

## The kuvio package

MikTeX had not installed this package on my computer, but did so from the internet when I ran it on a file requiring kuvio. There is a manual “Typesetting diagrams with kuvio.tex” available on the web.

The package uses specials that are recognized only by dvips, not pdfLatex, and so this file was produced using tex  $\rightarrow$  dvi  $\rightarrow$  ps  $\rightarrow$  pdf. For this file, I loaded using

```
\usepackage[forcekdg]{kuvio}
\arrsy
```

Do not use

```
\usepackage[arrsy]{kuvio}
```

as this produces garbage.

Except that it lacks curved arrows and doesn't automatically stretch arrows to match labels, it is a very capable package.

The syntax is similar to that of `array` (and `diagrams`), as illustrated by:

$$\begin{array}{ccc} A & \xrightarrow{a} & B \\ \downarrow b & & \downarrow c \\ C & \xrightarrow{d} & D \end{array} \begin{array}{l} \backslash\text{Diagram} \\ A \quad \quad \quad \&\backslash\text{rTo}^{\{a\}} \quad \quad \&B\\ \backslash\text{dTo}_{\{b\}} \quad \& \quad \quad \quad \&\backslash\text{dTo}_{\{c\}}\\ C \quad \quad \quad \&\backslash\text{rTo}^{\{d\}} \quad \quad \&D \\ \backslash\text{endDiagram} \end{array}$$

Note that it is necessary to end the last line with `\\`.

Arrows are specified by a one- or two-letter prefix describing the direction, and a suffix describing the body of the arrow. For example:

$\begin{array}{ccccc} \text{lu} & & \text{u} & & \text{ru} \\ & \swarrow & \uparrow & \nearrow & \\ & \text{l} & & \text{r} & \\ & \swarrow & \downarrow & \searrow & \\ \text{ld} & & \text{d} & & \text{rd} \end{array}$	$A \xrightarrow{\text{To}} B$	$A \overset{\text{Nul}}{=} B$
	$a \xrightarrow{\text{Mapsto}} b$	$A \xrightarrow{\text{Two}} B$
	$A \xrightarrow{\text{Into}} B$	$A \overset{\text{Eq}}{=} B$
	$A \xrightarrow{\text{Epi}} B$	$A \dots\dots\dots B$
	$A \xleftrightarrow{\text{Bij}} B$	$A \overset{\text{Line}}{\text{---}} B$

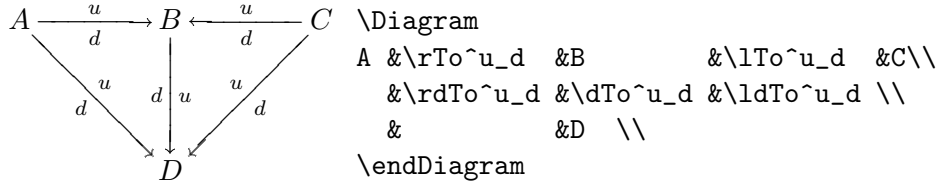
To invoke an arrow, combine the two, as illustrated by:

$$\begin{array}{ccc} A & \xleftrightarrow{\quad} & B & \xleftrightarrow{\quad} & C \\ & & \vdots & & \\ & & \vdots & & \\ & & \vdots & & \\ & & \vdots & & \\ & \searrow & & \swarrow & \\ & & D & & \end{array} \begin{array}{l} \backslash\text{Diagram} \\ A \quad \&\backslash\text{rInto} \quad \&B \quad \quad \&\backslash\text{lInto} \quad \&C \\ \quad \quad \&\backslash\text{rdEpi} \quad \&\backslash\text{dDots} \quad \&\backslash\text{ldEpi} \\ \quad \quad \& \quad \quad \&D \\ \backslash\text{endDiagram} \end{array}$$

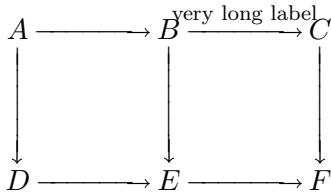
To add labels to arrows, place them as superscripts or subscripts on the arrow (between braces if necessary), as illustrated by:

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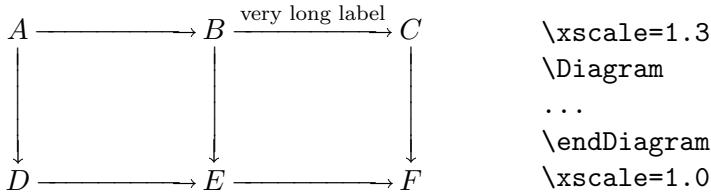
This is part of: Guide to Commutative Diagrams, [www.jmilne.org/not/CDGuide.html](http://www.jmilne.org/not/CDGuide.html)  
September 23, 2010



