The **esrelation** Package

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1 Installation

The program termination problem, also known at 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 LaTeX 2_ε package writing and TeXmacro programming (*especially the TEXmacro 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 jalopy of bits and pieces go together to make a font work with LaTeX. The Comprehensive LaTeX 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 TeX math symbol font, implemented with custom Metafont sources, rendered on-the-fly as needed by LaTeX 2_ε. Also provided in this package is a PostScript Type 1 version of the font. Symbols are accessed through macros defined in this package.

Installation involves copying the supplied files to their designated places within LaTeX's search path and updating TeX's databases.

1. First, you need to find the folder `texmf-local` (on Unix the default is `/usr/local/texlive/texmf-local`). To do that, run:

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

   Subsequently, this directory will be referred to as `TEXMFLOCAL`.

2. Run LaTeX on `esrelation.ins`. Copy the files into the following directories, creating subdirectories as necessary:

   - copy `esrelation.sty` and `uesrelation.fd` to:
     `TEXMFLOCAL/tex/latex/esrelation`
   - copy `esrelation.mf` and `esrelation10.mf` to:
     `TEXMFLOCAL/fonts/source/public/esrelation`

   If you also want to install the fonts in Type1 format:

   - copy `esrelation10.pfb` to:
     `TEXMFLOCAL/fonts/type1/public/esrelation`

- copy `esrelation.map` to:
  `TEXMFLOCAL/fonts/map/dvips/esrelation`

Note that all created directories should be set to mode `755` and all files should be set to mode `644`.

3. 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 (`-H` sets `HOME` for the sudo environment):

   ```
   sudo -H mktexlsr
   ```

4. Update your TeX font map by running the command:

   ```
   sudo -H updmap-sys --enable Map=esrelation.map
   ```

5. Update the font database again:

   ```
   sudo -H mktexlsr
   ```

6. Open LaTeX, and start relating.

2 Using esrelation

Load the package with `\usepackage{esrelation}`. Available symbols to be used from math mode:

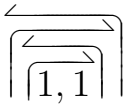
`\relationrightproject`	$\overrightarrow{\lceil A, Z}$
`\relationleftproject`	$\overleftarrow{A, Z\rceil}$
`\relationlifting`	$\underbrace{\lfloor A, Z}$
`\restrictwand`	$i_{\downarrow}$
`\restrictwandup`	$i_{\uparrow}$
`\restrictbarb`	$R_{\downarrow}$
`\restrictbarbup`	$R_{\uparrow}$
`\restrictmallet`	$Z_{\downarrow}$
`\restrictmalletup`	$Z_{\uparrow}$

$\overrightarrow{R_A}$

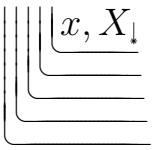
$\overrightarrow{0, 1}$

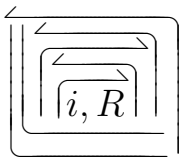
$\overleftarrow{0, 1}$

$\underrightarrow{0, 1}$



$\underrightarrow{x\texttt{x>1, x}x = 0}$





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

$X_{\downarrow}$

$X_{\downarrow}$

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