}

\citegen{Abney}{dissertation}{1987} is considered a milestone in NP Syntax.
```

Abney's dissertation (1987) is considered a milestone in NP Syntax.

Exercise

Go to
`https://github.com/langsci/latex4linguists/blob/master/1-2.md`
and follow the instructions of the **five blocks** in your `.tex` file.

Internet sources I

- Link: Akzente und Sonderzeichen in LaTeX.
  `https://de.wikibooks.org/wiki/LaTeX/_Akzente_und_Sonderzeichen`
  [Access: 10/10/2017]
- Link: LaTeX/Special Characters.
  `https://en.wikibooks.org/wiki/LaTeX/Special_Characters`
  [Access: 02/01/2019]

Literature I

Freitag, Constantin & Antonio Machicao y Priemer. 2015. LaTeX-Einführung für Linguisten. Manuscript. https://www.linguistik.hu-berlin.de/de/staff/amyp/latex-einfuehrung.

Knuth, Donald E. 1986. *The TeX book*. Boston: Addison-Wesley.

Kopka, Helmut. 1994. *LaTeX: Einführung*, vol. 1. Bonn: Addison-Wesley.