

Relation Symbols

A L^AT_EX 2_ε Package

Byron Cook, Tauba Auerbach, David Reinfurt

v 0.99999999999999 05/08/2014

1 Installation

The program termination problem, also known as the uniform halting problem, can be defined as: *Using a finite amount of time: determine whether a given program will always finish running or could possibly execute forever.*

The Metafont programming and L^AT_EX 2_ε package writing and T_EXmacro programming (*especially the T_EXmacro programming*) required to produce these symbols looked like it might, itself, never end. It took more than a year of work in fits and starts to understand how the jalousie of bits and pieces go together to make a font work with L^AT_EX. Finally, the first of the symbols is ready. The remaining eight symbols will follow within one month from the time this is approved. The Comprehensive L^AT_EX 2_ε Symbol List (<http://www.ctan.org/tex-archive/info/symbols/comprehensive/>) does not currently include this set, but on completion all of these files will be ready to upload in the correct formats for inclusion. These are implemented as a standard T_EX math symbol font, implemented with custom Metafont sources, rendered on-the-fly as needed by L^AT_EX 2_ε. Symbols are accessed through macros defined in this package.

1. First, you need to find the folder texmf-local. To do that, use this:

```
kpsewhich --var-value TEXMFLOCAL
```

2. This package provides the following four files:

```
esrelation.sty – macro definitions
uesrelation.fd – font description
esrelation10.mf – metafont driver
esrelation.mf – metafont source
```

3. If you've previously installed this package (like you, Byron) then it's time to clean out the old files first and regenerate. You first have to trash the .tfm (font metrics) and .pk (packed bitmap) files. Do that in one command:

```
rm -i
/Users/**youruser**/Library/texlive/2011basic/texmf-var/fonts/
tfm/local/public/esrelation/*
/Users/**youruser**/Library/texlive/2011basic/texmf-var/fonts/
pk/ljfour/local/public/esrelation/*
```

4. Move `esrelation.sty` and `uesrelation.fd` where \LaTeX stores packages. This varies for different distributions but typically is the local directory tree. For example:
`/usr/local/texlive/2011basic/texmf-local/tex/latex/local/public/esrelation/`
5. Put `esrelation10.mf` and `esrelation.mf` where MetaFonts are stored. This varies for different distributions but is most often the local font directory. For example:
`/usr/local/texlive/2011basic/texmf-local/fonts/source/local/public/esrelation/`
6. Next, you need to update your \LaTeX font database. This is called the `ls-r` and lives in a few places. Fortunately, you can just run this, likely as `sudo` or `root`:
`mktexlsr`
7. Open \LaTeX , and start relating.

2 Using esrelation

<code>\relationrightproject</code>	$\overrightarrow{[A, Z]}$
<code>\relationleftproject</code>	$\overleftarrow{[A, Z]}$
<code>\relationlifting</code>	$\underline{[A, Z]}$
<code>\restrictwand</code>	i_{\downarrow}
<code>\restrictwandup</code>	i_{\uparrow}
<code>\restrictbarb</code>	R_{\downarrow}
<code>\restrictbarbup</code>	R_{\uparrow}
<code>\restrictmallet</code>	Z_{\downarrow}
<code>\restrictmalletup</code>	Z_{\uparrow}

$$\overrightarrow{\left| R \right|}$$

$$\overrightarrow{\left| 0,1 \right|}$$

$$\overleftarrow{\left| 0,1 \right|}$$

$$\left| 0,1 \right|$$

$$\overleftarrow{\overrightarrow{\overrightarrow{\left| 1,1 \right|}}}$$

$$\left| x\mathbf{x}>1,\ \mathbf{x}x=0 \right|$$

$$\left| \left| \left| x,X_{\downarrow} \right| \right| \right|$$

$$\overleftarrow{\overrightarrow{\overrightarrow{\overrightarrow{\left| i,R \right|}}}}}$$

$$X_{\downarrow} \, X_{\downarrow}^2 \, X_{\downarrow}^{\infty}$$

$$X_{\downarrow}$$

$$X_{\downarrow}$$

End. Try some more combinations now that it's running.