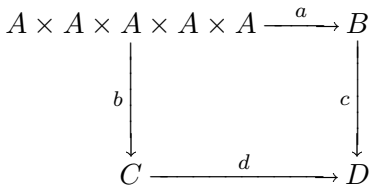
A superscript places the label above (or to the right) of an arrow.  
 Arrows don't stretch to match long labels:



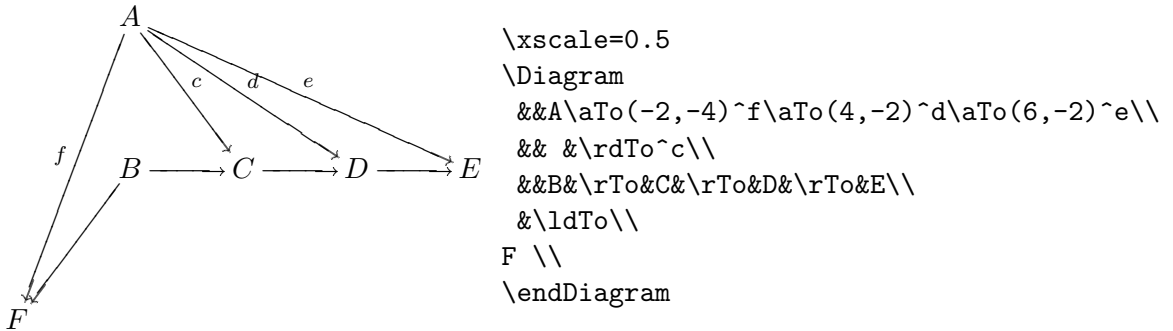
To fix this, scale the diagram in the  $x$ -direction:



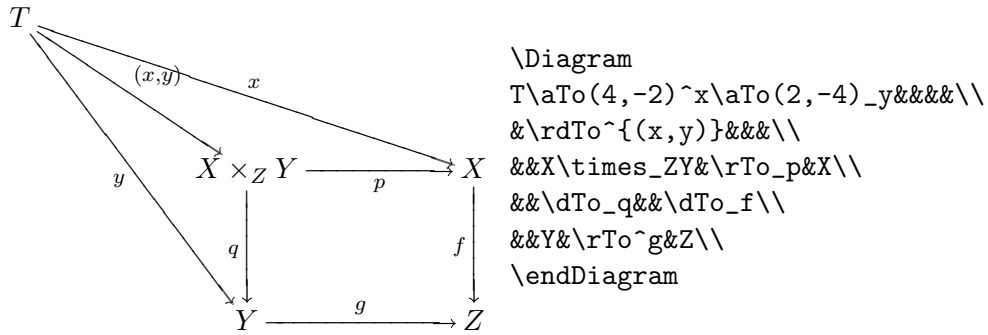
Arrows stretch (or contract) to match large objects but, as in the following diagram, it may be necessary to scale the diagram in the  $x$ -direction.



An arrow that points to an object  $x$  columns to the right and  $y$  rows above is invoked by `\aTo(x,y)`, as illustrated by:



Another example to illustrate the above rules:

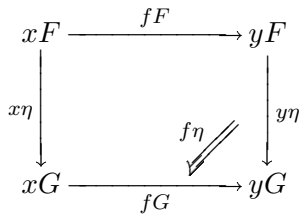


Finally, two examples from the manual.

```

\Diagram
xF & \rTo ^{fF} & yF \\
\dTo <{x\eta} & & \dTo >{y\eta} \\
xG & \rTo _{fG} & yG \\
\Modify
\Para (1.5,.5) <{f\eta} /{-135}
\endDiagram

```



```

\dotted\grid=7mm\yscale=2\Diagrampad=0pt
\Diagram
&&&&&&&xz&&&xyz&&&xy^2z&&&xy^3z \\
\\
z&&&zy&&&zy^2&&&zy^3 \\
\dy{-0.2}
&&&&&&x&&&xy&&&xy^2&&&xy^3 \\
\\
&&&y&&&y^2&&&y^3 \\
\Modify
\Line (0,0) (4,0)\dt{1pt}
\Line (4,0) (8,0)
\Line (8,0) (12,0)
\Line (12,0) (22.5,0)
\Line (0,0) (0,3)\dt{1pt}
\Line (0,3) (0,5.2)
\To (9,2) (12,0)
\To (9,5) (12,3)
\endDiagram

```

