

Knowledge Representation & Symbolic Reasoning

Tips and typesetting for logic

Course: RO47014 Knowledge Representation and Symbolic Reasoning, TU Delft, CoR
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1 L^AT_EX Command reference

1.1 Online references

- L^AT_EX cheat sheet: https://kapeli.com/cheat_sheets/LaTeX_Math_Symbols.docset/Contents/Resources/Documents/index
- General L^AT_EX reference: https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes

1.2 Online tools

If you need the name of a command to display a particular symbol, you can use the following online tools.

- <http://detexify.kirelabs.org/classify.html> (for L^AT_EX symbols)
- <https://shapecatcher.com/> (for Unicode symbols)

If you need to write and compile L^AT_EX code easily, you can use an online editor such as Overleaf: <https://www.overleaf.com/>. See also: <https://www.overleaf.com/edu/tudelft>.

1.3 Logical derivations

To write derivations, you can either use a command such as

`\frac{A \quad A \Rightarrow B}{B} \mathrm{MP}`

which yields the following result:

$$\frac{A \quad A \Rightarrow B}{B} \mathrm{MP}$$

or the command

`\infer[\mathrm{MP}]{B}{A \ & \quad A \Rightarrow B}`

from the package `proof`, which yields the following result:

$$\frac{A \quad A \Rightarrow B}{B} \mathrm{MP}.$$

As a guideline, please indicate the rule that you use for a derivation, such as MP (Modus Ponens) in the examples above.

1.4 Useful commands for symbols

Command	Result
<code>\wedge</code>	\wedge
<code>\vee</code>	\vee
<code>\neg</code>	\neg
<code>\rightarrow</code>	\Rightarrow
<code>\leftrightarrow</code>	\Leftrightarrow
<code>\equiv</code>	\equiv
<code>\models</code>	\models
<code>\vdash</code>	\vdash
<code>x\quad y</code>	$x \quad y$ (space, for equations)
<code>x\ y</code>	$x y$ (smaller space, for equations)
<code>x~y</code>	$x y$ (non-breakable space)
<code>\exists x</code>	$\exists x$
<code>\forall x</code>	$\forall x$
<code>x \in A</code>	$x \in A$
<code>\subset</code>	\subset
<code>\subseteq</code>	\subseteq
<code>\sqsubseteq</code>	\sqsubseteq
<code>\top, \bot</code>	\top, \perp
<code>\cup, \cap</code>	\cup, \cap
<code>\sqcup, \sqcap</code>	\sqcup, \sqcap
regular text	regular text
<code>\texttt{typewriter}</code>	typewriter
<code>\textsc{np}</code>	NP
<code>\mathcal{ALC}</code>	\mathcal{ALC}

2 Additional notation

This section is not necessarily in the scope of the course, but it can be interesting to know that alternative notations exist, that you may encounter in papers. In the table below, "sometimes" refers to the fact that it depends on the particular context the symbol appears in. In scientific writing, symbols are usually properly introduced, so that there is no ambiguity possible due to the cultural variability in writing conventions.

Command	Result	Remark
<code>\rightarrow</code>	\rightarrow	Sometimes equivalent to \Rightarrow
<code>\leftrightarrow</code>	\leftrightarrow	Sometimes equivalent to \Leftrightarrow
<code>\supset</code>	\supset	Sometimes equivalent to \Rightarrow
...

For more information, refer to https://en.wikipedia.org/wiki/First-order_logic#Logical_symbols.