Summary of `qsymbols`

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Abstract

`qsymbols` is a LaTeX [1] package defining systematic mnemonic abbreviations, starting with a single open quote, ‘, for symbols and arrows from the `amssymb` and `stmaryrd` packages. Optionally a very large class of arrows can be typeset using XY-pic [2].

Contents

1 Introduction

`qsymbols` sets up a number of mnemonic and compact abbreviations for math symbols from LaTeX and the packages `amssymb` and `stmaryrd`, which it loads. The abbreviations all start with the backquote character ‘. Some are a single character, some a more complicated pattern, but always the idea is to use abbreviations that hint at the *visual* appearance of the symbol. Finally it is possible for the user to add more abbreviations of the simpler categories.

You can retrieve `qsymbols` as well as the `amssymb` and `stmaryrd` packages by anonymous ftp from all CTAN archives in directory `/tex-archive/macros/latex/contrib/supported/`[1] (each package has its own subdirectory).

The following sections describe the various classes of symbols that are loaded.

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[1] The ‘home’ of `qsymbols` is `ftp.diku.dk` in directory `/diku/users/kris/TeX/`.

2 Simple symbols

2.1 Greek letters

All the standard greek letters used in math are available as ` followed by a letter: either lowercase:

x	a	b	c	d	e	f	g	h	i	j	k	l	m	n	p	q	r	s	t	w	x	y	z
\`x	α	β	χ	δ	ϵ	ϕ	γ	η	ι	ψ	κ	λ	μ	ν	π	θ	ρ	σ	τ	ω	ξ	υ	ζ

or uppercase:

x	D	F	G	J	L	P	Q	S	W	X	Y
\`x	Δ	Φ	Γ	Ψ	Λ	Π	Θ	Σ	Ω	Ξ	Υ

2.2 Common symbols

Simple symbols are available using ` followed by a symbolic representation of the symbol. The most common have single character representations:

x	+	*	:	;	/	U	-	_	o	O	.	=	~	E	A	!	^	V
\`x	$\pm$	$\times$	$\in$	$\notin$	$\setminus$	$\cup$	$\vdash$	$\perp$	$\circ$	$\emptyset$	$\cdot$	$\equiv$	$\sim$	$\exists$	$\forall$	$\neg$	$\wedge$	$\vee$

2.3 Circled and Boxed Symbols

These are represented using round and square brackets, respectively:

x		+	-	\`*	/	|	\`/	\`.	*	\`o	\`^	\`V	<	>	?	!	:-	a
\`(x)	$\bigcirc$	$\oplus$	$\ominus$	$\otimes$	$\oslash$	$\obar$	$\obslash$	$\odot$	$\circledast$	$\circledcirc$	$\owedge$	$\ovee$	$\olessthan$	$\ogreaterthan$	$\circ$	$\bullet$	$\smiley$	$\textcircled{a}$
\`[x]	$\square$	$\boxplus$	$\boxminus$	$\boxtimes$	$\boxslash$	$\boxbar$	$\boxbslash$	$\boxdot$	$\boxast$	$\boxcircle$	$\boxed{\wedge}$	$\boxed{\vee}$	$\boxed{<}$	$\boxed{>}$	$\scriptstyle\square$	$\blacksquare$	$\frownie$	$\boxed{a}$

As it can be seen, 'undefined' codes like `` `(a) `` and `` `[a] `` result in the contents being circled and boxed, respectively.

2.4 Bold symbols

The $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX `\boldsymbol` command is available by using the special abbreviation `` `" ``x for the bold version $\boldsymbol{x}$ of x as well as `` `"` ``x where x is on one of the forms described in this section, i.e., `` `"`a `` gives $\boldsymbol{\alpha}$.

2.5 Adding new symbols

Symbols of all the above forms can be added using the form

`\newqsymbol` {\`*code*} {*expansion*}

which makes \`*code* behave as *expansion* in math mode. `code` should be either a single character or some characters in `()`, `[]`, or `{}`.

