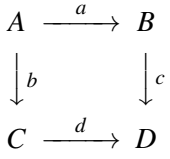
The amscd package

The American Mathematical Society's package `amscd` can produce only rectangular diagrams (no diagonal arrows) and supports only plain labelled arrows and equal signs, but its arrows do stretch to match labels and it is easy to use. Load it with the command `\usepackage{amsmath,amscd}`

Its syntax is illustrated by the following example:



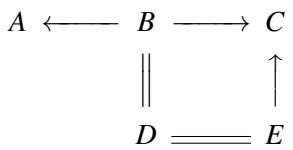
```
\begin{CD}
A     @>a>>  B\\
@VVbV        @VVcV\\
C     @>d>>  D
\end{CD}
```

Rows with horizontal arrows must alternate with those with vertical arrows, and each row except the last must end with `\\`.

The possible arrows (or their replacements) are:

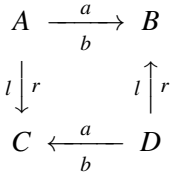
`@<<<`	left arrow	`@>>>`	right arrow
`@AAA`	up arrow	`@=`	horizontal equals
`@VVV`	down arrow	`@|`	vertical equals
`@.`	empty arrow.		

Their use is illustrated by:



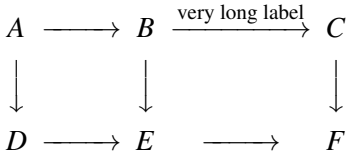
```
$\begin{CD}
A @<<< B @>>> C\\
  @.     @|   @AAA\\
  @.   D @=   E
\end{CD}$
```

Items inserted into the code for the arrows will appear in scriptstyle (the size of sub/superscripts) as labels on the arrows, as illustrated by:



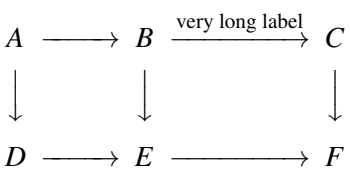
```
$\begin{CD}
A     @>a>b>   B\\
@VlVrV         @AlArA\\
C     @<a<b<   D
\end{CD}$
```

Arrows stretch to match long labels:



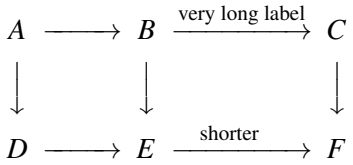
```
$\begin{CD}
A  @>>> B@>\text{very long label}>>C\\
@VVV     @VVV                    @VVV\\
D  @>>> E@>>>                      F
\end{CD}$
```

Notice that the lower arrow doesn't stretch to match the upper arrow. To fix this, add a "phantom" label:

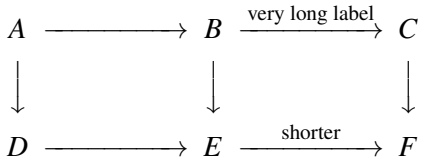



```
$\begin{CD}
A @>>> B @>{\text{very long label}}>> C \\
@VVV @VVV @VVV \\
D @>>> E @>{\phantom{\text{very long label}}}>> F
\end{CD}$
```

To get a shorter label centred on the lower arrow, use the following code:
`@>{\rlap{$\scriptstyle{\ \ \ \text{shorter}}$}\phantom{\text{very long label}}}>>`

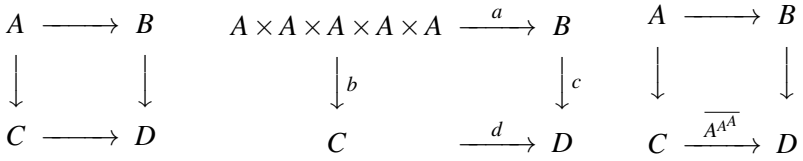


Alternatively, increase the minimum length of a horizontal arrow by replacing the code with
`\[\minCDarrowwidth55pt\begin{CD}...\end{CD}\]`.



This trick also allows you to shorten arrows if necessary to fit a long diagram onto a page.

`Amscd` doesn't handle large objects or tall labels well:

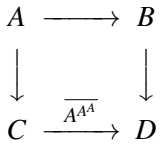


To fix the last problem, add the lines:

```
\newcommand{\tlap}[1]{\vbox to 0pt{\vss\hbox{#1}}}
\newcommand{\blap}[1]{\vbox to 0pt{\hbox{#1}\vss}}
```

to your document, and then write

`C@>\tlap{\scriptsize$\overline{A^{A}}$}>>D`



See `http://tex.stackexchange.com/questions/23845/` for alternatives.