3 Orderings

Two to four consecutive \`s indicate an ordering relation.

$\epsilon, \ni$	\`\`ϵ	\`\`/ϵ	\`\`ϵ=	\`\`/ϵ=	\`\`\`ϵ	\`\`\`\`ϵ	\`\`$\ni$	\`\`/$\ni$	\`\`$\ni$=	\`\`/$\ni$=	\`\`\`$\ni$	\`\`\`\`$\ni$
<, >	$<$	$\not<$	$\leq$	$\not\leq$	$\wedge$	$\bigwedge$	$>$	$\not>$	$\geq$	$\not\geq$	$\vee$	$\bigvee$
(,)	$\subset$	$\not\subset$	$\subseteq$	$\not\subseteq$	$\cap$	$\bigcap$	$\supset$	$\not\supset$	$\supseteq$	$\not\supseteq$	$\cup$	$\bigcup$
[,]	$\sqsubset$	$\not\sqsubset$	$\sqsubseteq$	$\not\sqsubseteq$	$\sqcap$	$\bigsqcap$	$\sqsupset$	$\not\sqsupset$	$\sqsupseteq$	$\not\sqsupseteq$	$\sqcup$	$\bigsqcup$
\\{, \\}	$\prec$	$\not\prec$	$\preceq$	$\not\preceq$	$\curlywedge$	$\bigcurlywedge$	$\succ$	$\not\succ$	$\succeq$	$\not\succeq$	$\curlyvee$	$\bigcurlyvee$
\\<, \\>	$\lhd$	$\not\lhd$	$\unlhd$	$\not\unlhd$	$\vartriangle$	$\bigtriangleup$	$\rhd$	$\not\rhd$	$\unrhd$	$\not\unrhd$	$\triangledown$	$\bigtriangledown$
~, \\~	$\sim$	$\not\sim$	$\simeq$	$\not\simeq$	$\wr$		$\backsim$	$\not\backsim$	$\backsimeq$	$\not\backsimeq$	$\smallint$	$\int$
-, \\-	$\vdash$	$\not\vdash$	$\models$	$\not\models$	$\top$		$\dashv$	$\not\dashv$	$=\!\mid$	$\not=\!\mid$	$\bot$	

Some abbreviations are provided for convenience:

x	U	^	V	S	P
\`\`x	$\bigcup$	$\bigwedge$	$\bigvee$	$\sum$	$\prod$

There is no simple way to add more orderings.

4 Arrows

Double quotes `"..."` make it possible to typeset arrows.

4.1 Canned arrows

The available arrows are shown in figure 1. A notation similar to the XY-pic [2] 'arrow' feature notation variant-tail-shaft-tip is used to.

4.2 Adding new arrows:

You can add more 'canned' arrows of this kind with commands

`\newqsymbol {"`*arrow*`"} {`*expansion*`}`

which makes `"`*arrow*`"` behave as *expansion* in math mode.

4.3 Using XY-pic for arrows:

If the option `[xy]` is used in the `\usepackage` command, or if XY-pic [2][2] is already loaded, then the XY-pic arrow feature (with the 'cmtip' extension) is used to allow a much more general class of arrows, constructed according to the following rules (with examples where they extend the notation used for the standard):

- Basic arrows are composed by combining the variants `23^_`, the tips `<>|xo`'`'`, and the connectors `-=.:~`.

[2] XY-pic version 2.12 or later is needed for this to work.

`"<-"`	$\leftarrow$	`"<-!"`	$\longleftarrow$	`"->"`	$\rightarrow$	`"-!>"`	$\longrightarrow$
`"<="`	$\Leftarrow$	`"<=!"`	$\Longleftarrow$	`"=>"`	$\Rightarrow$	`"=!>"`	$\Longrightarrow$
`"<3"`	$\Lleftarrow$			`"3>"`	$\Rrightarrow$		
`"</-"`	$\nleftarrow$			`"-/>"`	$\nrightarrow$		
`"</="`	$\nLeftarrow$			`"=/>"`	$\nRightarrow$		
`"<->"`	$\leftrightarrow$	`"<-!>"`	$\longleftrightarrow$	`"</->"`	$\nleftrightarrow$		
`"<=>"`	$\Leftrightarrow$	`"<=!>"`	$\Longleftrightarrow$	`"</=>"`	$\nLeftrightarrow$		
`"<-|"`	$\mapsfrom$	`"<-!|"`	$\longmapsfrom$	`"|->"`	$\mapsto$	`"|-!>"`	$\longmapsto$
`"<=|"`	$\Mapsfrom$	`"<=!|"`	$\Longmapsfrom$	`"|=>"`	$\Mapsto$	`"|=!>"`	$\Longmapsto$
`"<-'"`	$\hookleftarrow$			``"`->"``	$\hookrightarrow$		
`"^<-"`	$\leftharpoonup$	`"_<-"`	$\leftharpoondown$	`"^->"`	$\rightharpoonup$	`"_->"`	$\rightharpoondown$
`"<--"`	$\dashleftarrow$			`"-->"`	$\dashrightarrow$		
`"<<-"`	$\twoheadleftarrow$			`"->>"`	$\twoheadrightarrow$		
`"<<="`	$\twoheadleftarrow$			`"=>>"`	$\twoheadrightarrow$		
		`"<~>"`	$\leftrightsquigarrow$	`"~>"`	$\rightsquigarrow$		
`"<-<"`	$\leftarrowtail$			`">->"`	$\rightarrowtail$		
				`"-o"`	$\multimap$		
				`"->o"`			
				`"->>o"`			
`"<|-"`		`"<|-|>"`		`"-|>"`			

Figure 1: Standard arrow symbols

- The character `/` 'negates' the arrow (once or twice) similar to the way `\not` does for relations, and the characters `?+*` are used to mark the arrow with a symbol corresponding to the reflexive, transitive, and reflexive transitive, closures:

x	``‘-/>``	`-//>`	`=>?`	``‘->+``	`|-->*`
`"`x`"`	$\hookrightarrow$	$\nrightarrow$	$\overset{\epsilon}{\Longrightarrow}$	$\overset{+}{\hookrightarrow}$	$\overset{*}{\vdash\dashrightarrow}$

- Each `!` character makes the arrow a bit longer.

x	`->`	`-!>`	`-!!>`	`-!!!>`
`"`x`"`	$\rightarrow$	$\longrightarrow$	$\longrightarrow$	$\longrightarrow$

Note: Some arrows are automatically made a bit longer, e.g., the `<~>` arrow shown above.

- The form `{`ℓ`}` adds the ℓ material to the end of the XY-pic arrow. All XY-pic ⟨labels⟩ can be used as described in [2, §16], for example,

x	`-{_1}>`	`={^\sin}!>>`	``={|{‘b}}!!|>``
`"`x`"`	$\xrightarrow[1]{}$	$\overset{\sin}{\Longrightarrow}$	$=\beta\Rightarrow$

Use this with care!

- The forms `(`x`)` and `[`x`]` insert a break with x in a circle/box, respectively:

x	`(1)>`	`[1]>>`
`"`x`"`	$-1\rightarrow$	$-\boxed{1}\twoheadrightarrow$

References

[1] Leslie Lamport. *LaTeX—A Document Preparation System*. Addison-Wesley, 2nd edition, 1994.

[2] Kristoffer H. Rose and Ross Moore. XY-pic reference manual. Mathematics Report 94–155, MPCE, Macquarie University, NSW 2109, Australia, June 1994. For version 2.10+. Latest version available by anonymous ftp in `ftp.diku.dk: /diku/users/kris/TeX/xyrefer.ps.Z`.